GASTRIC JUICE AND THE PREVENTION OF ENTERIC FEVER AND CHOLERA.

By Lieutenant-Colonel N. Faichnie.
Royal Army Medical Corps.

With the commencement of fighting under conditions of temperature such as those at present prevailing in the Dardanelles, I venture to predict that after the usual eight weeks—the so-called eight weeks' phenomenon—there will be a good deal more disease of the enteric group than we have had up to date in France or Belgium.
It is true that our sanitary measures are very complete, but it seems to me that we do not take enough advantage of the power of the gastric juice to act as an antiseptic—a known and admitted fact. Microbial poisons differ from chemical ones in that the former have incubation periods and are much more uncertain in their action, which means, I take it, that the mere swallowing of microbes is of no importance unless they have an opportunity to take root and grow. Let me give as an example an occurrence related in the text-books that has always impressed me very much.

Many years ago, a portion of a cholera stool got mixed up with four gallons of water, and was left to stand in the sun for some hours. Early next morning 19 men each drank an ounce of this mixture, and 5 of them developed cholera; that is to say 14, or 73 per cent escaped entirely, although they must have swallowed enormous numbers of cholera bacilli. It seems probable that in those who escaped, the cholera bacilli, which are well known to be very sensitive to acids, were killed by the hydrochloric acid of the gastric juice.

We may remember that in the Tropics it has long been considered unwise to go out in the morning without eating something first. Also during the fast of Ramazan, when water but no solid food is allowed till sunset, it has been shown that Mahomedans suffer more than Hindus from cholera, although at other times of the year there is no disproportion.

Here, then, we have a principle which seems to be of great importance, viz., that the longer the bacilli of enteric fever and cholera remain in the acid stomach the more likely they are to be killed, and unless they reach the alkaline small intestine alive they can do no harm. The newer physiology teaches us that if water be taken on an empty stomach, it leaves it again almost immediately, also that the clotting of milk in the stomach is a provision of Nature to allow of gastric digestion.

On the other hand, solid food may remain in the stomach for several hours, and leave it slowly, though the observation of bismuth meals shows that the food may begin to move very quickly. Other things being equal, then, it seems probable that the more fluid taken with solid food the more quickly will the latter begin to leave the stomach. As the stomach is said to secrete between eight and ten pints of gastric juice a day (I quote Dr. Alex. Hill), drinking at meals is quite unnecessary.

The following rules, therefore, may safely be laid down:—

(1) For drinking. If the water is above suspicion, or if tea is available, the best time to drink is before meals, in the same way that a horse is watered before being fed. This will supply the body with fluid, and at the same time will leave the stomach comparatively dry for the reception of food.

(2) On the contrary. If the water is not above suspicion never drink it on an empty stomach, as it will pass on almost immediately and penetrate to the small intestine.
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(3) If there is nothing but suspicious water to drink, take it in small quantities at a time, and then at least twenty minutes after a meal—the bigger the meal the safer it is to drink—but always drink slowly, so that each small amount taken gets well mixed with the acid of the gastric juice.

As regards eating. Bread issued once in twenty-four hours, and always liable to pollution by dust, or flies, or handling, is, I consider, the most dangerous part of a ration. The drier it is when eaten the longer it will remain in the stomach, and the less diluted will the acid or the gastric juice become. A large drink of even a safe fluid will dilute the gastric juice proportionately, and may also wash down microbes into the small intestines before there has been time for them to be killed.

Just before the War broke out I had arranged to make some experiments in order to try and get bacteriological evidence in favour of these statements, but I was unable to carry them out. As the statements stand, they may be of some value, and considering the good water discipline of some regiments, it should not be difficult to carry out the principle.

MALIGNANT ENDOCARDITIS AS A COMPLICATION OF EPIDEMIC CEREBROSPINAL FEVER.

By LIEUTENANT W. WRIGHT MACKARELL.
Royal Army Medical Corps.

Amongst the complications of epidemic cerebrospinal fever malignant endocarditis is not mentioned in the current literature, so that the two cases about to be described are apparently unique. They both occurred in the late epidemic and strangely enough were together in the same ward. The one, the first, was diagnosed several weeks before it proved fatal, but the other, for reasons which will be explained later, was not recognized until the post-mortem.

Case 1.—F. W., aged 19, soldier, previously quite healthy, was admitted to hospital on February 20, 1915. He complained of violent headache; he had a foul tongue, Kernig's sign was well marked, there was no rash and no head retraction. His temperature was 99° F., which later went to 101° F.; his pulse was 104. On the following day there was a slight subcuticular haemorrhagic rash; he was lumbar-punctured and twenty cubic centimetres of Burroughs Wellcome and Co.'s antimeningococcic serum injected into the spinal canal. The fluid drawn off was turbid, and smears showed large numbers of polymorphonuclear leucocytes, and a very few Gram-negative intracellular diplococci, which on culture failed to grow. Following the lumbar puncture the temperature fell to 98° F., the pulse to 66, and the patient felt much better. The following day