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**Observations on the effects of fasting upon the opsonic power
of the blood to staphylococcus aureus.**

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During the last year considerable work has been done in demonstrating the part that is played by opsonins in protecting the body from diseases, also in pointing out how the protective power of the body against certain bacteria can be accurately determined. The physiologists have frequently hinted that diminished nutrition lays the human body open for a ready invasion by micro-organisms, but they have not been able to support their views by actual figures. If we remember aright, at the last meeting of the British Medical Association at Toronto, Professor Chittenden referred to this matter and to the lack of absolute data, although we do not find that his remarks are included in the official report of the discussion in question.

One of us (M.), previous to entering as a medical student, had found that he could fast without serious result over a period of several days. Now, as a third year medical student, he decided that he was in favorable surroundings to undergo another fast during which observations upon metabolism might be taken. The results upon metabolism have been investigated by others. Here we desire to call attention to the effects of fasting for a period of nine days upon the opsonic power of the blood.

M. is a sturdily built young adult, twenty-eight years of age, who weighed before the fast one hundred and thirty-nine pounds and whose height is five feet and three-quarter inches. He had always enjoyed good health.

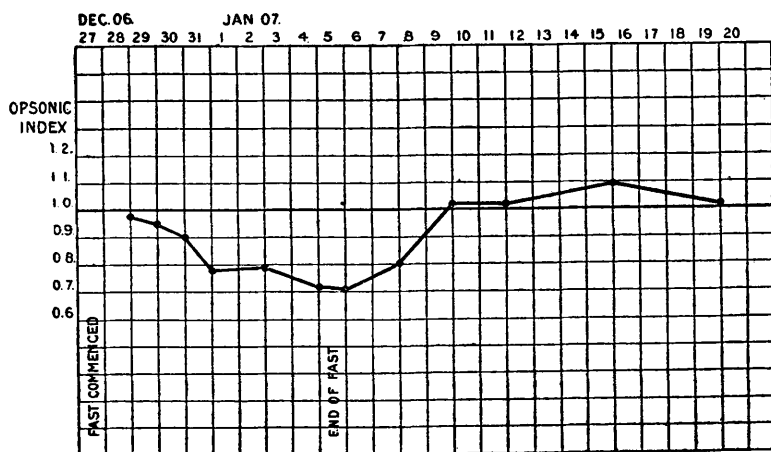
The fast began after a meal at 9 a. m. on December 27, and continued until 6 p. m., January 5. During this time M. did not suffer from boils or any infection which could have affected the results obtained in these observations. He was not at rest during this experimental fast but took daily exercise, frequently walking five miles and was up and about most of the day. He took water

to the amount of 200 cc. three times a day, but absolutely no food. At the conclusion of the fast his weight was one hundred and twenty-five pounds, a loss of fourteen pounds.

Unfortunately the fast had already begun when the other of us (R) was asked to make opsonic investigations. The first observation was then made on December 28th, thirty-six hours after the fast had started; the blood was taken at 8:30 p. m. From this date onwards observations were made daily, except on January 1st and January 3rd. The blood was drawn at the same hour each day (10 a. m.); on the last day, however, the blood was examined at 4 p. m., shortly before the conclusion of the fast.

After the fast the blood was examined five times over a period of two weeks. The blood was taken in the afternoon. An eighteen-hour culture of staphylococcus upon plain agar was used for the preparation of the emulsion. This organism was used on account of the fact that with it accurate results can be obtained and also on account of the fact that we were somewhat unprepared for the work which we took up hurriedly at a few hours notice. The control serum was that of an individual whose opsonic power had been shown (by pool) to be normal to this organism. The technique employed was that of Wright and Douglas.

The accompanying diagram gives a clear picture of the result obtained.



Examination of the curve shows that over the period of the fast there was a gradual diminution of the opsonic power till finally at the end of the fast, on the ninth day, it was 0.7.

We do not lay stress upon the small differences shown between some of the successive observations but we consider that the difference between 0.98 and 0.7 is absolutely definite.

We would call attention to the steady rise to and retention at the normal after the fast was broken.

We fully realize that a sweeping statement regarding the variations in the resistance of the body cannot be made from our observations on the opsonic power against staphylococcus aureus ; nevertheless, it is of interest that a decided fall in the power did occur against this organism. Moreover, if we take it that the natural opsonins which exist in the body are general and not specific, it would not seem unlikely that the phagocytic index against other organisms could be shown to be diminished correspondingly.

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The automatism of the respiratory center.

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In the course of observations on the resuscitation of the central nervous system we have had the opportunity to determine whether regular, spontaneous respiratory movements can be discharged at a stage in the resuscitation when as yet the respiratory center is unaffected by stimulation of afferent nerves. The respiratory movements, and usually the arterial blood pressure as well, were recorded and the effect of stimulation of the central ends of the vagus, brachial plexus and sometimes the sciatic determined before occlusion of the arteries supplying the brain, the bulb and the upper portion of the cervical spinal cord. These arteries (innominate and left subclavian proximal to the origin of the left vertebral) were then occluded by temporary ligatures. At intervals during the occlusion and again after releasing the vessels the nerves were stimulated, of course with the same strength of stimulus as before. Artificial respiration was kept up from the time when natural res-