ously and intraperitoneally) and daily counts made of the white blood cells. No changes in the white blood cells were found in these experiments. It must be admitted, however, that the amounts of bile, which we were able to give experimentally, are probably considerably less than would be absorbed as the result of such ligations as were described above. Nevertheless, if the change in monocytes is produced solely as the result of the absorbed bile, we would expect at least a slight increase in such experiments. Therefore we feel justified in concluding that the more probable explanation is that the change in the blood picture is brought about either directly as the result of the liver injury or indirectly by some interference with the metabolic activities of this organ.

[1] Jones, C. M., and Minot, G. R., *Boston Med. and Surg. J.*, 1923, clxxxix, 531.
[2] Sabin, F. R., *Johns Hopkins Hosp. Bull.*, 1921, xxxii, 314.

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Temperature Effects on Liver as a Result of Lowering Intragastric Temperature With Ice-Water.*

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Considerable work has been done in determining intragastric temperature under various conditions, but comparatively little attention has been paid to the liver. The following experiments were undertaken to determine the immediate temperature effect on the liver following the introduction into the stomach of water at a temperature of 3° C. Dogs were used for the purpose of these experiments and after having been starved for 20 hours were subjected to the following procedure.

Under ether anesthesia the abdomen was opened and thermometers placed as follows: one in the quadrate lobe of the liver, one suspended in the fundus of the stomach cavity, one inserted into a pocket in the stomach wall between the muscularis and the submucosa (except in dog number one this was not done) and of course a thermometer placed in the rectum at the time the anesthetic was started.

In order to introduce the ice-water directly into the stomach cavity a glass tube with the necessary rubber attachments was in-

* This paper was received too late to be put in regular order.

serted near the cardiac end. The work was carried out at room temperature, in this case between 30° C. and 31° C., no artificial means being employed to maintain the body heat of the animals.

Temperature readings were taken every 30 seconds for a period of half an hour. The results are readily portrayed in the graphs and may be summarized as follows:

Group No. 1, 500 cc. of water. Dogs Nos. 2, 3, 4, 5, 6.

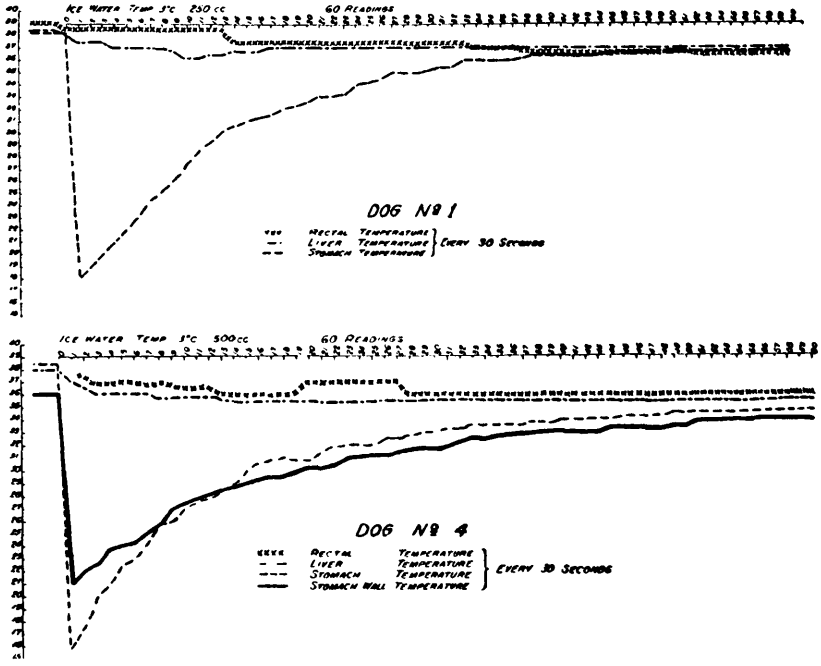
Average drop in rectal temperature	2.45° C.
Average drop in liver temperature	2.25° C.
Average drop in stomach cavity temperature	16.04° C.
Average drop in stomach wall temperature	10.55° C.

Group No. 2, 250 cc. of water. Dogs Nos. 1, 10, 11, 12.

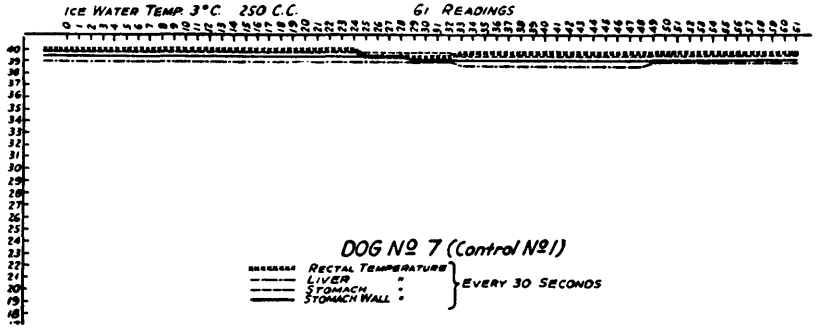
Average drop in rectal temperature	1.08° C.
Average drop in liver temperature	1.16° C.
Average drop in stomach cavity temperature	15.75° C.
Average drop in stomach wall temperature	6.0° C.

Control Group No. 3, no water. Dogs Nos. 7, 8, 9.

Average drop in rectal temperature	.08° C.
Average drop in liver temperature	.08° C.
Average drop in stomach cavity temperature	.08° C.
Average drop in stomach wall temperature	.08° C.



It will be observed that the operative procedure plus the anesthetic had practically no effect whatever on the body temperatures. Dog No. 7, being control No. 1, shows a very slight drop about half way through the experiment. The other two controls show a slight rise.



From the graphs it will also be seen that in dogs 2, 3, 4, 5, 6 and 11 the temperature of the stomach wall registers lower than the temperature of the stomach cavity. This is probably a local temperature manifestation resulting from an interference of the blood supply incident to making the pocket in the stomach wall for the registration of the stomach wall temperature.

The question arises, what will be the effect on the functional activity of the liver as a result of lowering the liver temperature? To that end it is intended to carry out a series of experiments to measure the bile flow under normal and abnormal conditions.

Conclusion. The liver temperature is affected by lowering the intragastric temperature with ice-water.