The factor of secretion into the stomach as an influence on the amount of absorption can be ruled out, for it has been shown[5] that there is normally very little secretion in response to filling the stomach with water, and that even very severe anoxemia has but little influence on the small amount of secretion which is present.

As a further check on the importance of the blood supply to gastric absorption the control part of the experiment was repeated in 11 freshly killed animals. The average amount of absorption in these animals was 6.3%, a figure closely comparable with the normal figure for living animals.

In view of these findings, and since very severe degrees of anoxemia failed to influence the amount of absorption by the stomach we feel that some other factor than the venosity of the blood supply must be of prime importance in the failure of the stomach to absorb water.

Summary. Barbitalized cats and dogs were subjected to various degrees of anoxemia, the most severe being a partial pressure of oxygen of 53 mm. of mercury. This causes a distinct increase in the venosity of the blood. It was found that no degree of anoxemia compatible with life could have any appreciable influence on the amount of absorption from the stomach. It was also found that about as much water is absorbed from the stomach of a dead animal as from that of a living one.

From our findings, and related evidence from other workers previously quoted, it is concluded that some other factor than the venosity of the blood is of chief importance in the failure of the stomach to absorb water.

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Hepatic Circulation Time in Unanesthetized Dogs.

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No report on the rate of blood flow through the liver in unanesthetized dogs has been found in the literature. Since we have had available a number of animals angiostomized according to the tech-

[5] Sleeth, C. K., and Van Liere, E. J., PROC. SOC. EXP. BIOL. AND MED., 1937, **36**, 208.

nique of London,[1] with cannulae on the hepatic and portal veins, we have determined circulation time by the cyanide method.

Our experience with the angiostomy technique has been discussed elsewhere.[2] We have had little difficulty in preparing the animals so that satisfactory injections could be made into the portal and hepatic veins. The time required for KCN injected into either vein to reach the carotid sinus was determined by recording respiration with a pneumograph strapped to the chest, the arrival of the cyanide at the carotid sinus being indicated by the first increase in respiratory excursion. The dogs, previously accustomed to lying quietly during the withdrawal of blood, were held gently on a table with the pneumograph in place until respiratory rate and amplitude were constant. The long needle, attached to a syringe containing the cyanide, was passed down the London cannulae into the vein and the respiration again watched for a short period. Making sure the animal was quiet, the KCN was injected and the time marked on the drum. The increase in respiration was usually abrupt after injection into the hepatic vein and gradual after portal injection. But in no case was it difficult to determine the onset of respiratory stimulation. Typical results are illustrated by Fig. 1.

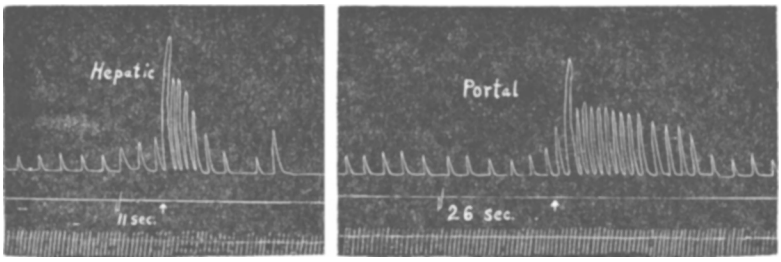

FIG. 1.
Injection of 1 mg. of KCN into hepatic vein, 3 mg. into portal. Normal unanesthetized dog. Respiration recorded.

The difference between the time required for respiratory stimulation after intra-portal injection and that required after intra-hepatic injection was taken as the hepatic circulation time. The results are summarized in Table I. It was necessary to inject from 3 to 6 mg. of KCN into the portal vein to obtain a response, as compared with one mg. in the hepatic. This may in part be due to distribution of the cyanide over a larger volume of blood by passage through the vascular bed of the liver, and in part to diffusion of the cyanide

[1] London, E. S., *Angiostomie u. Organestoffwechsel*, Moscow, 1935.
[2] Cherry, I. S., and Crandall, L. A., Jr., *Am. J. Physiol.* To be published.

TABLE I.

Hepatic Circulation Time in Unanesthetized Dogs.

H—Seconds elapsing between injection of 1 mg. KCN into hepatic vein and respiratory response.

P—Same for 3 to 6 mg. KCN into portal vein.

C.T.—Hepatic circulation time in seconds (P-H).

	Normal Dogs						Adrenal Denervated Dogs		
	1	2	3	3	4	5	1	2	3
P.	26	16	13	24	20	30	17	26	29
H.	8	11*	6	12	7	7	10	10	12
C.T.	18	5	7	12	13	23	7	16	17
	Treated Depancreatized Dogs						Hypophysectomized Dogs		
	1	1	2	2	3		1	2	3
P.	14	16	24	23	20		18	22	24
H.	6	7	11	10	8		8	10	12*
C.T.	8	9	13	13	12		10	12	12

*Injection made in leg vein instead of hepatic.

from the liver capillaries. It is also suggestive of a detoxifying action on the part of the liver. It is significant that 6 mg. of KCN were usually required when injected intra-portally in normal dogs, while respiration was as a rule stimulated by 3 mg. of KCN injected into the portal in depancreatized dogs. It is not improbable that there was some interference with liver function in the hypophysectomized and depancreatized animals, even though the latter were maintained on insulin and raw pancreas.

Since all values for hepatic circulation time in the operated animals are well within the limits of variation found in the normals it appears that adrenal denervation, pancreatectomy, or hypophysectomy did not appreciably change the rate of blood flow through the liver in these dogs. A conclusive statement concerning the effect of these surgical procedures should await determinations on a larger series of animals. But it may be pointed out that the average for the normal group is 13 seconds, that for the whole series 12 seconds.

The variations in rate of blood flow in the normal animals are comparable to the variations that we have observed[2] in fasting glucose output from the liver in such dogs, although no relationship between blood flow and glucose output can be assumed until parallel determinations are made.