the method of Folin and Wu.[5] The diet of the normal pigeon consisted of a commercial chicken feed mixture, while the polyneuritic pigeons received autoclaved grain as long as they would eat it voluntarily. It was then necessary to use forced feeding, 20 grams of the synthetic lard diet of Suguira and Benedict[6] being given each day.

The results of the blood sugar determinations are given in the following table:

TABLE I. Blood Sugar of Pigeons.

	Milligrams of Glucose	Means
Normal	186.9, 187.7, 186.0, 176.2, 198.0, 215.0, 206.1.	193.7
Polyneuritic	241.0, 263.1, 421.0, 422.0, 316.0, 412.3, 555.0, 482.0, 312.5, 296.2, 336.1.	368.7

As is brought out in the table the polyneuritic pigeons show an unmistakable hyperglycemia. The average blood sugar of the polyneuritic pigeon being almost double that of the normal.

[1] McCanison, "Studies in Deficiency Diseases." 1921. London.
[2] Funk, C., and von Shonborn, V., *J. Physiol.*, 1914, xlviii, 328.
[3] Funk, C., *J. Physiol.*, 1919, liii, 247.
[4] Eggleton, P., and Gross, L., *Biochem. J.*, 1925, xix, 633.
[5] Folin, O., and Wu, *J. Biol. Chem*, 1920, xxxviii, 81.
[6] Suguira, K., and Benedict, S. R., *J. Biol. Chem.*, 1923, lv, 33.

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An Undescribed Bile-Expelling Mechanism in the Guinea Pig.

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The anatomy of the extra-hepatic biliary system in the guinea pig is in general similar to that in other laboratory mammals, but that it possesses certain peculiar features. The system consists of hepatic ducts, gall-bladder, cystic duct and common bile duct; but the latter terminates in a dilatation, or ampulla, which is closely applied to the surface of the duodenum on its postero-superior aspect and is situated about 7 to 10 mm. beyond the pylorus. From near the distal end of this ampulla there arises a small duct which passes directly through the duodenal wall and terminates at the head of a papilla.

We have observed the functioning of these structures immediately after killing and in animals under barbital anesthesia. On turning up the liver we have always found the system distended with bile in both fed and fasting animals; in this condition its walls are translucent. During the observations the parts were kept moist with warm normal saline. With each peristaltic wave in the duodenum a constriction is initiated in the common duct just above its junction with the ampulla, obstructing the duct lumen, and this is followed by a contraction of the ampulla which completely empties it of its contents. After the wave has passed, both sphincter and ampulla relax; the ampulla then gradually refills with bile in about 20 seconds to 1 minute, the rate depending on the existing tension in the gall-bladder and hepatic ducts. This cycle of events is repeated with the next peristaltic wave, the sphincter and the ampulla always contracting powerfully. Movements of the duodenum other than regular peristalsis were never accompanied by contraction of either sphincter or ampulla.

Faradic stimulation of the first part of the duodenum elicited a localized contraction without causing contraction of either sphincter or ampulla. Direct stimulation of the ampulla, if effective, always caused contraction of the sphincter also, whereas weak stimulation of the sphincter might be effective without inducing contraction of the ampulla. Repeated stimulation of the ampulla, alowing it to refill in the intervals, resulted in gradual emptying of the gall-bladder when the hepatic ducts were obstructed. We have never seen spontaneous contractions of the gall-bladder although slight changes in shape have been observed. Stimulation of the gall-bladder itself always gave rise to a localized contraction of its wall. We have also observed that a sudden increase of tension in the ampulla, produced by pressure on the gall-bladder, never gave rise to contraction of the sphincter or the ampulla.

Serial sections have shown that there is little, if any, plain muscle in the wall of the common duct itself until near its junction with the ampulla. Here a thick band of circularly disposed muscle fibers is seen, corresponding exactly in position to the sphincter mentioned above. This muscle is prolonged downwards over the ampulla and clothes it with a well marked circular coat, which, however, is not as thick as that of the sphincter. There is also a thin outer longitudinal muscle coat over the sphincter and ampulla, which is apparently continuous with the corresponding layer of the duodenal wall and passes directly, together with the serosa, from one to the other. Where the ampulla and the duodenum are in contact their circular

muscle layers meet as a solid band without any apparent separation. Near the distal end of the ampulla a small funnel shaped opening leads into a short *direct* duct, terminating at the head of the bile papilla (which is formed chiefly by a thickening of the duodenal mucosa). The musculature of the dividing wall between ampulla and duodenum thins out as it approaches the papilla and eventually disappears in the substance of the latter; although the fibers in this region are arranged sphincter-wise, they are very sparse and do not give the impression of a powerful sphincter.

It thus appears that the guinea pig possesses a specialized form of bile-expelling mechanism, in which an ampulla by active contraction discharges its contents directly into the duodenum with the occurrence of each peristaltic wave; regurgitation into the common duct is prevented by the simultaneous contraction of a powerful sphincter. These observations are of interest in view of the fact that, while the gall bladder possesses some degree of contractility, the flow of bile is not at all dependent upon its powers of contraction. The anatomical arrangement described would appear to be a variation of the usual oblique course of the intra-mural portion of the common duct in most other mammals. It is possible that the ampulla, though lying practically outside the duodenal musculature, is in reality homologous with the true Ampulla of Vater.

This is a preliminary report.

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The Effect of Emotion on the Basal Metabolism.

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The experiments here reported were undertaken as part of a study on the relation of the nervous symptoms and the basal metabolism in exophthalmic goiter. There is evidence that these two may not be manifestatons of the same disturbed function.[1]

Twelve hospital patients in the surgical ward for various disturbances, and with varying degrees of emotional reaction were told that they would be operated on the following morning. No drugs were given. The basal metabolism had been studied and was also done the day before operation. On the morning of operation, metabolism was again taken before the patient left for the operating room. In