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Pituitary Extract and the CO₂ Combining Power of the Blood Plasma.**WILLIAM B. DRAPER AND ROBERT M. HILL.**

(Introduced by Robert C. Lewis.)

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It has long been known that the injection of pituitary extract results in a marked rise in the level of the blood sugar. For this and other reasons the posterior lobe of the pituitary gland has been credited with some obscure rôle in carbohydrate metabolism. Such a physiological action on the part of extracts of the gland would appear to suggest a related action on the CO₂ combining power of the blood plasma and possibly on other properties and constituents of the blood. This problem is now under investigation in our laboratories.

Three typical experiments are given in the accompanying table. From Experiment No. 4, it will be seen that the intravenous injection of commercial pituitary extract is followed immediately by a marked fall in the CO₂ combining power of the blood plasma. In this experiment the extremely low level of 21.5 volumes per cent was reached in 10 minutes. Sixty minutes following the injection, the CO₂ combining power had risen to 40.9 volumes per cent. In view of the great rapidity of this fall it does not seem likely that ketogenesis is a factor.

The distribution of this acidosis-producing hormone between "Pitocin"* and "Vasopressin" has been determined. Reference to the table, Experiment 13, shows that the power to produce a fall in CO₂ combining power and a rise in the blood sugar is present in the preparation "Pitocin" which contains less than 1% of the normal pressor activity. This action, although similar, is not so marked as that possessed by "Vasopressin", a preparation which is nearly free from oxytocic activity. The hormone in pituitary extracts which produces this acidosis and rise in blood sugar is, therefore, in all probability, chemically separate from both the pressor and oxytocic hormones.

Our experiments have not at this time progressed sufficiently far to indicate whether this hormone is identical with or separate from the diuretic-antidiuretic hormone.

* Furnished by the courtesy of Parke, Davis & Co.

TABLE I.
Changes in glucose of the blood and CO₂ combining power of the blood plasma after intra-
venous injection of pituitary extract in normal dogs.

	Time after injection	0					10 min.		20 min.		35 min.		60 min.		
		3.2 cc. Commercial Pituitary Extract		Glucose, mgm. % CO ₂ , vols. %		47.2		21.5		24.7		30.8		40.9	
Experiment No. 4 Dog 15 kg.	3.0 cc. "Pitocin"	83		139		156		124		99					
Experiment No. 13 Dog 15 kg.	1.9 cc. "Vaso- pressin"	51.7		38.5		43.8		45.4		48.5					
Experiment No. 10 Dog 22 kg.		87		178		167		148		106					
		45.2		24.1		22.4		26.4		35.0					

Pituitary extract has a wide vogue in the treatment of surgical shock. Since a considerable degree of acidosis is frequently a factor in this condition, the administration of pituitary extract is obviously contraindicated.

Further work on this problem is in progress.