The fall, in pH, carbon-dioxide tension, serum bicarbonate and total acid, indicates that the bilaterally operated animals showing marked symptoms of adrenal insufficiency were suffering from an uncompensated non-volatile acidosis. This seems to be due to an increase of phosphoric and organic acids. In the early stages of adrenal insufficiency the acidosis is of the compensated type.

[1] Peters, J. B., Bulger, H. A., Eisenmann, A. J., and Lee, C., *J. Biol. Chem.*, 1926, lxvii, 141.

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The Influence of Pituitrin Administration upon Certain Phases of Carbohydrate Metabolism.

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Cushing[1] and coworkers have demonstrated that the injection of extracts of the posterior lobe of the pituitary gland results in a lowering of the tolerance for carbohydrates. The purpose of this investigation was to seek further information concerning the mechanism involved in this well known action of pituitrin.

We have made a comparison of the response to intravenous glucose administration in 6 dogs with and without the injection of pituitrin. Glucose was injected intravenously by means of a Woodyatt pump, for a period of 2 to 3 hours, at the rate of either 1.8 or 4 gms. per kilo body weight per hour. A continuous intravenous administration, of approximately .05 cc. of commercial pituitrin (Parke Davis and Co. or Eli Lilly and Co.) per kilo body

TABLE I.
Average Blood Sugar Values.

	4 gm. glucose per kg. hr.		1.8 gm. glucose per kg. hr.	
	Without Pituitrin	With Pituitrin	Without Pituitrin	With Pituitrin
Before injection	0.101	0.095	0.079	0.102
15 min. after injec. began	0.283	0.523		
30 min. after injec. began			0.231	0.315
1 hr. after injec. began	0.492	0.673	0.269	0.350
2 hrs. after injec. began	0.400	0.885	0.239	0.330
15 min. after injec. ended	0.218	0.472		
30 min. after injec. ended.			0.076	0.134

weight per hour, was made by means of a device similar to that described by Burn and Dale[2]. The method employed for studying the response was the same as previously described.[3]

Each animal receiving pituitrin showed a greater hyperglycemia (Table I) and a greater glycosuria than was observed in control experiments on the same animal. This effect was noted early in the course of the experiments, and was not more marked at the end of the period. The animals, receiving glucose at the rate of 4 grams per kilo per hour, excreted 18.1 per cent of this amount in the urine, as compared to 36.5 per cent for the same animals with glucose and pituitrin. When the injection rate was 1.8 gms. the per cent excreted was 10.7 and 25.6, respectively. The concentration of glucose in the urine was unaffected by pituitrin. Studies, made on the plasma pH and CO_2 content, indicated that pituitrin injection caused no appreciable change in the acid base balance of the blood.

TABLE II.

Average R. Q. and Calories per sq. meter Body Surface Area.

	R. Q.		Calories	
	Without Pituitrin	With Pituitrin	Without Pituitrin	With Pituitrin
Before injection	0.79	0.81	*40.7	*35.7
1 hr. after injec. began	0.99	1.00	59.5	60.2
2 hrs. after injec. began	0.96	0.89	58.5	62.7
3-5 hrs. after injec. began	0.83	0.87	39.2	44.8

* Because of the conditions of the experiments these values are to be considered as preliminary rather than basal.

Respiratory data (Table II) indicate that pituitrin has been without influence on the quantity or quality of the oxidative processes during glucose administration. The glucose injection was accompanied by a slight elevation of body temperature, a slight increase in pulse rate, and no change in respiration. The experiments with glucose and pituitrin administration show either no change or a slight fall of body temperature, a slowing of the pulse and somewhat accelerated respiration.

These results indicate that pituitrin has decreased the rate of removal of glucose from the blood by the tissues and that this has not been caused by acid base changes in the blood, or influenced by an altered kidney function. The quantity of glucose disposed of by oxidation was unaltered. The finding of a decreased pulse rate suggests that circulatory changes may be an important factor. Our

results are, however, not opposed to an antagonistic action between insulin and pituitrin.[4]

[1] Goetsch, E., Cushing, H., and Jacobson, C., *Bull. Johns Hopkins Hosp.*, 1911, xxii, 165.

[2] Burn, J. H., and Dale, H. H., *J. Physiol.*, 1924, lix, 164.

[3] Boyd, J. D., Hines, H. M., and Leese, C. E., *Am. J. Physiol.*, 1925, lxxiv, 656.

[4] Burn, J. H., *J. Physiol.*, 1923, lvii, 318.

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Placental Transmission. IV: The Protein Fractions in Fetal and Maternal Plasma.

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The total protein and its albumin, globulin, and fibrin fractions were determined by the method of Wu in the plasmas from 15 mothers and infants, the blood specimens having been obtained at the time of birth.

The total protein in the fetal plasma was uniformly lower than in the maternal plasma, the average difference being 1.00 gram per cent. In maternal plasma, the albumin content was higher than in the fetal specimen in all but two instances. Serum globulin was always higher in the mother. The fibrin content of the maternal plasma was uniformly greater than that of the fetal plasma, the average figure for the former being 0.44 gram per cent and that for the latter 0.27 gram per cent. The plasma of the parturient woman contains less total protein and less albumin than does that of non-pregnant women, whereas the globulin is approximately the same and the fibrin is considerably increased during the latter part of pregnancy. The albumin, globulin, and fibrin percentages of total plasma proteins were strikingly constant in the various bloods, irrespective of the differences in their total protein content.

It was suggested that perhaps the excess of protein in the maternal blood compensates for the higher concentration of certain crystalloid substances in the fetal plasma, so that equal osmotic pressures may obtain on the two sides of the placental barrier.

The low fibrin values in fetal plasma may be related to its diminished viscosity, and to its lowered surface tension, as well as to the slower clotting time of fetal blood and to the increased stability of the fetal red cells.