

pregnancy toxemia.<sup>2</sup> (Case 21.) Conversely, a drop in the level of oestrin has been demonstrated following the administration of A.P.L. to cases of threatened miscarriage.<sup>5</sup> These findings might be interpreted as indicating a mutually antagonistic reaction between A.P.L. and oestrin, and the lack of oestrin in cases of chorioepithelioma may be due to the inhibition or destruction of this hormone by tremendous amounts of A.P.L.

In Table II the A.P.L. and oestrin contents of 4 placentas from pregnancies interrupted between the 2nd and 6th months are compared with those of a hydatidiform mole. The same methods of extraction were employed as those described in the analyses of term placentas.<sup>6</sup> There was a marked excess of A.P.L. in the mole but oestrin was not demonstrable.

These few results do not prove that oestrin may never be present in larger amounts in the blood and urine of cases of chorioepithelioma and mole. In female cases in which there are associated luteal cysts that may contain as high as 10,000 m.u. of oestrin per liter of fluid,<sup>7</sup> one would certainly expect increased amounts in the blood and urine, but even then the tumor would not be the source. At autopsy our Case 1 did not have cystic ovaries. The data presented indicate that the chorionic cells themselves, when they become neoplastic, do not contain oestrin in amounts comparable with those in the normal placenta.

## 7883 P

### An Analysis of Rate and Amplitude of Breathing.

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Gaseous mixtures of low oxygen content following double vagotomy in the dog produced an augmentation of tidal air with little or no change in rate of breathing. After carotid gland denervation and section of the pulmonary branches of the vagus nerve, which leaves the chemically sensitive aortic nerve endings intact, the effects of anoxemia are similar, but not as great as those following double

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<sup>5</sup> Smith, G. V., and Smith, O. W., *J. Am. Med. Assn.*, 1931, **97**, 1857.

<sup>6</sup> Smith, G. V., and Smith, O. W., to be published in *Surg., Gyn. and Obst.*, 1935.

<sup>7</sup> Siegmund, H., *Wien. klin. Wchnschr.*, 1931, **44**, 1045.

cervical vagotomy. With the vagus nerves intact and the carotid glands denervated, anoxemia augmented respiratory rhythm with little or no change in tidal air. Frequently the amplitude of breathing diminished. (See Figs.)

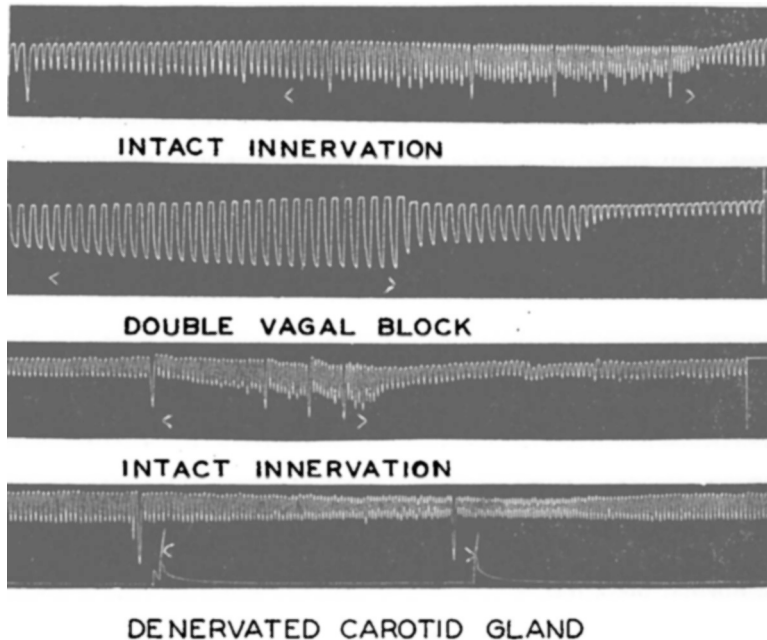


FIG. 1.

In the first and third records, administration of a 4% oxygen mixture to a dog with intact innervation produced the usual results of increased rate and amplitude of breathing. In the second record, during double vagal block and intact carotid gland innervation, similar gaseous administration produced primarily an increased amplitude of breathing. The final acceleration and decreased amplitude is due to deblocking of the vagi during the period of recovery when the animal is breathing room air. In the last record after denervation of the carotid gland, anoxemia produced an increased rate accompanied by a decrease in amplitude. The periods of low oxygen administration extend between the arrow points.

Such results indicate that peripheral chemical stimulation at the carotid gland and at the endings of the aortic nerve contribute importantly to the control of depth of breathing, and that the vagus nerves contribute importantly to the control of rate of breathing. While a differentiation of rate and depth of breathing appears to have been demonstrated, it is not suggested that rate and amplitude control occur exclusively through these 3 channels of nervous influence, for breathing can be accelerated after double cervical vagotomy, and amplitude can be augmented by stimulation of cutaneous sensory nerves.

In some individuals anoxemia produced a greater change in rate of breathing than in amplitude. In others the reverse occurred. In those dogs in which the rate control was developed at the expense of amplitude control, anoxemia produced the same increase in rate after denervation of the carotid gland, and the same small change in amplitude after double vagotomy with carotid gland innervation intact. In those dogs, in which amplitude control was developed at the expense of rate control, anoxemia produced the same large increase in depth of breathing after double vagotomy, and the same small increase in rate after carotid gland denervation with the vagus nerves intact.

The response to carbon dioxide was relatively little affected by denervation of the carotid gland, by double vagotomy, or section of the pulmonary branches of the vagus nerve. The relative absence of increase in rate and the predominance of increase in amplitude from the administration of carbon dioxide with complete innervation may be due to the depressing effect of carbon dioxide on reflexes. Carbon dioxide saturation, so to speak, produces a partial chemical vagotomy, thereby reducing the rate control of the vagus nerves.

## 7884 C

### Immunologic Studies of Anti-Gonadotropic Sera.

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We have reported<sup>1, 2</sup> that the serum of rats and rabbits treated with anterior-pituitary-like hormone (A.P.L.) of pregnancy urine contained substances capable of protecting test animals against the gonadotropic action of this hormone. The A.P.L. used in these experiments was prepared by alcohol-salt precipitation methods and consequently contained nitrogenous substances giving some of the reactions common to antigenic proteins. It was of interest, therefore, to determine whether the A.P.L.-inhibitory sera of treated animals contained antibodies against A.P.L. in the immunological sense.

<sup>1</sup> Selye, H., Bachman, C., Thomson, D. L., and Collip, J. B., *PROC. SOC. EXP. BIOL. AND MED.*, 1934, **31**, 1113.

<sup>2</sup> Bachman, C., Collip, J. B., and Selye, H., *PROC. SOC. EXP. BIOL. AND MED.*, 1934, **32**, 544.