

dissociation curve there is a large difference in the relative saturations at equilibrium, which will allow the muscle pigment to take up the oxygen from the blood. The respiration of the cells, containing in the case of red muscle a large amount of the oxidase-cytochrome system, can continue at very low pressures of oxygen. The muscle haemoglobin, with its relatively high affinity for oxygen, can be the intermediate carrier of molecular oxygen from the blood to the oxidase-cytochrome system in the cells.

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A. H. T. Theorell, *Biochem. Z.*, 1, 252; 1932.

### Lack of Maturity Hormone in the Hypophysis of the Infantile Rat

RECENT work on endocrines has brought out two facts interesting in their implications. One is that pregnancy urine, blood serum and placental extracts produce lutein cells in the hypophysectomised animal but do not induce follicular growth<sup>1,2,3</sup>; and the other is the discovery<sup>4</sup> of an activation factor in adult beef hypophysis which is not identical with either the growth or maturity hormones. Since it is well known that these pregnancy extracts will induce precocious sexual maturity in normal immature animals (in other words, follicular growth), it seems certain that they contain an activation factor which stimulates the hypophysis of the host, thus initiating growth in the ovary. There is as yet no basis for comparing these two factors, but, since the hypophysis of the pregnant rat shows but little increase in potency over that of the non-pregnant one<sup>5</sup>, this organ would not seem to be responsible for the activator in pregnancy extracts, this probably coming from the placenta.

A similar condition is found when the hypophysis of the infantile rat is implanted into an older host. There is no evidence of the action of the maturity hormone in the ovary before about the eighteenth day<sup>6</sup>, yet when the hypophyses of such rats are implanted into older rats or mice<sup>7</sup>, they induce maturity hormone effects. Like the action of pregnancy extracts, this must be due to some factor which stimulates the hypophysis of the host and not to gonad-stimulating hormones in the implants, and can only be tested in the hypophysectomised animal. A series of such tests, reported elsewhere, do show that implants of hypophyses of male rats 1-13 days old had no reparative effects on the gonads of hypophysectomised male rats, though a satisfactory increase in body weight was obtained in each case, while implants of hypophyses of one day old rats into normal rats 21 days old gave effects equal to those from normal adults.

The hypophysis of the rat up to day 13 thus seems to contain only two hormones, so far as present data go, the growth hormone and a factor which is able to stimulate the hypophysis of an older rat to complete, though precocious, maturity hormone production. Further tests are needed to show which of the other hormones are present during this period. Between this time and day 21, the hypophysis of the rat comes to its fullest capacity of maturity hormone production, since implants of hypophyses of rats 21 days old into litter-mates give greater effects, per

unit weight of implants, than do adult hypophyses. This is also true when implanted into hypophysectomised males, and agrees with the recent work of Lipschütz<sup>8</sup>, who found that the potency of the hypophysis of the female rat of 24-30 days was much greater than that of adult hypophyses. This change in the hormone content of the hypophysis comes at the time when precocious sexual maturity may be induced for the first time. Since the gonads of the rat of this age, and for some days following, show very slight maturity hormone effects, such as follicular growth but little greater than may be found in the hypophysectomised rat, there must be an inhibiting factor which holds the hypophysis in check. There is some evidence<sup>6</sup> that this is, if not the growth hormone itself, at least closely associated with it.

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<sup>1</sup> Noguchi, *Jap. J. Med. Sci. Pharm.*, 5, 104; 1931.

<sup>2</sup> Collip, Selye and Thomson, *NATURE*, 131, 56, Jan. 14, 1933.

<sup>3</sup> Leonard and Smith, *Proc. Soc. Exp. Biol. Med.*, 30, 1248; 1933.

<sup>4</sup> Evans, Simpson and Austin, *J. Exp. Med.*, 57, 897; 1933.

<sup>5</sup> Evans and Simpson, *Amer. J. Physiol.*, 89, 579; 1929.

<sup>6</sup> Swezy, "Ovogenesis and the Hypophysis", Science Press; 1933.

<sup>7</sup> Smith and Engle, *Amer. J. Anat.*, 40, 277; 1927.

<sup>8</sup> Lipschütz, *Endokrin.*, 13, 90; 1933.

### De Moivre's "Miscellanea Analytica"

IN the interesting historical note on De Moivre's "Miscellanea Analytica" in *NATURE* of November 4, p. 713, it is said that many copies have attached to them a *Supplementum* with separate pagination, ending in a table of 14-figure logarithms of factorial.

It may be added that in my copy of this book, after the 22 pages of the supplement, there is an *Addenda Praeli erratis* of two pages, and an interesting "List of the Subscribers" (four pages). Amongst the names of the subscribers are those of J. Bradley, de Maupertuis, J. Stirling, C. MacLaurin and other mathematicians and astronomers, and one Italian, the Marquis Visconti.

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### The Exponential Integral and Cosmical Radiation

MY letter in *NATURE* of October 21<sup>1</sup>, communicating Mr. Booth's correction on this subject, has elicited the information that the exponential integral solution for the absorption of the rays was given in 1926 by Edward Condon<sup>2</sup>, to whom the priority is due. He pointed out that the effect of the atmosphere would work towards making the residual radiation more nearly a parallel beam, for which the simple exponential law applies, but not that the correction for the atmosphere can be applied in the same way for the correct formula as it has been for the incorrect.

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<sup>1</sup> *NATURE*, 132, 638, Oct. 21, 1933.

<sup>2</sup> *Proc. Nat. Acad. Sci.*, 12, 323; 1926.