may occur in any position. *An initial upward deflection* of the QRS occurred only at or outside the apex, never over the sternum. *The QRS duration* measured 0.06-0.08 second. *R-T transition interval.* No elevation or depression over 1 mm. was found in any position. Elevation is common over the sternum but may occur at the apex; the reverse is true of depression. *T-Waves.* A positive or diphasic T-wave occurred in 30% of the cases at the apex and in 60% within the apex. This is in distinct contrast to the findings in adults in whom a positive T-wave is definitely abnormal. Upright T-waves were most frequent over the sternum, decreased progressively toward the apex and disappeared completely outside the apex. With increasing age there was a tendency for the T-wave to be inverted at the apex, *i. e.,* it became the adult type. (See Fig. 1.) The extreme limits for size were —6 and +8 mm.

Conclusion. Positive T-waves at, or within the apex, which are abnormal findings in adults, are normal in children.

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Action of Gonadotropic Hormone from Pregnant Mare's Serum on Ovaries of Rhesus Monkeys.*

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Since the demonstration of Cole and Hart[1] that the blood serum of pregnant mares contains large amounts of gonadotropic hormone, this hormone has been the subject of much investigation. Although the recent work of Catchpole and Lyons[2] indicates a placental origin of the hormone, it has been found to have biological effects similar to those found in the pituitary gland and to differ markedly from the chorionic hormone of human pregnancy. Thus the experiments of Evans, *et al.*,[3] have shown that the hormone of the pregnant mare is able to cause a marked enlargement of the ovaries of hypophysectomized rats, and it has been found to possess a pronounced stim-

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1 Cole, H. H., and Hart, G. H., *Am. J. Physiol.*, 1930, **93**, 57.

2 Catchpole, H. R., and Lyons, W. R., *Am. J. Anat.*, 1934, **55**, 167.

3 Evans, H. M., Meyer, K., and Simpson, M. E., *Mem. Univ. Calif.*, 1933, **11**.

ulating effect on the testes and the comb growth of infantile cocks (Hamburger[4]) just like the anterior pituitary hormone, while the gonadotropic hormone from the urine of human pregnancy is ineffective in this respect.

The difference between the effects of extracts of human pregnancy urine and extracts of anterior pituitary or from castrate urine on the ovary of the monkey has been previously reported (Engle, Smith and Engle[5]).

It has been of interest, therefore, to investigate the effects of an active extract of the serum of pregnant mares on the follicular structure and activity of the ovary of the macacus monkey. Six females, 5 preadolescent and one adult, have been used in this preliminary experiment, the details of which are set forth in Table I.

TABLE I.
Response of Ovaries of Macacus Monkeys to Gonadotropic Hormones.

Animal No.	Wt. gm.	Wt. left ovary, gm.	Treatment — Daily dosage	Treatment — No. days	Sex skin change	Wt. right ovary, gm.
1	3200	.075	100 MU "Antex"	10	± 6th day + 8th "	1.085
2	3040	.068	80-100 MU C. U.	10	± 6th " + 8th "	0.549
3	3200	.129	200 MU "Antex"	10	+ 6th day Max. 9th day	0.995
4	3400	.065	500MU "Antex"	10	+ 5th day Max. 11th day	0.915
5	4450	.099	200 MU "Antex" s. c. 300 MU "Antex" i. v.	5 5 10	+ 4-5th day Max. 11th day	1.985
6	2960	.457 removed on day 6th	200 MU "Antex" s. c. 400 MU P. U. i. v.	5 5 10	+ 5th day Max. 8th day fading 11th day	0.802‡

‡ Not yet studied microscopically; gross examination showed several hemorrhagic follicles.

"Antex"—preparation of serum of pregnant mares, "Løvens kemiske, Fabrik," Copenhagen.

C.U.—extract of urine of menopausal women.

P. U.—extract from urine of pregnant women (prepared by "Løvens kemiske Fabrik").

The results have indicated that, regarding the functional activity and structural changes of the ovary of the monkey, the active principle of pregnant mare's serum closely resembles that found in urine of castrate women. The oestral response of the sex skin of the monkey, seen on day 5 or 6 of treatment, is quite similar to that obtained by oestrin, A.P. or C.U. (Allen, Hisaw *et al.*, Engle), and

4 Hamburger, C., *Endokrinologie*, 1934, **13**, 21.

5 Engle, E. T., PROC. SOC. EXP. BIOL. AND MED., 1933, **30**, 350; Smith, P. E., and Engle, E. T., *J. Pediatrics*, 1934, **5**, 163.

progresses characteristically until the conclusion of treatment after 10 days.[6]

This action of a hormone produced only in an animal with living chorionic tissue, is remarkably different, on this particular test animal, from that gonadotropic substance in the human which is also found only in the presence of chorionic tissue.

Microscopically, the ovaries of the monkey, under the stated conditions, show very healthy conditions of the granulosa, as reported previously for monkeys treated with C.U. (Smith and Engle). There has been after injections of mare's serum, no thecal enlargement, no cystic degeneration nor marked atresia of ova. The only constant morphological change has been growth and proliferation of the granulosa of all medium sized and large follicles, with the immediate and consequent appearance of oestral changes in the sex skin.

Cole, *et al.*,[7] have reported, and we have confirmed, the observation, that the genital apparatus of immature male rats is enlarged after treatment with pregnant mare's serum. In our experience with 4 litters of 22-day-old male rats, each litter injected for 10 days with either mare's serum or P.U., the hypertrophy of the accessory apparatus was similar with both mare's serum and P.U. Histologically, it was impossible to determine any difference in degree of hypertrophy of the interstitial cells, or condition of the tubules of the testes of rats treated with mare's serum or with P.U.

Thus the same preparation which in the immature male rat produced a response resembling P.U., when given to immature macacus monkeys, causes an effect apparently identical with that induced by the urine of human castrates.

[6] Meyer, R. K., and Gustus, E. L., (*Science*, 1935, **81**, 208) have also secured in the rhesus monkey great follicular development and a response of the sexual skin from injections of pregnant-mare serum extract. In their experiments there was regression of the ovarian and sexual skin response with long continued treatments.

[7] Cole, H. H., *et al.*, *Am. J. Physiol.*, 1932, **102**, 207.