

reaction. It is possible, of course, that an at present unknown principle of the anterior lobe rather than the maturity hormone is responsible, but the nature of the material used in this work is indicative of the latter.

A series of controls (8 immature males and females) was injected with the pituitary extract only. In no instance was milk produced nor were the mammary glands hypertrophied during the period of injection (5 to 6 days).

Preliminary work employing oestrin in the growth treatment has been carried out on immature males. Although considerable hypertrophy of the mammary glands was obtained in the 4 animals subjected to this treatment, subsequent injection of the pituitary extract has so far proved unsuccessful in initiating milk secretion. Further work along this line is in progress.

That the factor contained in the lutein extract is not oestrin has been shown by adequate controls. Oestrin may be present, but not in sufficient quantities to respond to physiological tests.

The authors have been able to confirm Corner's work,² using adult virgin guinea pigs which were gonadectomized during oestrus. A copious flow of milk was produced in 3 animals on the second or third day after the treatment was begun. The only agent employed was the anterior pituitary extract referred to above.

The results obtained to date indicate that the mammary glands must first be developed to a proper state by some ovarian factor before the pituitary principle can initiate secretion. On the other hand, ovarian factors alone are not sufficient. These indications are suggestive of the rôle that may be played by the ovarian and pituitary hormones in normal milk production.

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Further Note on a Substance in Liver Active in Pernicious Anemia.

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A method has already been described¹ for the separation from liver of an acidic substance clinically potent in pernicious anemia. The substance on hydrolysis was found to yield β -hydroxyglutamic acid and evidence was also obtained of the presence in the hydrolytic

¹J. Biol. Chem., 1930, **88**, 427.

products of a neutral laevorotatory compound precipitable at least in part by phototungstic acid. This latter substance has been identified as *l*- γ -hydroxyproline. It was characterized by its specific laevorotation, absence of amino nitrogen, phenylisocyanate derivative M. P. 170° and copper salt. The free acid appears identical with the product obtained by the hydrolysis of proteins. The mode of linkage of the hydroxyproline with hydroxyglutamic acid is under investigation.

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Growth of Rickettsia of Typhus Fever (Mexican Type) in the Presence of Living Tissue.

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In spite of several attempts to cultivate the virus of typhus fever by the method of tissue culture, it seems that such cultures could not be carried through repeated successive generations. The methods employed have been practically the same; *viz.*, the cultivation of tissues (generally brain and spleen) from typhus infected guinea pigs in homologous plasma. Thus Kuczynski¹ found the virus of typhus fever virulent for 4-19 days, Krontowski and Hach² for 8 days, Wolbach and Schlesinger³ for 20 days (28 days by transferring the same piece of tissue into fresh medium), and Rix⁴ for 6 days. Recently Zinsser and Batchelder,⁵ using tunica tissue from testicles of guinea pigs infected with Mexican typhus, prepared cultures which were virulent for one week. They were able to demonstrate rickettsias in great numbers in smears from such cultures.

The strain of typhus used in our studies, was isolated from a case in the southeastern United States by the Hygienic Laboratory in Washington, D. C. This strain is in all respects quite similar to the Mexican strain of Mooser. While not all of our attempts to

¹ Kuczynski, Max H., *Berl. klin. Wochenschr.*, 1921, **2**, 1489.

² Krontowski, A. A., and Hach, I. W., *Münch. med. Wochenschr.*, 1923, 144; *Klin. Wochenschr.*, 1924, **2**, 1625; *Arch. f. exp. Zellforsch.*, 1926-27, **3**, 297; *Z. f. Immunitätsforsch.*, 1927-28, **54**, 237.

³ Wolbach, Burt and Schlesinger, Monroe, J., *J. Med. Res.*, 1923-24, **39**, 231.

⁴ Rix, Erich, *Z. f. Hyg. and Infek.*, 1928, **108**, 103.

⁵ Zinsser, Hans, and Batchelder, Albert P., *J. Exp. Med.*, 1930, **51**, 847.