organella which undergoes fission would form an equivalent to the euchromatin of the metazoan cell; the ribose system would be looked upon as a functional counterpart to the heterochromatin. From the former the formation of gene protein is induced; the latter controls the formation of the protein of the cell body. This latter process is reflected in great changes in the content of ribose nucleotides in the individual bacterium.

A detailed account of this work will be published shortly.

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Cytochemical Effects of Œstradiol

The œstrogenic action of certain carcinogenic hydrocarbons such as 3:4 benzpyrene and 5:6 cyclopentane-1:2 benzanthracene and the carcinogenic effect of œstrogenic hormones (see recent review by Greenstein[1]) suggested to us a comparison of the cytochemical effects of œstradiol on the vaginal wall of mice with the primary effects of methylcholanthrene on the epidermis studied in detail by Cowdry and his collaborators.

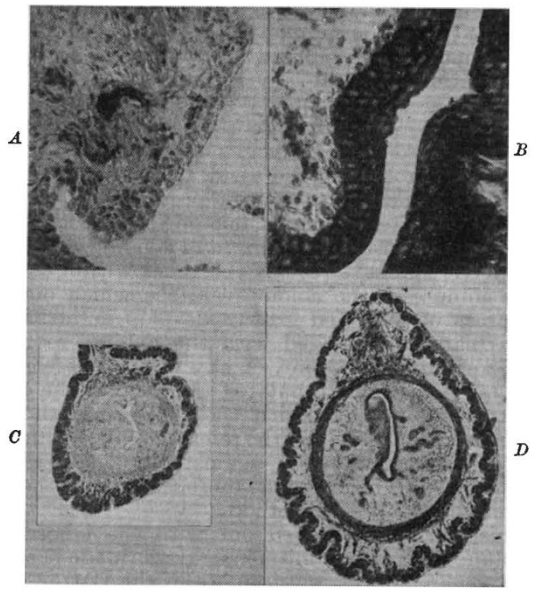
As early as 24 hours after the injection of 10 mgm. œstradiol into a mouse, ovariectomized one month previously, the proliferating vaginal wall shows a very marked increase in alkaline phosphatase activity, especially in the cytoplasm of the cells (technique of Gomöri[2]). This observation was confirmed by *in vitro* determinations of phosphatase activity in vaginal extracts, which show that orthophosphate liberated in three hours from sodium glycerophosphate increases, for example, from 430 γ to 1,500 γ P per mgm. protein nitrogen. This increase in alkaline phosphatase activity is accompanied by a large increase in cytoplasmic ribonucleic acid detected by the ribonuclease technique of Brachet and confirmed by estimations following Schneider's technique[3].

These two phenomena are comparable to those which have been found to occur in mouse epidermis after methylcholanthrene treatment (Biesele[4]).

An increase in alkaline phosphatase activity of the same order of magnitude is shown in the uterus, principally in the circular muscle layer[5]. In this organ, also, there is a parallel increase in the concentration of ribonucleic acid. One can observe regularly a slight increase in alkaline phosphatase activity in the liver, but no increase in brain, kidney or blood plasma.

Brachet and Jeener[6] have put forward the hypothesis that the increase in phosphatase activity observed in the nuclei of regenerating liver may be related to the increase in thymonucleic acid phosphorus turnover. A similar hypothesis does not seem to be applicable to variation in cytoplasmic phosphatase activity. For example, the ribonucleic acid metabolism in pancreas must be very high (Caspersson[7]), notwithstanding the fact that phosphatase content of this organ is very low.

On the other hand, the data given in this report are in agreement with the idea that an increase in alkaline phosphatase is not parallel to general protein synthesis, but only to the synthesis of fibrous proteins (see review by Moog[8]). Keratin is rapidly synthesized by the vaginal wall under the influence of œstradiol. Some preliminary data lead us to believe that myosin synthesis occurs in the uterus under the same conditions. The absence of any increase of phosphatase activity in the crop of the prolactin-injected pigeon can well be explained by the absence of any histological signs of keratin or collagen fibre synthesis during the growth of its mucosa. Finally, we note the similarity between effects of œstradiol on vaginal and uterine phosphatase and those of androgen hormones on the prostate (Gutman[9]).



A and *C*, vaginal epithelium and uterus of a castrated mouse; *B* and *D*, same tissues 24 hours after injection of 10 γ œstradiol. Sections treated simultaneously by Gomöri's technique

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Synthesis of Methionine and Similar Amino-Acids

Of several recent syntheses of *dl*-methionine, that commencing with γ-butyrolactone[1] is relatively long, while others[2] are additionally inconvenient in that they employ methyl-β-chloroethylsulphide, a vesicant intermediate. It seems, therefore, desirable to state that the following series of reactions has been found to afford an overall yield of *dl*-methionine of 29 per cent (that is, based on acrolein), and to be free from disadvantages such as those mentioned above:

$$CH_2:CH.CHO \xrightarrow{MeSH} CH_2(SMe).CH_2.CHO \xrightarrow{HCN}$$
$$CH_2(SMe).CH_2.CH(OH)CN \xrightarrow{NH_3/EtOH}$$
$$CH_2(SMe).CH_2.CH(NH_2)CN \xrightarrow[\text{at } 100°]{\text{Conc. HCl}} dl\text{-methionine.}$$

Commercial acrolein containing a trace of triethylamine was treated with methylthiol to give