relatively recent infarct in the posterior wall of the left ventricle the precordial potentials simulated those of anterior wall infarct; (3) in bundle branch block the QRS may be similar to, though wider than, that found with infarction of the anterior wall of the heart. This may easily lead to erroneous diagnosis as in one case of this series that was further complicated by marked displacement of the heart by a large aortic aneurysm. (4) Small scars in the posterior wall cannot be detected. (5) The presence of an infarct in the anterior wall may be very evident from a study of the precordial potentials when standard leads are not characteristic.

8286 P

Stimulation of Abnormal Mammary Growth by Large Amounts of Estrogenic Hormone.

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(Introduced by Edgar Allen.)

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Purified estrogenic hormones (theelin and theelol)* induced a growth of the mammary duct system (Turner, *et al.*[1]) Theelin stimulated a growth of the mammary duct system of male mice (Turner and Gomez[2]; Gardner, Diddle, Allen, and Strong[3]). The extent and type of development were comparable with that observed in mature virgin female mice or male mice bearing ovarian grafts (Gardner[4]).

The water soluble hormone (theelin) in daily doses of 1 to 5 rat units administered subcutaneously in 2 injections induced a localized excessive development of lobules of alveoli along the mammary ducts of male mice of one strain (C_3H). A high percentage of females of this strain developed mammary cancer. Similar lobules of alveoli have been found in the mammary glands of male mice from one other cancer susceptible and one cancer resistant strain when theelin had been administered for periods of several months.

* "Theelin" and "Theelol" refer to the Parke, Davis Company products.

1 Turner, C. W., *et al.*, *Anat. Rec.*, 1932, **53**, 227.

2 Turner, C. W., and Gomez, E. T., Mo. Agr. Exp. Sta. Res. Bul. 206, 1934.

3 Gardner, W. U., Diddle, A. W., Allen, E., and Strong, L. C., *Anat. Rec.*, 1934, **60**, 451.

4 Gardner, W. U., *Endocrinology*, 1935. In press.

The present observations were made on male mice from 2 cancer susceptible strains (A and C_3H), which were given weekly injections of 500 international units of folliculin benzoate† in oil. The mice were from 3 to 28 days old when placed on experiment. They were removed at periods varying from 101 to 172 days. The total amounts of folliculin benzoate varied from 7,500 to 12,500 units. The 6 mice that were 28 days old developed scrotal hernias after 6 to 8 weeks of treatment. Hydronephrosis and other conditions developed at a later date resulting in a rapid emaciation.

As the mice were not removed during the early stages, the rate of mammary development was not determined. The extent and type of mammary growth will be compared with that observed in male mice receiving small daily doses of water soluble theelin.

All of the mammary rudiments did not respond. Some of them persisted as very small rudimentary ducts. The extent or area of the mammary glands was uniformly less than that in the mice receiving theelin. The major ducts were of approximately one-half the length of the controls. Unlike the theelin-treated controls, also, extensive areas of most of the glands had developed lobules of alveolar tissue. The greater part of the gland thus resembled the glands of mice during late pregnancy at which time the alveoli are well developed. Unlike the development of the glands during pregnancy, an overgrowth of the mammary connective tissue had occurred in some areas. The ducts of the glands were distended with secretion and upon examination *in toto* at low magnification presented a beaded appearance.

Microscopic examination of the extensive areas of alveolar development usually revealed well formed mammary lobules. The alveolar epithelium was frequently vacuolated and secretion was present in the lumen. Some of the alveoli were completly filled with vacuolated epithelial cells. In other lobules the epithelium was inactive and the alveoli contained but little secretion. Some lobules were in a rapid stage of development as mitotic figures were frequent. Some of the hyperplastic lobules resembled small adenomatous growths. It is believed that the cancers appearing in the glands of such mice arise in these rapidly growing areas. The distended, beaded ducts contained a more or less homogeneous secretion containing scattered epithelial cells and leucocytes. Where large amounts of secretion had accumulated the duct epithelium was very thin or

† The folliculin benzoate [Benzo-gynoestryl, $C_6H_5CO(C_{18}H_{21}O_2)$] was obtained from Dr. Girard (Paris). It has been prepared from the urine of pregnant women and dissolved in oil (10,000 international units per cc.).

absent. At intervals epithelial cells and leucocytes enveloped a section of the secretion giving the ducts the beaded appearance.

Summary. Large amounts of estrogenic hormone in the form of folliculin benzoate, when injected subcutaneously at weekly intervals, induced a stunted development of the mammary duct system as compared with that developed in mice receiving small amounts of theelin daily. Extensive areas of alveolar development and some areas of excessive development of the connective tissue stroma were induced. The extent and type of mammary growth induced in the male mice receiving folliculin benzoate thus differed from that observed in virgin female mice or induced experimentally in male mice receiving theelin.

8287 C

Paget's Disease: Relative Constancy of Serum Phosphatase Levels over Periods up to Two Years.

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Kay[1] and, independently, Roberts[2] were the first to point out that the phosphatase activity of the blood is increased in osteitis deformans. This observation has been confirmed and extended by subsequent investigators[3-8] whose conclusions, based upon determinations on a combined total of approximately 200 cases may be summarized as follows:

1. Increased serum (plasma) phosphatase activity is a consistent manifestation of polyostotic Paget's disease.[3-8] In localized Paget's disease, the serum phosphatase activity is usually increased[4-8] but the increase may not be marked,[4, 5, 7, 8] and in occasional cases, the values may be within normal limits.[4, 5, 8]

1 Kay, H. D., *Brit. J. Exp. Path.*, 1929, **10**, 253.
2 Roberts, W. M., *Brit. J. Exp. Path.*, 1930, **11**, 90.
3 Kay, H. D., *J. Biol. Chem.*, 1930, **89**, 249.
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6 Kay, H. D., Simpson, S. L., and Riddoch, G., *Arch. Int. Med.*, 1934, **53**, 208.
7 Bodansky, A., and Jaffe, H. L., *Arch. Int. Med.*, 1934, **54**, 88.
8 Gutman, A. B., Tyson, T. L., and Gutman, E. B., *Arch. Int. Med.* In press.