preciably. Thus, of some 9 patients studied, only 3 showed total excretion of 2% or less during the first 5 days, while the remaining 6 patients demonstrated a cumulative excretion of 5 to 35% of administered dose during this same time interval. Quite probably this latter figure (35% in 4 days) was associated with gross hematuria in this particular patient. There seems no obvious correlation between tissue deposition in the individual patients and the excretory patterns shown by them.

Summary. 1. Simple technics have been described for preparation of 2 new colloids of radioyttrium $Y(OH)_3$ and YPO_4. Maltose has been employed as suspending agent for the former, carboxymethylcellulose for the latter. Both products have been demonstrated to have a small, uniform particle size, good emulsion stability, and low percentage dialyzable radioactivity. 2. The LD_{50} of $Y(OH)_3$ – Y-90 in mice was approximately 12 to 14 mc kg. 3. Tissue deposition in mice and terminal human patients has been predominantly reticulo-endothelial in both. Evidence is suggestive that some metabolic dissociation occurs with subsequent deposition of yttrium in bone. 4. Urinary excretion of activity has been evaluated for mice and man.

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Normal Growth of Rat Mammary Glands During Pregnancy and Early Lactation.* (26365)

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Kirkham and Turner(1) first suggested desoxyribonucleic acid (DNA) may be employed as a quantitative index of mammary gland development under normal and experimental conditions. By this method, mammary gland proliferation has been observed to occur through pregnancy in the mouse(2, 3), and during lactation in the rat and mouse (3,4). This paper presents a more detailed study of mammary gland growth during pregnancy and early lactation in the rat.

Methods. Data were obtained from primiparous Sprague-Dawley-Rolfsmeyer rats on days 5, 10, 15, 18-20 of pregnancy and on days 1, 2, 3, and 4 of lactation. Days of pregnancy were determined by presence of sperm within the vagina. Six abdominal-inguinal mammary glands were removed from each rat and placed in a deep freeze for 4 days, extracted in 95% ethanol for 3-5 hours and in ether for an additional 3-5 hours. Dry, fat-free tissue (DFFT) was weighed and ground to a fine powder in a Wiley mill. DNA of a 25 mg aliquot of tissue was determined by method of Webb and Levy(5). Product of quantity DNA/mg DFFT and DFFT/100 g body weight (B.W.) was estimated as "total DNA".

Results. Mammary gland DNA/100 g B.W. of normal non-pregnant rats has been

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TABLE I. Normal Growth of Rat Mammary Gland during Pregnancy and Early Lactation.

Stage of pregnancy or lactation	No. of animals	Body wt (g) mean	DFFT* (mg) mean	DNA (μg/mg DFFT)	Total DNA (mg/100 g B.W.)
Virgin control†	10	281	303	28.8 ± 1.0 §	3.11 ± .14
5th day of pregnancy	21	252.5‡	288	25.2 ± .88	2.83 ± .09
10th *idem*	21	255.0‡	363	33.0 ± 1.81	4.52 ± .35[2]
15th "	19	264.4‡	422	43.0 ± 1.89	6.76 ± .31[2]
18-20 " †	19	324.3‡	749	33.2 ± .80	7.63 ± .39[2]
1st day of lactation	11	245.3	584	35.6 ± .95	8.46 ± .77
2nd *idem*	10	247.5	659	37.7 ± 1.55	10.05 ± .52[3]
3rd "	8	268.6	789	37.1 ± 1.72	10.78 ± .34[4]
4th "	8	262.8	735	37.5 ± 1.26	10.45 ± .64[4]
5th " †	10	301.5	954	34.1 ± .73	10.80 ± .57[4]
14th " †	25	298.1	1240	26.3 ± .5	10.92 ± .43[4]

* Dry, fat-free tissue. † Data from Moon *et al.*(7) and Griffith & Turner(4). ‡ Corrected for wt of fetuses. § Mean and stand. error of mean.

[2] Signif. to day 5 of pregnancy at .1% level.
[3] Signif. to day 18-20 of pregnancy at .5% level.
[4] Signif. to day 18-20 of pregnancy at .1% level.

reported as 3.11 mg(6) and corresponding ovariectomized values as 3.05 mg(7). DNA was found to increase progressively from 2.83 mg at day 5 of pregnancy to 4.52 mg 6.76 mg, and 7.63 mg at days 10, 15, and 18-20 of pregnancy (Table I). DNA was significant ($P>.001$) between days 5 and 10; values at days 15 and 20 of pregnancy were significantly increased ($P>.001$) in comparison to the 5th day. Significance was also observed between days 10 and 15, but the increase from days 15 to 20 was not significant ($P<.05$).

DNA increased after parturition until day 2 of lactation and statistically remained at this level throughout lactation. DNA of day 2 of lactation was not significant ($P<.05$) but days 3, 4, and 5 are highly significant ($P>.001$) to the latter days of pregnancy. There is no significant difference between the values throughout lactation except in comparison to day 1.

The decrease of DFFT during early lactation can not be explained at present time.

Discussion. Data presented here indicate lobule-alveolar development of mammary gland in rat continues throughout pregnancy and early lactation. Considering extent of mammary growth at end of pregnancy, only 81.9% of maximum development occurred by the 15th day of pregnancy; the remaining 18.1% occurred during the last 5 days of gestation. Similar results were observed with pregnant mice(2,3).

Data presented previously(4) indicated the mammary glands do not attain maximum cellular development until days 5 or 10 of lactation. Extending study to include days 1, 2, 3, and 4 of lactation, DNA was found to increase significantly by day 3 of lactation.

When extent of mammary growth at day 14 of lactation was considered as 100%, the mammary gland only attained 59.3% of its maximum development by end of pregnancy. The remaining 40.7% occurred during early lactation. The present findings which are in conflict with older views of mammary development are substantiated by recent investigations(3,8). Estimation of total DNA of mouse mammary glands revealed 76.3% of total development was obtained during pregnancy; 23.7% occurred after parturition(3). Greenbaum and Slater(8) determined the nucleoprotein content of homogenates of rat mammary tissue. Between days 1 and 3 of lactation DNA-P level was doubled in 2 ml of a 1:10 tissue suspension. Authors suggested a wave of mitosis occurs in gland at parturition. By the use of colchine, a wave of cell division was observed approximately 30 hr after parturition, and number of nuclei/mg wet tissue of mouse mammary gland was found to increase approximately 120,000 from day 1 to 2 of lactation.

Summary. Previous morphological studies were interpreted as indicating complete lobule-alveolar development by first ½-⅔ of

pregnancy. By estimation of DNA, a study of rat mammary gland growth was conducted through pregnancy and early lactation. Present data show 20.9% of total growth occurs during the first 10 days of pregnancy, 59.3% by the 20th day of pregnancy, and development is 98.3% complete by the 3rd day of lactation.

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Absorption of Potassium Iodide from Gastro-Intestinal Tract.* (26366)

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Prompt excretion of orally administered iodide by the salivary gland provides a simple measure of the rapidity of its absorption from the gastro-intestinal tract. Salivary iodide excretion is clearly altered in a variety of clinical states in man(1), but the site of its absorption is controversial(1,2,3,4,5,6). In view of its possible utility as a measure of gastrointestinal absorption, it seemed desirable to determine what organ or organ system is involved in its absorption.

Methods. 1. *Human*: The potassium iodide absorption test(1) was conducted as follows: Subjects were given a solution of 0.25 g of potassium iodide in water, *per os*, following a 14- to 16-hour fast. Their mouths were then rinsed. Saliva was collected every 2 minutes and tested for presence of iodine (1 ml of saliva added to 1 ml of a 1% starch solution containing 4 drops of a 10% $FeCl_3$ solution; this test is positive for as little as .0027 mg of iodine). Ten normal subjects were found to have iodine present in their saliva in from 6 to 14 minutes, well within the normal limits determined by Heath(1). Seven of these subjects were retested similarly, except that $BaSO_4$ was added to the potassium iodide solution in sufficient quantity to produce a moderately thick suspension, and the studies were done under fluoroscopic control. The subjects were placed on a fluoroscopy table and were rotated so that all portions of the stomach were exposed to the iodide-containing radio-opaque medium. They then were placed in a supine position, rotated slightly to the left. Saliva was collected and tested for iodine every 2 minutes, and fluoroscopic observations were made at these same intervals. One of the subjects in this group was restudied (after an interval of 3 days) with Urokon® (50%) as the opaque substance to obviate the possibility of physical interference with absorption by $BaSO_4$. The saliva of all of the above subjects contained no iodide until some of the radio-opaque medium had been seen to pass into the duodenum (Table I).

A solution of potassium iodide was instilled, *via* a tube, directly into the duodenum of 2 of the previously tested subjects. Iodide was detected in their saliva in 2 to 4 min-

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