chondrial alterations, for example, are not detectable when cells are irradiated in 0.15 *M* glucose, 0.15 *M* monopotassium phosphate, or 0.15 *M* potassium chloride solutions. The precise roles of such extrinsic factors in the expression of radiation damage remain to be determined.

It is not possible at present to ascribe a fundamental relation to the disorganization of mitochondria and ultraviolet-effected cellular inactivation, since the changes reported here are brought about only under specific conditions and at relatively high doses. However, these striking phenomena, together with the demonstrated increase in radiation resistance with decrease in cytochrome activity (*11*), implicate the cytochrome-oxidase-rich mitochondria as critical ultraviolet-absorbing sites and suggest that mitochondrial damage may serve a characteristic function in cytoplasmically mediated recovery processes.

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Visible Intra-Epithelial Iron in the Mammary Glands of Various Species[1]

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The occurrence of stainable iron in the mammary epithelium of mice has been noted (*1–3*). Schultz also found it in the mammary glands of rats, both male and female, and in one case in a female guinea pig. Further investigation has shown the phenomenon to be so widespread that its significance should be assessed by workers in various fields.

The technique for demonstrating the iron is simple (*4*). The tissue is fixed in 10% formalin, preferably buffered (*5*), and stained by the method of Gömöri (*6*), using equal parts of 20% hydrochloric acid and 10% potassium ferrocyanide for about ½ hr. It is necessary to wash out the stain as completely as possible with distilled water. Clearing is done through 95% and absolute alcohol to xylol. If the pieces of tissue are large and are to be used as whole mounts, a bath of oil of origanum after the absolute alcohol aids in clearing. The extent of the iron deposition in whole mounts is best seen under a dissecting microscope with low or moderate magnification. Usually the iron is present to such a degree that the gland tree is clearly outlined (Fig. 1). The procedure can be carried out while the glands are still on the hides with small animals such as the mouse, or even the rat, and the gland viewed by reflected light, but staining is more satisfactory if, after fixation, the gland tissue is scraped off the hide. Care should be taken to avoid iron contamination as much as possible. With bigger pieces of tissue from the more extensive glands of larger animals, the material should be fixed and stained in blocks about 0.5 cm thick. Such pieces often show a marked staining reaction visible to the naked eye within a few seconds of immersion in the staining fluid.

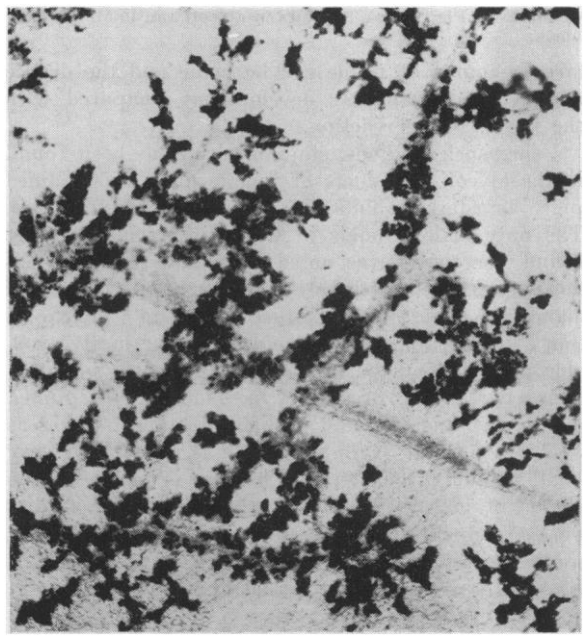

FIG. 1. Area from a whole mount of a mammary gland of a rat about 9 months of age that had had a litter some time previously; stained by hydrochloric acid and potassium ferrocyanide. Stained iron appears black and outlines gland tree. × 35.

A useful procedure for large pieces of tissue is to run them up in thin but extensive slabs into celloidin and make sections 100–200 μ thick. These can be gathered alternately into two groups, one of which can be stained with hematoxylin alone and the other by the Gömöri technique. By examining these in xylol under low magnification a quick but thorough survey of

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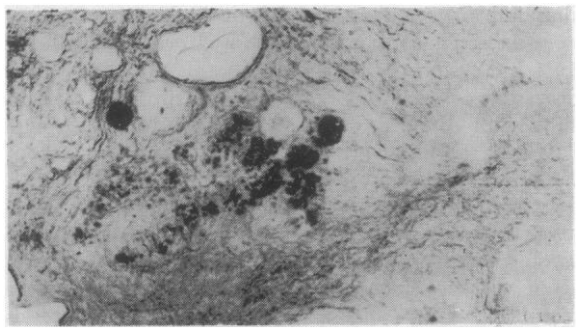

FIG. 2. Area from a biopsy from the breast of a 35-year-old woman; celloidin section 100 μ thick; staining and magnification as in Fig. 1. Iron deposits in alveoli and lumina appear black.

large amounts of tissue can be made and the degree and type of glandular development compared with the iron-staining reaction.

Using such methods, stainable iron has been found in the alveoli and ducts of female mice, rats, guinea pigs, hamsters, rabbits, dogs, cats, pigs, and sheep. The only male animals in which iron was normally found was the rat, as noted by Schultz, and the extensive development here is very curious. The resting mammary gland of the mature female in full involution after pregnancy and lactation is the most favorable place to find the iron, but it is also abundant in the early stages of pregnancy in the mouse, rat, guinea pig, rabbit, and pig, and probably in other species as well. In mature virgin mice iron is present in very small amounts, but it is much more extensive in the glands of mature virgin rats. As far as our studies went, it appears to be absent in the virgins of other species. Although it is present in early pregnancy, it disappears completely in the latter part and in lactation.

Stainable iron was not marked in the specimens of bovine glands collected, but in thick celloidin sections from the mammary gland of an old cow a faint blue color in the alveoli demonstrated the presence of visible iron. In the case of the human female, Lendrum (*7*) and Bunting (*8*) have pointed out the occasional presence of epithelial iron in the type of mammary tissue that resembles apocrine sweat glands. We made thick sections from a number of biopsy specimens, a few of which showed faint but definite blue staining in some of the alveoli and ducts. One, from material taken from a 35-year-old woman and diagnosed as adenosis of the mammary gland by the Department of Pathology, showed scattered areas with marked deposition of iron in the alveoli and ducts (Fig. 2).

The fact that iron is deposited in the mammary epithelium in such a wide variety of species, along with the similar finding in human apocrine sweat glands (*9*), lends support to the contention of Schiefferdecker (*10*) that the mammary gland develops both phylogenetically and embryologically from apocrine sweat gland tissue. Moreover, the facts reported here show that the mammary gland must be considered in any concept of iron metabolism, storage, and even excretion, not only in laboratory animals, but also in the human, as Martines (*11*) has pointed out in his studies of elimination of iron through milk. The limitations of this laboratory have made impossible complete investigation of the conditions of iron deposition in the above species except the mouse and rat. It remains for others to fill in the picture according to their own particular objectives.

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Observations on the Nutritive Value of Teosinte

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Little is known of the nutritive value of teosinte (*Euchleana mexicana*), although it is the closest known relative of corn (*Zea mays*). The kernels of teosinte differ from those of corn in their smaller size and hard, inedible hull. Teosinte has long been grown in association with corn by the indigenous peoples of Central America and Mexico. It is sometimes cultivated as a cattle feed and is also used in human diets in a few localities, particularly as a corn substitute in times of famine.

Four strains of teosinte have been analyzed for several important nutrients. Fat was determined by official and tentative methods of the AOAC (*1*). In the determination of nitrogen, digestion was carried out by the AOAC method (*1*), and distillation and titration as recommended by Hamilton and Simpson (*2*). Microbiological methods employing *Lactobacillus arabinosis* were used for the determination of methionine (*3*), niacin (*4*), and tryptophane (*5*), following the hydrolysis procedure of Wooley and Sebrell (*6*). *Leuconostoc mesenenteroides* was used in the analysis for lysine (*7*). The results, compared with a Guatemalan corn and a high-yielding U. S. commercial hybrid, are reported in Table 1.

The nitrogen values for teosinte are considerably higher than those for corn. They are also superior to those for other cereals, as, for example, wheat (2.03), rice (1.07), barley (1.44), and oats (2.08) (*8*). Of even greater significance is the correspondingly higher