

cells and may become precipitated around the submucosal vessels. Beta-naphthylamine contained in the blood, on the other hand, may be released from the mucosal capillaries into the epithelial lining and may be excreted by them into the urine. Schär contends, that a cancerization of the epithelium occurs only, if minimal quantities of the suspected aromatic amines act upon the mucosa, while an exposure to large amounts of these chemicals does not exert a carcinogenic action. While the excretory function of the vesical epithelium alleged by Schär must remain problematical, the experiments of Mann and Magoun with phenolsulphophthalein and the extensive investigations of Hishikawa with numerous basic and acid aniline dyes have established definitely the fact that the normal bladder mucosa in mammals is capable of resorbing appreciable quantities of these substances. This permeability, however, is markedly increased and is extended to dyes which normally do not penetrate the bladder lining if inflammatory changes in the vesical mucosa exist. The author, several years ago, conducted some preliminary investigative work on lines similar to those followed by Schär which elucidates some of the observations made by this investigator.

The purpose of the experiments was an attempt to demonstrate beta-naphthylamine in the tissues with the help of color reactions. Nitro-aniline, diazotized by the addition of a small amount of sodium nitrite, was used as a reagent, since a watery solution of this compound (10 per cent nitro-aniline plus a few drops of 5 per cent solution of sodium nitrite) gives, when coming in contact with even very small amounts of beta-naphthylamine, an intensely cerise red precipitate.

Mice, which had been given subcutaneous injections of 0.01 gm. of beta-naphthylamine, were opened after from one to two hours while still living. A freshly prepared mixture of the reagent described was dropped on the bladder, liver, kidney and finally the lungs. The organs were studied with a Zeiss epicondenser under direct reflected light. Accumulations of reddish granules were seen in the superficial cells of the liver (hepatic cells and Kupfer cells) and of the kidney (tubular epithelium and lumens). When this reagent was injected directly into the bladder filled with brown urine, a heavy red precipitate was formed. Following intracardial injections of the reagent, orange-red granular deposits were observed in the wall of the bladder, especially in the lumens and perivascular tissue of blood vessels. The epithelium of the bladder appeared to be without colored matter, except some cells with fine, dustlike, red-brown granules located in their cytoplasm. These observations were substantiated on unstained frozen sections prepared from unfixed tissue with the cooled knife method (Hueper, 1934).

A second series of mice, which were given subcutaneous injections of 0.002 gm. of beta-naphthylamine hydrochloride three times at four-day intervals, were killed in pairs—three, five and ten days after the last injection. None of the organs tested showed any color reaction, grossly or microscopically. The