

and to thus exclude the bladder mucosa from any contact with urine, leaving only the possibility of hematogenous action. A positive outcome of such an experiment, i.e., the formation of bladder tumors, would greatly support the hematogenous theory. But a negative result would not disprove it entirely, as one might argue that the marked impairment of the circulation of the blood in the functionally inactive bladder might have influenced its reactivity. Hueper suggested therefore that one or both ureters of the female dog be explanted to the uterine horns or to a rectal pouch serving as an artificial bladder and that a sigmoidostomy be done to take care of the fecal eliminations. The appearance of tumors in the uterus or in the rectal "bladder" would indicate that the urine contained carcinogenic agents.

The factual evidence available at present lends little support to the hematogenous conception. Many of the serious objections which may be raised against its validity are contained in the discussion of the data favoring the urogenic origin of aniline tumors. They do not need to be repeated. There are, however, a few points which may be worth considering in this connection.

The hematogenous theory actually assumes the presence of a two-fold affinity: a primary, purely chemical, one of the terminal capillaries in the submucosa only, exempting the elements of the second vascular network located in the muscularis; and a secondary carcinogenic epithelial affinity, leaving the primarily involved mesenchymal elements unaffected, as so far practically none of the aniline tumors has been of a sarcomatous type. Such a selective behavior of a chemical carcinogen, which cannot be accounted for by any known special chemical secretory or excretory qualities of the bladder mucosa, must appear extraordinary in view of the well established faculty of the various synthetic carcinogenic chemicals to elicit carcinomatous as well as sarcomatous responses, depending mainly on the type of tissue with which immediate contact occurs. A comparison with arsenical carcinoma scarcely is justified, for not only does the skin possess a known chemical affinity for arsenic and, therefore, stores it and excretes it with the sulfur-containing compounds contained in keratin and hair, but arsenic causes a fundamental disturbance in the distribution and production of melanin. In a discussion of the interrelations apparently existing between the agent and the soil in carcinogenesis, Woglom also supported the conception of an organ specificity of the bladder to aromatic amines. He contended that aniline produces tumors only in the bladder, but not in other parts of the urogenous tract, that is, the kidney and the ureter. Inasmuch as this argument is contrary to the facts recorded above, his assertion can be discounted justly.

Reference must be made to some observations made by Schär, who concluded, from his experiments on the resorptive and excretory properties of the vesical mucosa, that this membrane possesses a secretory as well as resorptive function. Naphthylamine present in the urine and coming in contact with the epithelial cells of the vesical mucosa may be resorbed therefore into these