the bladder is thus more than ten years, being only exceptionally very much shorter, while the preparatory period of the experimental variety obtained in dogs is about two years for the majority of animals. This difference is caused in part by the much more intense exposure to beta-naphthylamine to which the dogs were subjected (receiving from one-tenth to one-fourth of the single lethal dose of this substance daily), than that found in well conducted dye operations. An important additional reason for the species specific differences in susceptibility to the various carcinogenic agents is represented by the fact that the mechanical defense mechanism, operative in the detoxication of the chemical carcinogens, differs with the chemical nature of these substances and to a certain extent with the species. Young, who reviewed the information available on the detoxication of carbocyclic compounds, mentioned in this connection that rats, for instance, detoxify benzoic acid with glycine, and bromobenzene with cystine and methionine, which is converted into a mercapturate. Boyland and Levi showed that rabbits and rats both excrete anthracene administered orally as 1.2-dihydroxy-1.2-dihydroanthracene, but rabbits form the d-compound while rats form the l-substance.

Although aromatic amino compounds usually undergo in the animal organism acetylation, there exist species specific differences in this respect. Dogs excrete o-, m-, and p- aminobenzoic acid unchanged; man eliminates only the o-compound unchanged. Similar differences occur in the metabolic detoxication of such substances by the dog and rabbit, the latter species using the acetylation process more generally than the dog. While the dog excretes beta-naphthylamine as 2-amino-1-naphthol, this product could not be isolated from the urine of rabbits with the methods used for the dog's urine (Wiley), suggesting that an important difference in the conjugation products formed by these two species exists. Herbivores (rabbits) oxidize acetanilid in the para-position forming p-amino-phenol, conjugated with sulfuric acid and glucuronic acid through splitting off of the acetyl group. This metabolite can be isolated from the alkaline ether fraction of the urine, while no metabolite is obtained from the acid urinary fraction. Carnivores do not form any p-aminophenol in the basic extract, but convert the acetanilid into o-oxycarbanil, which is paired with the sulfuric acids and glucuronic acid, and appears in the acid urinary fraction. The oxidation of the acetanilid takes place under these circumstances in the ortho-position without the elimination of the acetyl group. The first conversion product is the unstable o-oxyphenyl carbaminic acid, which changes spontaneously into o-oxycarbanil. Variations in regard to the site of detoxication of certain compounds are found between the different species. Although the liver is considered usually as the main organ in which carbocyclic compounds are detoxified, the kidney represents a second and sometimes important site of detoxication.

Thus, a great variety of chemical defense mechanism may come into action and result in the formation of a large number of metabolites, differing in com-