Alexandrescu). The occurrence of gastric papillomatosis in rabbits, following the intragastric introduction of tar, was recorded by Ishibashi and Ohtani. A similar effect was seen occasionally by Twort and Ing in mice treated with carcinogenic shale oils.

*Synthetic Carcinogenic Hydrocarbons.* The production of a spindle cellular type of carcinoma in the stomach of rats fed with benzpyrene, dissolved in lard, was reported by Waterman. He observed the development of a carcinoma of the forestomach in a rat which had received orally cholesterol oleate, obtained from a mixture of cholesterol and oleic acid prepared in a vacuum by heating the mixture to 200°C for two hours. Benzpyrene fed as a colloidal solution was ineffective. A negative result was obtained by Ilfeld, who implanted pellets of 1.2.5.6-dibenzanthracene into the gastric wall of rats and mice. Branch commented on the absence of gastro-intestinal tumors in mice painted with dibenzanthracene in spite of the fact that the content of this tract showed a fluorescence indicating the presence of the chemical.

Otsuka succeeded in the production of a gastric papillomatosis in rats kept on a diet containing diazoaminobenzol. The tumors occupied the fundus, were not malignant, and appeared in eleven rats surviving for more than 11 months while being on this vitamin deficient diet. These observations were confirmed by Sasaki and Yoshida, who likened the gastric papillomatosis of the rats to that observed by Fibiger following the infestation with Spiroptera neoplastica. Van Prohaska, Brunschwig, and Wilson obtained 2 papillomas in the stomach of 48 mice fed with methylcholanthrene. Waterman reported squamous-cell carcinomas in the gastric mucosa of 5 out of 6 mice receiving oral administrations of benzpyrene. Kinosita reported that the oral introduction of 4-oxyazobenzene and of 4:4′ tetramethyldiaminobenzophenone into rats resulted in the formation of gastric papillomas, while the action of 4:4′ tetramethyldiaminodiphenylmethane was less pronounced.

Numerous attempts made by other investigators to produce cancers of the stomach by the oral introduction of carcinogenic chemical agents ended in failure (Reinhard and Candee; Oberling, Sannié, Guériné, and Guérin; Stewart; Cook, Haslewood, Hewett, Hieger, Kennaway, and Mayneord.

Recently, Stewart and Lorenz caused squamous-cell cancers of the stomach in mice, by the oral administration of such carcinogens. The production of malignant, gastric neoplasms by the direct injection of the carcinogenic agent into the wall of the stomach gave positive results in several instances, showing the neoplastic reactivity of the gastric tissues to these agents (Stewart; Rusch, Baumann, and Maison). The production of cancer and precancerous, hyperkeratotic lesions in the forestomach and pyloric region of rats fed with appropriate amounts of pure sulfur and cholesterol was claimed by Tanaka. Klein and Palmer concluded from an analysis of the literature that there does not exist a single, well-established case of an adenocarcinoma of the stomach produced experimentally.

*Aluminum.* The alleged connection between an exposure to aluminum and