in a state favoring a cancerous transformation in analogy with the theory propounded by Warburg as to the causal significance of the fermentative processes in the cancerization of cells. It may be mentioned in this connection that Voegtlin and his coworkers maintained that arsenic is detoxified in the body by being coupled with sulfhydryl groups, a reaction which would impair the normal cellular oxidation-reduction mechanism.

A retarding action of arsenic upon three oxidation-reduction systems (hypoxanthine and xanthine oxidase; acetaldehyde, glycine and phosphate; acetaldehyde and colloidal platinum) was reported by Barry, Bunbury and Kennaway. These investigators stated, however, that no direct conclusions can be drawn from in vitro experiments upon biologic processes requiring months and years. Apart from the serious biological and technical objections which may be raised against the method used and the interpretations made by Fischer-Wasels and Büngeler, there remains the outstanding fact that the fermentation theory of carcinogenesis is entirely inadequate to furnish any intelligent explanation for the delayed appearance of the arsenical neoplasms.

This argument also militates strongly against the applicability of the Cohnheim's theory in connection with the causation of arsenical malignancy. In spite of the severe disturbances produced in the melanin metabolism by the influence of arsenic, there has not come to observation a single case of malignant melanoma of the skin originating from an activation of a pigmented or nonpigmented nevus. The alleged metabolic cancerigenic effect of arsenic is unable therefore to stimulate even congenitally misplaced and functionally disturbed embryonic cells into a malignant transformation. The character of the histological changes observed in the epidermis, as well as the site and the multiplicity of the arsenical neoplasms, eliminate the Cohnheim's theory from any serious consideration.

In view of the apparent stimulation of melanin production by arsenicals (Thorne and Myers), Stewart suggested that pigmentary disturbances set up by arsenic might be related to the carcinogenic action exerted by this chemical. A certain amount of support for this hypothesis may come from the fact that melanin contains cyclic hydrocarbons, and that melanosis is a feature common to various other precancerous cutaneous conditions, following upon an exposure to various occupational carcinogenic physical and chemical agents (pitch, tar, crude mineral oil, ultraviolet rays, roentgen-rays, radioactive substances). Ayres and Anderson have pointed out that arsenic seems to have photosensitizing properties, as arsenical eruptions appear first and most pronounced in areas exposed to sunlight, but the development of arsenical malignancy does not depend upon the actions of an actinic factor (Montgomery). The information available at the present time does not permit this hypothesis to be regarded except as an intriguing and interesting supposition.

An analysis of the various factors which may enter in the causation of arsenical neoplasia would be incomplete without mentioning the marked vari-