by diluting it with glycerin. The tarring was discontinued, when an infiltrative growth of the lesions produced was noticed. While 53 per cent of the mice treated with concentrated tar developed neoplasms, the yield of the three series exposed to various dilutions was practically identical (32 per cent, 33 per cent, and 40 per cent, respectively). There was no reduction in preparation time in the three series subjected to diluted tar. These experiments did not confirm completely the observations of Hieger; but Woglom noted that results of unfinished experiments indicated that the critical point of dilution seemed to lie between a 1 per cent and a 10 per cent dilution. Twort and Ing stated that the use of graduated, increasing dilutions of tars or mineral oils, which only contain a relatively small amount of carcinogenic matter, resulted in a more rapid reduction of their carcinogenic potency, than could be expected from the degree of dilution used. It was emphasized by Hieger, on the other hand, that, after the concentration of the carcinogenic agent had passed a certain degree, the neoplastic yield could not be increased and the induction time could not be shortened beyond a certain limit.

These observations stress the importance of prompt removal of tar and pitch from the skin of exposed workers to reduce intensity of exposure, decrease liability to neoplastic reactions, and lengthen exposure time essential for their production. These experimental data agree with clinical observations, inasmuch as occupational tar and pitch cancers are found, most frequently, in those groups of workers who are the most intensely exposed to these agents. They seem to confirm the statement of Kinosita regarding the influence of cleanliness of Japanese tar workers upon the occurrence of occupational tar cancer in Japan.

Interval Between Tarrings. The influence which the length of the interval between individual applications of tar exerts upon the time of onset for the manifestation period was studied by Deelman. This investigator painted with tar from 17 to 22 times six groups of mice, leaving from 1 to 8 days interval between the applications in the different groups. While the time of exposure ranged in the various series from 44 to 140 days, from the start of the experiment, cancers appeared in all groups within 50 to 60 days. The development of the malignant tumor, thus, appeared to be a function of a summation of stimuli. Woglom concluded from this evidence that malignant transformation sets in and proceeds inexorably after the cumulative effect has reached a certain level, whether the irritation is continued or not.

Duration of Tarring. The duration of application of carcinogenic tar to the skin of animals is of essential importance, concerning the incidence and biological character of the ensuing neoplastic responses. Yamagiwa and Itchikawa obtained papillomas in rabbits after painting them every second or third day for 30 to 100 days, and carcinomas resulted when the tarring was continued for 55 to 360 days (150 or more days were required in the majority of cases). By observing special precautions and using massive doses, Itchikawa and Baum