of insulin. With the polarograph, SS as well as SH groups are registered. Based upon the findings of du Vigneaud, it could be assumed that insulin contains SS groups, but no free SH groups.

It is very unlikely that the heat treatment of the insulin samples changed about half of the SS groups to SH groups, and yet the findings do not contradict the assumption that the activity of insulin is related to its SS groups. Many substances contain SS groups without any physiological activity comparable to that of insulin. Inactivated insulin may be one of them. Therefore, it appears that if the SS groups are related to the activity, their presence constitutes but one of a series of conditions which must be fulfilled in order to obtain insulin activity.

Conclusions. 1. The height of polarographic steps of an insulin solution is a function of the concentration of SS (or SH) groups; it is independent of its intrinsic physiologic activity. 2. Polarographic analysis permits the determination of the concentration of insulin solutions, for a given brand, and after calibration.

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Lack of Carcinogenic Potency of Sulfanilamide and Prontosil Soluble in Mice.

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Because of the structural resemblance of sulfanilamide and Prontosil Soluble to o-amido-azotoluol,[1] B-naphthylamine,[2] "light green FS",[3] and other benzene derivatives which have been found to be carcinogenic,[4] the question of possible carcinogenic properties of these compounds naturally arises. Lewis reported on the lack ot carcinogenic potency of sulfanilamide in mice.[5] The present experiments were in progress at that time, and may be considered confirmatory evidence for Lewis's findings.

1 Shear, M. J., *Am. J. Cancer*, 1937, **29**, 269.

2 Hueper, W. C., and Wolfe, H. D., Am. Assn. Pathol. Sci. Proc., *Am. J. Path.*, 1937, **13**, 656.

3 Schiller, W., *Am. J. Cancer*, 1937, **31**, 486.

4 Cook, J. W., and Kennaway, E. L., *Am. J. Cancer*, 1938, **33**, 50.

5 Lewis, M. R., *Am. J. Cancer*, 1938, **34**, 431.

Ninety-seven male mice of the Bar Harbor dba strain, 2 to 3 months old, were used for the experiment. Fifty-two animals were given 40-60 mg injections of sulfanilamide at 2- to 3-week intervals over a 4½ month period, a total of 320 mg for each animal. A 20% finely ground olive oil suspension of sulfanilamide was used, so that a subcutaneous injection of 0.2 cc of suspension into the left axilla represented 40 mg. One mouse died during the injection period. At the end of 12 months, 23 animals were alive and were sacrificed. No gross evidence of tumor was found in any of these mice on postmortem examination, nor in the 27 which died of intercurrent disease over the preceding 6-month period. Microscopic examination of the organs of 10 of these animals showed no abnormal mitotic figures and nothing suggestive of possible malignant change in the liver, kidney, bone marrow, lung or bladder. Small cysts, containing clear fluid, were found near the sites of injection in 14 animals during the injection period, but these all later spontaneously disappeared.

Nineteen mice were injected with Prontosil Soluble,* over a 4½-month period—a total of 400 mg per animal. A warm 20% aqueous solution of Prontosil Soluble powder was prepared, of which each mouse received seven 0.2 or 0.3 cc subcutaneous injections into the left axilla, each injection containing 40 or 60 mg of Prontosil Soluble. Two mice died within 6 hours after injection, apparently of acute toxic effects produced by the Prontosil Soluble. At the end of 9 months, 12 animals were living. Eight mice survived 12 months, and were sacrificed. Postmortem examination showed no gross evidence of tumor in any of the animals. Microscopic examination of the organs of 5 of these mice likewise revealed nothing suggestive of malignant change in the liver, kidney, bone marrow, lung or bladder.

Of 25 control mice, 13 survived a year and showed no evidence of tumor. The mortality from intercurrent disease in the sulfanilamide group, the Prontosil Soluble group, and the control group over a year's time, was about the same.

Summary. Repeated subcutaneous injections of sulfanilamide and Prontosil Soluble in mice over a period of one year failed to produce tumors in these animals.

* The Prontosil Soluble and sulfanilamide were furnished in powder form through the courtesy of the Winthrop Chemical Company. Prontosil Soluble is disodium 4′ sulphonamide benzene-2-azo-7-acetyl-amino-1-hydroxy-naphthalene-3-6-disulphonate.