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# Action of Trichlorethylene on Perfused Vessels of the Frog.

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Trichlorethylene has had a rather extensive use in the treatment of trigeminal neuralgia since the work of Plessner.[1] Very recently, William Love, Jr., of the Department of Medicine of this university called to our attention the fact that he had successfully treated several cases of angina pectoris by the inhalation of trichlorethylene. Having been interested in the wide use of tissue extracts[2] in the treatment of angio-spastic diseases, the authors thought it would be of interest to study the action of trichlorethylene on the blood vessels and compare it with tissue extract used clinically in the treatment of the same disease.

The experimental procedure developed by Läwen[3] and Trendelenburg[4] for perfusing the vessels of frog's legs was employed. All observations were made during the first 30 minutes of the perfusion. The trichlorethylene was supplied through the courtesy of the Calco Chemical Company and met the requirements set forth by Tschentke.[5] A freshly prepared saturated solution of the substance

TABLE I.

| Frog No. | Control Drops per min. | Trichlorethylene 1.5 cc. sat. soln. Drops per min. | Tissue Extract 0.5 cc. Drops per min. | Trichlorethylene 1.5 cc. sat. soln. Drops per min. |
|---|---|---|---|---|
| 1 | 16 | 3 | 14 | 4 |
| 2 | 21 | 2 | 12 | 3 |
| 3 | 21 | 4 | 19 | 4 |
| 4 | 9 | 1 | 6 | 1 |
| 5 | 27 | 2 | 19 | 11 |
| 6 | 24 | 5 | 6 | 2 |
| 7 | 16 | 2 | | |
| 8 | 4 | 2 | | |
| 9 | 21 | 9 | 4 | 1 |
| 10 | 14 | 3 | 4 | 1 |
| 11 | 16 | 7 | 19 | 4 |
| 12 | 10 | 2 | | |

1 Plessner, W., *Klin. Wchschr.*, 1916, **53**, 25.

2 Carr, C. J., Schmidt, J. E., Harne, W. G., and Krantz, J. C., Jr., *J. Pharm. and Exp. Therap.*, 1934, **50**, 151

3 Läwen, A., *Arch. Exp. Path. Pharm.*, 1904, **51**, 416. Through Sollmann and Hanzlik.

4 Trendelenburg, P., *Arch. Exp. Path. Pharm.*, 1910, **63**, 165. Through Sollmann and Hanzlik.

5 Tschentke, H. L., *Ind. Eng. Chem. Analyt. Ed.*, 1934, **6**, 21.

in Ringer's solution was employed. The tissue extract was an insulin-free pancreatic extract supplied by Sharp and Dohme, marketed under the name of "Tissue Extract No. 568".

The results of 12 experiments are shown in Table I.

*Discussion.* Saturated solutions of chloroform in Ringer's solution produced only a slight constricting effect. After the vessels failed to respond any longer to the effect of trichlorethylene, epinephrine solution produced a marked constriction. After tissue extract, pitressin produced no significant constriction of the vessels; but the subsequent administration of trichlorethylene produced marked constriction.

*Summary.* It is of interest that these therapeutic agents used in the treatment of angio-spastic disease should antagonize the action of each other on the blood vessels of the frog.

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## Reaction of Trichloracetic Acid and of Chloral Hydrate with Carotene.*

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Trichloracetic acetic acid (9 parts by weight of the crystallized acid and one part of water) gives immediately with carotene in chloroform solution an intense blue color. The reaction develops without the aid of external heat. Three drops of trichloracetic acid solution are mixed with 0.1 cc. of chloroform solution of carotene in order to develop the reaction. The color fades on the addition of water or of alcohol, but not on heating. Spectroscopic examination reveals absorption beginning at 640mμ and continuing to the end of the visible spectrum.

Carotene in solid form on exposure to air and sunlight changes from copper-colored crystals to a light brown powder. When kept in chloroform solution in a glass bottle exposed to sunlight the deep golden yellow color gradually changes to a light yellow brown. Solid

*The carotene used was obtained from the S.M.A. Corporation, Cleveland. It contains β-carotene and a small quantity of α-carotene. Cerevisterol and ergosterol-free cholesterol were obtained from Dr. Charles E. Bills, Director of Researeh, Mead Johnson and Company, Evansville, Indiana.