of the experiments leading to these conclusions certain observations were made on excitability which were not published at that time.

In these experiments ventricular strips were caused to contract rhythmically by the application of electrical stimuli. It was found that when an extra contraction was produced following one of the regular rhythmical responses (by the introduction of an extra stimulus), the absolute refractory period following this contraction is shorter than that following the regular rhythmical contractions. As an example: Ventricular strip responding rhythmically every 4.4 seconds. Very strong stimuli ineffective during interval of 2.1 seconds following the rhythmic responses. Response obtained at 2.2 seconds after one of the regular contractions. Following this response another was elicited with the same strength of stimulus after only 2.0 seconds.

The foregoing experiment indicates that the recovery of excitability is more rapid after 2 contractions which follow closely upon each other than when these contractions are separated by a longer interval of time. Thus it appears that the rate of recovery of excitability depends upon the interval between preceding contractions. These findings parallel those for the mechanical responses,[2] and are quite in accord with those of Ashman and Hafkesbring.

Further experiments are in progress which it is hoped may assist in the explanation of the treppe in excitability and the summation of stimuli.

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Iodine Poisoning Counteracted by Thiosulphate.

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Sabbatini[1] called attention to the action of thiosulphate of sodium in removing the stain of iodine from the skin. Thiosulphate is a component of the relatively non-toxic, so called colorless tincture of iodine. Its ability to bind with iodine apparently takes precedence over the combination iodine forms with the protein of the tissues. Sollmann[2] has reported upon "The Fate of Iodin, Iodids and Iodates in the Body," showing that free iodine is promptly bound and circulates as iodide, bound through protein. The possibility is pre-

[1] Sabbatini, L., *Gaz. Osp. e Clin.*, 1912, xxxiii, 58.

[2] Sollmann, T., *J. Pharm. and Exp. Ther.*, 1917, ix, 269.

sented of thiosulphate combining with iodine absorbed and circulated in protein combination in a manner similar to that observed in superficial tissue.

Boehm[3] has shown that dogs injected intravenously with a lethal quantity of compound solution of iodine (40 mgm. per kilo) exhibit no symptoms of toxicity for a period of 4 to 6 hours. Death is usually delayed for many hours. Pathology due to the iodine, found at autopsy, is produced in similar manner by iodide of sodium. In fatal iodine poisoning in man, death is usually delayed over a period of 24 to 48 hours, offering a favorable time interval for effective intervention.

Rabbits were injected subcutaneously with tincture of iodine, diluted to one-third strength with water, at the time of injection. The minimal lethal dose was found to be 0.175 to 0.180 gm. per kilo. No rabbit receiving more than the latter amount survived. Thiosulphate of sodium in 10% strength produced no toxic symptoms in dosage of 3.0 gm. per kilo, subcutaneously injected.

The iodine solution was injected beneath the skin of one lateral half of the body, thiosulphate solution subcutaneously on the opposite side.

Rabbits injected with twice the lethal dose of iodine exhibited but slight evidences of toxicity when thiosulphate was used. It was found advisable to give small amounts of thiosulphate by stomach tube at intervals of 3 or 4 hours during the first 12 to 15 hours of the poisoning, to avoid inflammation of the gastric mucosa. Food was then accepted readily. Thiosulphate injected intravenously caused rapid disappearance of symptoms of toxicity. Best results were obtained by combining subcutaneous, oral and intravenous methods of administration. The dosage of iodine was increased to 0.450 gm. with recovery. Iodide of potassium, as a constituent of the tincture was present in the amount of 0.321 gm. additional to the iodine. No attempt was made to increase the dose of iodine above this amount.

[3] Boehm, R., *Arch. f. Exp. Path. u. Pharm.*, 1876, v, 329.