

xanthin is very slightly soluble nevertheless even very minute quantities of the substance (1 c.c. of 1-200,000 solution) introduced into 25 c.c. of Locke's solutions in which the preparation was suspended were found to produce a very marked relaxation. Hypoxanthin acted in the same way. Going a step further experiments were made with minute quantities of guanidin and adenin and both of these were found to produce relaxation of the bronchus and seemed to be comparatively more potent even than xanthin. Passing to the nucleosid guanosin, the pharmacological action became different. Guanosin produced no effect. A few experiments with adenin nucleotid showed that it also was inactive. Finally tests made with solutions of thymus nucleic acid and yeast nucleic acid gave also no effect on the bronchial muscle.

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**Effect of cocaine on the growth of lupinus alba: a contribution to  
"phytopharmacology."**

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The effects of cocaine and its decomposition products were studied on the growth of seedlings of the plant *Lupinus alba*. The seeds were soaked in water and allowed to sprout in a suitable medium, following which the length of the straight roots grown by this plant was measured and the effects of cocaine and other chemicals on the growth of the roots were investigated. The plants were placed in solutions of nutrient salts (Shive solution) and the various drugs were added to such solutions. Controls were made on seedlings suspended in Shive solution diluted one half with distilled water. It was found that the effect of cocaine and its decomposition products on the growth of lupinus was very different from the effect of the same substances on animal tissues. Whereas cocaine is very toxic for animal tissues such as smooth and skeletal muscle, nerves, etc., it required strong solutions of this alkaloid, namely 2 per cent. of cocaine hydrochloride to inhibit

the growth of the seedlings. Ecgonin hydrochloride inhibited growth in concentrations of .0055 per cent., while benzoyl ecgonin was much less toxic, requiring  $2\frac{1}{2}$  per cent. concentration to affect the growth. Methyl alcohol was found to be very little toxic to the roots of the lupinus, requiring 4.8 per cent. to produce an inhibition of growth. Contrary to expectation the most toxic decomposition product of cocaine was found to be sodium benzoate, a compound which is practically non-toxic for animal tissues. Sodium benzoate was found to be deleterious to the lupinus root in concentrations of 0.007 per cent.; while the ester methyl-benzoate was found to produce inhibition in concentrations of 0.014 per cent. Various simple mixtures of ecgonin, sodium benzoate, methyl alcohol, benzoyl ecgonin, etc., were also studied and the effects of these will be described in the complete paper in the Journal of General Physiology.

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#### **Spontaneous cure of rickets in rats.**

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It has long been believed that in infants healing of rickets occurs in spite of the diet and environment remaining unchanged. Some time ago in the course of an experiment on the curative effect of sunlight in the rickets of rats, it was observed that rickets healed in two of the control animals. One of these rats was on the Sherman and Pappenheimer diet plus 25 mg. P. per cent. and the other on the same diet with an addition of 50 mg. P. per cent. The rats weighed 34 g. at the outset, and after 30 days showed rickets by x-ray. After 62 days the radiograph was negative in one instance and demonstrated healing in the other. Autopsies of both revealed no gross rachitic changes; microscopic examination showed healed rickets at the costo-chondral junctions in one instance, in the other no rickets was found but some autolysis had taken place.