trollable movements of the head and neck were observed. Convulsions were observed in 9 out of 32 poults and largely resembled those already reported for the chick.[6]

Two convulsions in each of 3 poults followed a somewhat different pattern prior to death. These resembled the convulsions seen in acute strychnine poisoning. At the start the poults were in a comatose state lying on their sides. A fine tremor of the feet was noticed which increased in severity. Suddenly the neck would arch until the head touched the back, the legs assumed extreme extension, and the whole body became rigid and in opisthotonos. Respiratory movements ceased during such an attack. After an interval of approximately one-half minute, the poult would relax and respiratory movements would begin. After these seizures the poults were completely exhausted. In each case the poult died during the second observed convulsion. Several poults on the deficient diet were found dead with this characteristic curve of the neck with the head arched toward the back. They may have died in convulsions but such were not observed. None of these convulsions could be elicited but appeared spontaneously. These observations indicate that the effects of pyridoxine deficiency on poults are similar to those reported for chicks.[6] In turkeys, convulsions are followed by death much more quickly than in chicks.

Poults receiving the basal diet plus 3.0 mg pyridoxine per kilo of diet were normal in appearance and grew at a rate which approximated 85% of the growth of poults on the turkey starting mash.

Summary. Pyridoxine deficiency in turkeys is characterized by loss of appetite, poor growth, apathy, hyperexcitability when disturbed, convulsions, and death. Pyridoxine prevented the deficiency symptoms.

14017

Further Studies on Properties of the Gastric Secretory Depressant in Gastric Juice.*

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A gastric secretory depressant has been observed in acid gastric juice of both humans and dogs. In patients with achlorhydria and gastric carcinoma or pernicious anemia, this factor is present in relatively high concentration.[1] This factor is contained in the flocculent precipitate obtained by addition of 4 volumes of absolute alcohol to neutralized gastric juice. About 1 g of precipitate obtains from a liter of juice. Three hundred to 500 mg of the precipitate, suspended in saline and injected intravenously into gastric pouch dogs fed meat, affords consistently an achlorhydria of the pouch lasting at least 2½ hr.

Alkalinization of a suspension of the precipitate results in solution of the latter, which however reprecipitates with acidification (pH 5 to 6). This second precipitate is inactive as far as the gastric secretory depressant is concerned, as is also the supernatant fluid, hence alkalinization destroys the depressant factor. Five hundred mg of active precipitate were suspended in 20 cc of N/10 N HCl and U.S.P. pepsin added to .2% concentration. After incubation for 24 hr at 37°C no decrease in the potency of the gastric secretory depressant factor was noted. Longer periods of incubation resulted in decreased potency of the factor.

The question is raised if the gastric secre-

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1 Brunschwig, A., Schmitz, R. L., Rasmussen, R., *J. Nat. Cancer Inst.*, 1941, **1**, 481.

tory depressant factor in gastric juice is identical with that factor described as "urogastrone" and obtained from the urine. Gray[2] reported the consistent recovery of this gastric secretory depressant factor from urine by precipitation with benzoic acid, extraction with acid-aqueous-acetone and reprecipitation with alcohol-aniline-acetone.

One gram quantities of 80% alcohol precipitates of human gastric juice, 300 to 500 mg of which, as stated, always produced prolonged achlorhydrias in the stimulated gastric pouch, were extracted twice with 20 cc of 70% acid acetone (1 cc concentrated HCl per 100 cc solution) and these combined. The latter were then treated with one volume of absolute alcohol, 3 cc of aniline and 3 volumes of absolute acetone (Gray's method): this afforded a flocculent precipitate which was separated by centrifugation and dried. This precipitate weighing about 300 mg was found to be soluble in slightly acidified normal saline solution, and when injected into pouched dogs failed to produce achlorhydria on 8 separate occasions.

The residue of the original alcohol precipitate of gastric juice which was insoluble in 70% acid acetone was suspended in 20 cc of slightly acidified normal saline and injected into pouched dogs. In each of 6 separate experiments achlorhydria of the stimulated pouch, lasting over 2½ hr, obtained.

Conclusions. A method for extraction of the gastric secretory depressant factor from urine (urogastrone) does not extract the gastric secretory depressant from an alcohol precipitate of human gastric juice, hence evidence is offered that these two factors are not identical.

[2] Gray, J. S., *et al.*, *Endocrinology*, 1942, **30**, 129.

14018 P

Observations on the Intravenous Injection of Gelatin for Nutritional Purposes.*

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In view of the recent interest in parenteral injection of nitrogenous nutriment, the question of nutritive value of gelatin injected intravenously is being investigated. Observations of this type apparently have not been hitherto recorded. Such a study is complicated by the heterogeneous nature of gelatin. The sample employed in this study was designated as 3 Cu, and consisted of a light brown moderately coarse powder. Aqueous solutions were prepared by adding 120 to 125 g to 1000 cc of hot water. This was autoclaved at 15 pounds pressure and 250°F for 45 min prior to injections in animals. Total nitrogen determinations were made on each sample and this data employed to calculate nitrogen intake. Non-protein nitrogen varied widely in the several liter samples prepared, the maximum in one sample being 570 mg % but in most others it was under 100 mg %. This gelatin was found to contain no cystein or tryptophane and .8% tyrosin (analyses by Mr. Carter Johnston, Department of Biochemistry).

Dogs depleted of protein stores by maintenance on a Weech diet[1] for about one month received 150 cc of the gelatin solution (which was approximately 12% by weight) a day intravenously as the sole source of protein. During the injection period Weech diet was afforded *ad libitum* but the appetite varied widely. Urine (and feces) was collected every 24 hr and the daily loss of

* This work was conducted under a grant from the Edible Gelatin Manufacturers' Research Society.

[1] Weech, A., *et al.*, *J. Exp. Med.*, 1935, **61**, 299. (505 g of diet contains 1.23 g N.)