1:10,000, except in one instance a fish finally died in a 1:1000 solution of arasaponin A.

Summary. The pharmacologic action of arasaponins A and B, isolated from the Chinese drug San-ch'i, has been investigated. Arasaponin A possesses a hemolytic action on the erythrocytes of guinea pigs, dogs, and monkeys. It has a minimal lethal dose of 460 mg. per kg. in mice by intravenous injection. Arasaponin B has a hemolytic action upon the red blood cells of guinea pigs, dogs, and rabbits. Its minimal lethal dose in mice is 300 mg. per kg. when injected by the tail vein.

9244

Prolonged Splanchnic Stimulation.*

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An attempt was made to determine the effect of prolonged bilateral electrical stimulation of the splanchnic pathways of a dog upon the level of systolic blood pressure.

Blood pressure records were made by connecting a van Leersum carotid flap to a "Tycos" recording sphygmomanometer by means of especially constructed rubber bags and rigid tubing. The method has been checked against optical manometry and gives results consistently about 10% high; more than 2000 determinations in 8 dogs convinced us of its efficiency.

Stimulation was provided by a method involving the use of surgically implanted secondary units excited by a primary field in which the animal is free to move.[1] A frequency of 60 cycles was used at 6-8 volts.

Following construction of a carotid flap the subject, a robust 12-kilo male terrier, was trained over a period of several weeks to lie quietly during blood pressure determinations. In the following 3 weeks 89 records were made to serve as a base line. The average systolic pressure during this time was 143 mm. Hg. (all figures refer to records obtained by our method). Then and subsequently, except when the conditions of an intercurrent experiment dictated other-

* Work done as Fellow of the Rockefeller Foundation. Financed by grants from the Committee on Scientific Research of the American Medical Association.

1 Fender, Frederick A., *Am. J. Physiol.*, 1936, **116**, 47.

wise the systolic pressure for any one time was considered to be the average of 4 records with a "spread" of less than 15 mm. Hg. The average deviation of the daily levels, obtained in this way, from the period average, was 2.5 mm. Hg.

November 4, 1935, a secondary unit with bipolar electrodes loosely encircling the splanchnic nerve just above the diaphragm, was implanted on each side. On the fourth postoperative day a second control period of 22 days began. Eighty-four determinations in this period varied between 146 and 166 with an average of 156 mm. Hg. The slight rise was thought to be due to mechanical irritation of the splanchnics, as there was no indication of discomfort.

Preliminary tests showed that stimulation (animal in cage) resulted in agitation and in a sharp rise in systolic level. The week of December 2-9, short periods of stimulation were used. Records made before the animal was put in the cage for stimulation averaged 141 mm. Hg. for the week. Records made at least 2 hours after one-second periods of stimulation averaged 163 mm. Hg.

Stimulation was then increased so as to keep the subject's systolic blood pressure elevated throughout the day. For 5½ months the subject's systolic level was kept elevated 8 hours a day, 6 days a week. This level varied between 160 and 200 mm. Hg., with an approximate average of 175. In addition to daily routine determinations, frequent checks carried out during the "stimulation day", and the conduct of the animal under stimulation, satisfied us that a real elevation was maintained.

Stimulation was always followed by agitation as well as by an increase in blood pressure. However, 2 experiments under completely effective pentobarbital anesthesia in which sharp elevations of from 25 to 30 mm. Hg. were obtained with stimulation, showed that the effect was not wholly due to emotional factors.

In spite of the continued elevations during the day, the animal's systolic level did not remain elevated without stimulation. The last 16 morning determinations, made May 11 to 16 before the animal entered the cage, ranged from 120 to 137 mm. Hg. with an average of 128.

May 23, 1936, it was noticed that the animal could avoid stimulation partially by selecting a certain position in the cage, and it was suspected that one of the coils had ceased to function. This proved to be the case at autopsy, May 29, when it was found that a terminal on the right coil had parted. The sympathetic trunks and splanchnic nerves showed no evidence of trauma, and a careful examination of the organs by Dr. Klaus Rosencrans, especially inter-

ested in the pathology of hypertension, showed no significant departure from the normal.

Throughout the experiment the animal's blood urea level was followed at weekly intervals. There was no change. Dr. David Rytand made repeated examinations of the urine without discovering significant changes.

Conclusion. The systolic blood pressure of a dog was maintained at an elevated level 8 hours a day, 6 days a week, for 5½ months without producing any lasting effect on the resting level.

9245 P

Synthesis of Octopine (Pectenine).

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The compound isolated by Moore and Wilson[1] from Pecten muscle and called pectenine by them is probably identical with octopine previously isolated by Morizawa.[2] The arguments in favor of this statement will be given in a forthcoming publication.

Octopine was characterized by Moore and Wilson and, on evidence which was not quite complete, they concluded that the compound is probably arginine, the α-amino group of which is attached to the α-carbon atom of propionic acid. In order to confirm this conclusion a synthesis has been carried out as follows[3]: d-arginine methyl ester dihydrochloride was treated with the ethyl ester of d-l, α-bromopropionic acid in absolute ethyl alcohol containing a little zinc dust and potassium iodide. Two equivalents of sodium ethylate were added at once and another equivalent added during the early part of the period of boiling which was continued for 24 hours. The esters were hydrolyzed with acid and the material was precipitated by silver and baryta. After decomposing the precipitate, the small amount of arginine was removed with flavianic acid and a picrate was obtained from the filtrate after extraction of the flavianic acid.

The recrystallized picrate melted with decomposition at 219°.

1 Moore, E., and Wilson, D. W., *J. Biol. Chem.*, 1934, **105**, lxiii; *Am. J. Med. Sci.*, 1935, **190**, 143; *J. Biol. Chem.*, 1936, **114**, lxxi.

2 Morizawa, K., *Acta Scholæ Med. Kioto*, 1927, **9**, 285.

3 Ruzicka, L., and Fornasir, V., *Helv. Chim. Acta*, 1920, **3**, 806.