excluded by various chemical and physiological tests. Search was also made for a radio-active substance. Chemists had called attention to the abundance of calcium in the ash; this and strontium were excluded from being the toxic agents.

Finally Crawford noticed that extracts prepared with sulphuric acid were inactive; further, that active extracts caused a rise of blood-pressure. Both of these observations suggested the presence of barium. After a long series of careful experiments the author reached the following conclusions:

A close analogy exists between the clinical symptoms and pathological findings in barium poisoning and those resulting from feeding extracts of certain loco plants. Small doses of barium salts may be administered to rabbits without apparent effect, but suddenly acute symptoms set in analogous to what is reported on the range.

Finally barium was found in the ash of many "loco" plants in amounts sufficient to account for the symptoms.

Among the other important conclusions, some of which help to explain the unsatisfactory results of former workers, are the following:

Loco plants grown on certain soils are inactive pharmacologically and contain no barium. In drying certain loco plants the barium apparently is rendered insoluble so that it is not extracted by water, but can usually be extracted by digestion with the digestive ferments.

The barium to be harmful must be in such a form as to be dissolved out by digestion.

In deciding whether plants are poisonous it is desirable not merely to test the aqueous or alcoholic extract, but also the extracts obtained by digesting these plants with the ferments which occur in the gastro-intestinal tract.

These experiments afford another illustration of how indispensable are animal experiments in all kinds of pharmacological work.

The author conservatively limits his conclusions to the plants he has studied, and recognized that in the plants grown in other localities the toxic action may be due to substances other than barium.

There is an extraordinarily rich and well-selected bibliography of the entire subject of "loco" and also of barium poisoning in both man and the domestic animals.

It seldom falls to the lot of an investigator to carry to such a successful conclusion a problem of such complexity and so baffling; it will long remain as one of the most notable contributions to pharmacology made here or abroad.

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SPECIAL ARTICLES

THE EFFECT OF LESIONS OF THE DORSAL NERVE ROOTS ON THE REFLEX EXCITABILITY OF THE SPINAL CORD (PRELIMINARY NOTE)[1]

IN some preliminary experiments Professor Carlson found that lesions of the dorsal nerve roots appear to have the same effect on the cross reflexes of the spinal cord as transsection of the cord itself. That is, in animals in which the reflexes disappear temporarily after transsection of the cord (spinal shock) the cross reflexes are similarly lost temporarily after lesions of the dorsal nerve roots on one side.

The experiments here reported were undertaken at the suggestion of Professor Carlson in order to determine definitely this parallelism in different animals, because of the important bearing of these results on the theories of spinal shock.

Methods of Experiments.—Section of the dorsal nerve roots to one limb: (*a*) After high section of the spinal cord, (*b*) on the intact animal.

In pigeons, cats and dogs after the high section and recovery from shock and anæsthesia (usually one day) the final operation of cutting the dorsal nerve roots was made without anæsthesia.

Results of Experiments.—The effect on the cross reflexes caused by the cutting of the dorsal roots to a limb is as follows: In snapping turtles, loss of cross reflexes for 5–10 minutes; in frogs, loss of cross reflexes for 15–30 minutes; in pigeons, no loss of reflexes;

[1] From the Hull Laboratory of Physiology, University of Chicago.

in cats (young) loss of reflexes for 30–40 minutes; in cats (old) loss of reflexes for 50–70 minutes; in dogs, loss of reflexes for 75–90 minutes.

In the turtle transverse lesion of the cord usually does not abolish the reflexes except momentarily. This is also true for the pigeon. In other words, lesions of the dorsal roots produce the same shock effects on the spinal reflex mechanism of the limb involved as transverse lesion of the cord itself.

The present theories of spinal shock may be summarized under three heads, viz., (*a*) inhibition due to the trauma; (*b*) loss of tonus impulses to the reflex centers; and (*c*) lesions of the reflex arcs themselves.

The last theory is not applicable to these results. Either one or both of the other two may be applicable to the results here reported. That is the shock may be due to the temporary effect of absence of tonus impulses, or to irritation of inhibitory nerves, or to both of these.

The work is being continued with the purpose of determining this point.

Clyde Brooks

A NOTE ON THE OCCURRENCE OF TWO WEST INDIAN FISHES AT BEAUFORT, N. C.

During August, 1907, the writer collected in the harbor of Beaufort, N. C., two fishes which are for the first time reported from this locality. Both forms are of the tropical and subtropical faunas. A small specimen of *Abudeduf saxatilis* Linn., was seined August 10, 1907, at the Fort Macon jetties. Its length is 2.25 inches. The other form is *Ulæma lefroyi* Goode. A number of these were taken in a dipnet at Pivers Island, August 3, 1907. The smallest fish measured 0.40 inch in length, the largest 0.52 inch.

In order to ascertain the identity of these small fish, which had evidently been hatched only a few days prior to their capture, they were placed in an aquarium of running sea water, and there they were successfully reared. During the first week they were fed on copepods and larval crustaceans which were strained from the tow; this food was then changed to grated oyster on which they thrived vigorously. September 2, 1907, the smallest *Ulæma* measured 0.91 inch in length, the largest 1.12 inches; the rate of increase in length averaged 120 per cent. This method of rearing fry was employed this season for *Fundulus majalis*, which were hatched in the laboratory from eggs which had been artificially fertilized. The young *Fundulus* were reared until they had attained a length of 0.75 inch, when an accidental overflow of the aquarium permitted the fish to escape.

On August 21, 1908, on the landward side of one of the large shoals in the harbor, numbers of small specimens of *Ulæma lefroyi* were collected in a small seine of fine mesh.

For the opportunity of making these observations the writer is indebted to the Hon. Geo. M. Bowers, U. S. Commissioner of Fisheries.

Bartgis McGlone

St. John's College,
Annapolis, Md.,
September 1, 1908

CATALYTIC REDUCTION OF FATS AND OILS

About four years ago it was shown by Paal and Amberger[1] that palladium could be obtained in a particularly active colloidal aqueous solution (hydrosol). Subsequently the senior author demonstrated[2] that this liquid, in presence of hydrogen, was capable of causing the catalytic reduction of nitrobenzene. The work has now been extended to include certain other substances,[3] the most generally interesting of which are oleic acid and a number of oils.[4]

The acid, in the form of its potassium salt, is dissolved in water and mixed with a small quantity of the palladium solution; the liquid being then introduced into a gas-burette containing hydrogen, standing over mercury. Absorption of the gas commences immediately and the reaction is completed in a few hours. No heating is required. Oleic acid, under these conditions, is converted almost quantitatively into stearic acid. Castor oil, dis-

[1] *Ber.*, **37**, 124 (1904); **38**, 1398 (1905).
[2] *Ibid.*, **38**, 1406, 2414 (1905); **40**, 2209 (1907).
[3] *Ibid.*, **41**, 2273.
[4] *Ibid.*, **41**, 2282 (1908).