ERRATUM

Article 7147, Kramer and Schaeffer, on Experimental Poliomyelitis, last line of the table should read, " .5 cc. serums of 8 out of 9 monkeys neutralized, etc."

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7193 P*

Akee Poisoning.

EDWIN O. JORDAN AND WILLIAM BURROWS.

From the Department of Hygiene and Bacteriology, The University of Chicago.

An illness on the island of Jamaica known locally as "vomiting sickness" is thought to be, at least in some cases, a form of poisoning caused by eating the fruit of the akee *(Blighia sapida)*. Although it is probably true that the name "vomiting sickness" has been applied to etiologically unrelated affections, there is strong evidence[1] implicating the akee in a serious and frequently fatal sickness. Deaths after eating akees are seemingly reported sometimes as vomiting sickness, sometimes as akee poisoning. The total deaths registered annually in recent years under these designations have run as high as 350 (1921). The akee in an immature or unripe condition has been reputed to be particularly dangerous.

* P represents a preliminary, C a complete manuscript.

[1] Scott, H. H., *Ann. Trop. Med. and Parasit.*, 1916, **10**, 1.

Considerable unwillingness to accept these conclusions has been manifest, chiefly on the ground that the akee is a common market article in Kingston and elsewhere in Jamaica, and, in its season (November-March), is eaten daily by hundreds, probably by thousands, of persons with perfect impunity. It is also pointed out that with the improvement in water supplies that has taken place in several localities the "vomiting sickness" has greatly declined.

The edible portion of the akee is the arillus, a fleshy envelope attached to the seed. Arilli boiled or fried have been repeatedly eaten by one of us (E.O.J.) as by other Americans and European residents in Jamaica without any sign of discomfort or injury.

Through the kindness of Dr. B. E. Washburn, representative of the International Health Division of the Rockefeller Foundation in Jamaica, we have been able to secure a considerable number of akees in various stages of development. No signs of illness have been observed in experimental animals (cats and monkeys) fed with the arillus alone. The seeds, however, in both the ripe and unripe fruits contain a water-soluble poison which affects cats and monkeys, causing serious vomiting, and occasionally death when a large amount is given. The ovary wall or husk of the fruit also contains a toxic substance that is extracted with boiling water. When the whole fruit is chopped fine and extracted with boiling water, the extracts from both ripe and unripe fruits are poisonous.

The poisonous substance may be conveniently extracted by boiling the whole fruit, or the proper parts, in water for from 30 minutes to 2 hours. The seed extracts are composed, for the most part, of starch and a substance which hydrolyzes to a reducing sugar. The starch may be precipitated by the addition of alcohol. The poisonous substance remains in solution. The starch-free solution contains only a trace of reducing substances but gives a strongly positive Molisch test. After boiling in dilute hydrochloric acid solution the filtrate strongly reduces alkaline copper and picric acid. Ferric chloride and Millon's reaction are negative. Cyanide could not be detected. The evidence suggests that the poisonous substance accompanies a glucoside present in certain portions of the akee.

The explanation of the apparent epidemiological difference observed between the ripe and unripe fruit in Jamaica seems to be that in the latter the seed is small, soft and embedded in the arillus, while in the ripe fruit the large, dark brown, conspicuous seed has a hard shell and is easily removed from the edible portion. The placenta which attaches the arillus to the husk is also not readily removed from the unripe fruit, and is locally regarded in Jamaica as poison-

ous. We have not, however, been able to produce any illness in cats or a monkey by feeding them with placental extract. It is a reasonable explanation that in the country districts of Jamaica, where most of the reported cases of akee poisoning have occurred, akees that have fallen to the ground before ripening and those taken immature from the tree have not had the small seeds removed before eating. It is significant that many of the reported cases of akee poisoning have occurred in children, and that the "soup" made by boiling akees with various vegetables has a poisonous quality.

Although there can be no doubt that some of the cases of the vomiting sickness of Jamaica are caused by akee poisoning, the proportion of such cases in any particular time or locality can naturally not be determined without specific investigation.

Further experiments on the nature and action of the akee poison are in progress.

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Effect of Experimental Hyperparathyroidism on the Incisor of the Rat.*

I. SCHOUR, W. R. TWEEDY AND F. A. MC JUNKIN.

From the Department of Histology, University of Illinois, College of Dentistry, and the Departments of Biochemistry and Pathology, Loyola University School of Medicine.

The microscopic anatomy of the incisors was studied in 2 groups of rats:

A. 29 rats that were given 1 to 15 injections of parathyroid hormone. Doses varied from 10 to 150 units. Weight: 85-145 gm.
B. 7 controls from same colony.

Significant alterations were observed only in Group A: 1. Enamel hypoplasia was found to be formed at the time of the first injection in 5 animals. 2. The alveolar bone showed an abnormal increase in osteoclasts in 14 and a fibrous change of the bone marrow in 3 of the animals that were given 3 or more injections of parathyroid hormone. 3. The principal changes were found in the dentin. Each experimental animal showed a primary hypocalcified stripe in the

* The preparation of a portion of the hormone used in this report was aided by a grant from the Committee on Scientific Research of the American Medical Association to W. R. T. and by a supply of parathormone to F. A. McJ. from Lilly & Company.