greenish-blue color. No further change was noticed until the third day, about seventy-one hours after the bite, when the snake was found bleeding from the mouth with its head inclining over the edge of an empty water pan into which approximately 20 cc of bloody fluid had fallen. It was very sluggish and responded only slightly when touched. When removed from the cage and examined, it was evidently almost dead. Occasional spasmodic twitchings of small portions of the body occurred, however, over a subsequent period of two and a half hours.

Post-mortem examination of the region of the bite revealed much discoloration, extravasation of blood and lymph, and evidence of general histolysis in all tissues of the body wall. Extending along the left side of the body cavity adjacent to the lung was another area which seemed to have been attacked by venom from another bite which probably occurred as the rattlesnake was being replaced in the box. Marked histolysis was evident in this region also. The lung was filled with blood which did not coagulate, extravasation in this organ being responsible for the bleeding at the mouth before death.

Almost every one who has kept living venomous snakes for study has observed that on occasion they fortuitously bite themselves or others of their own or closely related species without the occurrence of noticeable reactions. I have seen a timber rattlesnake, *Crotalus horridus* Linn., sink its fangs deeply into its own writhing body when pinned to the ground by a collecting hook; a western diamond rattlesnake, *Crotalus atrox* Baird and Girard, bite another of its own species, giving it two powerful strikes in quick succession; and a prairie rattlesnake, *Crotalus confluentus confluentus* (Say), bitten by a copperhead, *Agkistrodon mokasen* Beauvois, the fangs penetrating deeply enough to cause a distinct flow of blood from the wounds. Each of these snakes was examined frequently during the two or three days following the bites and none suffered apparent effect.

From the fact that the cottonmouth moccasin feeds very largely upon more or less aquatic, cold-blooded prey, it is perhaps to be expected that its venom would prove to be more toxic to other crotalids than that of species feeding chiefly or exclusively upon warm-blooded animals.

It is unfortunate that on a matter of so much popular interest so little definite knowledge exists. Some carefully controlled experiments by a properly qualified and adequately equipped investigator could be expected to produce interesting and useful results.

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THE EFFECT OF MORPHINE ON THE ANAL SPHINCTERS

IT is a well-known fact that moderate doses of morphine produce sustained contractions of the cardiac and pyloric sphincters of the stomach and of the sphincter of the urinary bladder. We could not find any data in the literature relative to morphine action on the internal and external sphincters of the anus.

In three cats and three dogs it was shown that doses of morphine varying from three to ten mgm per kgm of body weight administered intravenously produced marked and sustained contractions of both sphincters of the anus. The animals were under moderate ether anesthesia, the trachea clamped, and thus asphyxia was produced with simultaneous relaxation of the sphincters ani. This relaxation is maintained for some time after the animals are again allowed to breathe. However, if the animals had received morphine previously, there was either no or only an evanescent relaxation of the sphincters during and after asphyxia.

Double vagotomy had no influence on the effect of morphine on the sphincters, nor did the high thoracic transection of the cord at the level of the second thoracic vertebra prevent the contraction of the relaxed sphincters upon the administration of morphine. In one dog with high thoracic transection of the cord following morphine administration the relaxed sphincters immediately contracted but relaxed again upon induction of asphyxia.

These results might have some bearing on certain surgical routine procedures and throw doubt on the reliability of the state of the anal sphincters as an indication of the degree of anesthesia following premedication with morphine.

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QUOTATIONS

SIR WALTER FLETCHER

BY the death of Sir Walter Fletcher this country has lost one of the most devoted and most distinguished of its public servants. Alone, perhaps, among his contemporaries Fletcher recognized fully the need which existed for organization in the field of medical research. The opportunity to effect this organization came to him with his appointment as secretary of the newly constituted Medical Research

Committee, and he made of that committee, in the space of a few years, one of the most distinguished and useful bodies in the Empire. When the committee was transformed into the Medical Research Council he began at once to build on the new foundations. Wherever good work was being done in any part of the Empire he asked leave to help that work, and where no work was being done he took steps to supply new ideas and to provide the means of carrying them out. There is scarcely a university or medical school in the Empire which is not in some way indebted to him, and the part he played in some of the most brilliant studies of the last quarter of a century was of a kind to inspire the whole profession of medicine with respect and affection. Fletcher was friend to every honest seeker after truth and he possessed in special degree the faculty for friendship. His loyalty was unquenchable and he served no ends except those of the good of his fellows. It is no accident that his great influence was exerted during one of the most productive periods in the history of British medicine. He was in large measure the architect of success. Because he gave his whole strength to the conquest of disease and the pursuit of knowledge about health, millions of his fellows to-day are his beneficiaries.—*The Times, London.*

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A CHAMBER FOR EXPERIMENTALLY FREEZING HORTICULTURAL PRODUCTS AT VERY LOW TEMPERATURES

IN the course of experiments in the freezing preservation of fruits and vegetables, different temperatures have been employed to study the effects of different rates of freezing on the subsequent quality of the products. In this work samples of material in individual quantities of one pound or less have been used, and the temperature has been controlled at will from 32 deg. F. to a minimum of −100 deg. F.

In order to obtain temperatures below −10 deg. F. the refrigerating qualities of solid carbon dioxide were employed, using ordinary denatured alcohol as the medium of heat transfer from the container of the product to the solid carbon dioxide.

The methods used and the apparatus devised for this work are somewhat similar to those employed by others in experimental freezing of fruits or fruit pulps but differ in important particulars.[1,2] The present article describes the apparatus in detail together with the procedure in its use which enabled sustained temperatures as low as −100 deg. F. to be maintained. In view of the increasing attention being given to the study of the preservation of fruits and vegetables by freezing this description of the apparatus and its use is given for the benefit of other investigators.

The frame of the freezing chamber is solidly constructed of wood. Its walls are sheathed on the outside with galvanized sheet iron and are sheathed on the inside with thin sheet copper. The out dimensions are: Length, 28 inches; width, 34 inches, and height, 34 inches. Four inches of sheet cork are used for insulation in the sides and six inches of cork in the bottom.

The lid is constructed similar to a cold storage door with four inches of sheet cork insulation and double contact closure. A chain stop is used to hold the lid in an upright position when opened.

The capacity of the copper-lined refrigerating chamber is about seven gallons of liquid, when the chamber is ready for operation.

In order to facilitate heat transfer, the solid carbon dioxide is held in two copper boxes, set away from the side walls and bottom of the refrigerating chamber about one and one half inches and separated from each other in the center by a space of four inches. In this center space a double tier rack is placed upon which to rest the small containers of the product to be frozen. The capacity of the rack is eight No. 2 cans or six of the low type cans developed for frozen fruits and holding about one pound of material.

The two copper boxes are weighted with scrap iron to overcome their buoyance when immersed in the denatured alcohol. These boxes are equipped with copper lids, having wooden knobs so that the tops may be lifted conveniently and without danger of freezing the hands even when very low temperatures prevail in the freezing chamber.

These two boxes for the solid carbon dioxide have the following outside dimensions: Length, 14 inches, width, 5½ inches, and height, 14 inches. They are made of fairly thin sheet copper, and the lids slightly overhang the boxes in order to minimize the drip of alcohol into them as the containers or frozen product or the supporting rack are lifted out.

The two copper chambers were given the specified width in order to accommodate half blocks of solid carbon dioxide as ordinarily manufactured. However, in practise, it has been found that it is sometimes desirable to break up the block into smaller pieces.

[1] W. H. Harrison, Continental Can Company, Chicago, Illinois. Correspondence to the writer, December 29, 1931.

[2] D. G. Sorber, "A New Quick Frozen Fruit Product," *Fruit Products Journal*, 11: 229–230, 249, 255, April, 1932.