writer (3), being the tough fibrous fracture, absence of valeric acid odor and slightly bitter taste as compared with the short, irregular fracture, valeric acid odor and more bitter taste of *V. cassinoides*.

A microscopical description of the stem bark of *Aronia melanocarpa* **var.** *grandifolia* is given for the first time. It is found to differ from the stem bark of *V. cassinoides* (3) in many particulars chief among which are the absence of rosette crystals of calcium oxalate and stone cell groups and the presence of rod-shaped crystals and numerous groups of sclerenchyma fibers.

REFERENCES.

(1) L. H. Bailey, "The Standard Cyclopedia of Horticulture," 1 (1922), 396.

(2) A. Rehder, "Manual of Cultivated Trees and Shrubs," page 384.

(3) H. W. Youngken, "Viburnum Cassinoides, a Recent Substitute for Viburnum Prunifolium," JOUR. A. PH. A., 17 (1928), 330–335.

E. L. Newcomb said that in the last five or ten years that the origin of some of our drugs has not been that which was formerly thought to be the source. He expressed appreciation of Dr. Youngken's investigations.

MASSACHUSETTS COLLEGE OF PHARMACY,
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STABILITY OF ANÆSTHETIC ETHER IN CONTAINERS OF VARIOUS TYPES.*

BY F. VAN DERIPE, L. W. GREEN AND R. E. SCHOETZOW.

It is the practice of European manufacturers to package anæsthetic ether in glass bottles, stoppered, some with glass stoppers, others with cork stoppers and still others with leadfoil-covered cork stoppers. Until about thirty years ago Squibb Ether was packaged in containers of the last named type. Due to slow but definite losses of ether by evaporation, and fire-hazard following possible breakage in shipping, this type of container was discontinued and hermetically sealed tin cans adopted by Dr. Edward R. Squibb.[1] Considerable experimental evidence over a number of years has shown that contact with metallic copper has a marked effect in preventing the decomposition of ether. Accordingly, Squibb Ether is now packaged in hermetically sealed tin cans, the interior of which is copper-plated.

In order to confirm the findings of Nitardy and Tapley[2] in regard to the superior keeping qualities of anæsthetic ether packaged in copper-plated cans over that packaged in tin cans and glass bottles, the following experiment was undertaken.

A batch of Anæsthetic Ether was subdivided into glass-stoppered amber bottles, ordinary tin cans and copper-plated tin cans. About one hundred and seventy containers of each type were put up, each container holding a quarter-pound of ether. These were stored in the dark, at room temperature for a period of fifteen months. Periodically, ten containers of each type were opened and

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* Scientific Section, A. PH. A., Rapid City meeting, 1929.

[1] Dr. Edward R. Squibb, *Ephemeris*, 2 (1884), 621.

[2] F. W. Nitardy and M. W. Tapley, JOUR. A. PH. A., 17 (1928), 966. *Anaesthesia and Analgesia*, 7 (1928), 318. *Brit. J. Anesth.*, 6 (1928), 53.

tested for peroxides[1] and aldehydes.[2] The following table gives the percentages of positive results found at each examination:

	Type of Container. (a) Tin Can.		(b) Copper Plated Tin Can.		(c) Glass-Stoppered Amber Bottle.	
Age in months.	Perox.	Ald.	Perox.	Ald.	Perox.	Ald.
1	90%	30%	0%	0%	0%	20%
2	90	90	0	0	0	0
3	90	60	0	0	30	0
4	100	40	0	0	70	0
5	100	100	0	0	20	0
6	100	100	0	0	90	70
7	100	100	0	0	100	100
8	70	90	0	0	100	90
12	70	90	0	0	100	90
15	40	100	0	0	100	90

The above data demonstrates again the action of copper in preventing the development of both aldehydes and peroxides in ether. It is evident that the copper-plated tin can is markedly superior to the glass bottle or ordinary tin can as a container for anæsthetic ether.

During this work and the daily control of ether, discrepancies have sometimes arisen in the aldehyde test. Investigation of these discrepancies has shown that,

1. The smaller the particles of potassium hydroxide, the more readily is the yellow coloration produced. Fragments about 3 mm. in size are recommended. Powder should be rigidly excluded.

2. A high grade of potassium hydroxide must be employed. Low grade material has been known to produce yellow coloration in contact with ether where higher purity potassium hydroxide did not.

3. Potassium Hydroxide test solution (U. S. P. X) is not nearly as sensitive as the solid potassium hydroxide in the detection of aldehydes. This is in accord with the finding of E. Mallinckrodt, Jr. (*J. A. C. S.*, 49 (1927), 2655).

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ABSTRACT OF DISCUSSION.

James C. Munch inquired whether the author had an explanation for the beneficial action of copper.

The author replied that it probably is due to the greater selectivity of the copper for oxygen.

F. W. Nitardy said that a rather elaborate piece of research work had been under way since the study was begun. The work would be completed within a year, it is hoped, and he would prefer not to go into the subject at this time; a number of interesting developments had come up in the research.

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[1] Peroxides were tested for by the method of the U. S. P. X.

[2] Aldehydes were tested for by placing 30 cc. of ether and 5 Gm. of solid potassium hydroxide in fragments a few millimeters in size, into a glass-stoppered flask, placing this in the dark and agitating it occasionally during five hours. A yellow coloration showed the presence of aldehydes.