

whether recurring or not, the location of the eruption, and whether these eruptions became infected. Boils were brought to a head, cleansed and dressed with ointment. Extract of witch-hazel, resin of pine, leaves of the *Annona squamosa* are a few of the remedies in use. Oils from the seeds of *Persea* and extracts of the fruit, *Spondias mombin*, were a common cure for skin eruptions. Not infrequently the body was painted with vegetable dyes, as with the use of blood red juice of the *Rivina humilis* and the juice of the indigo plant. Of the numerous remedies used by the Aztecs, only a few have been introduced into modern medicine, namely: liquidambar, sarsaparilla (*Smilax medica*), Mexican scammony or orizaba-jalapa root (*Ipomœa orizabensis*), Guaiacum (*Guajacum officinale*), copal (*Elaphrium bipinnatum*), *E. forullense* *Lippia mexicana* and various balsams and gums.

The vast store of Aztec herbal remedies which it has not been possible to touch here should prove a fruitful field for further investigation and experimentation.

CHEMICAL STABILITY OF ANESTHETIC ETHER.*

FORMATION OF ALDEHYDES AND PEROXIDES IN ETHER STORED IN CONTAINERS NOT SEALED OR TIGHTLY CLOSED.

BY J. E. AURELIUS, E. S. HERLONG AND F. W. NITARDY.¹

The chemical stability of anesthetic ether in the sealed containers of commerce and in these same containers after having been opened is a matter of interest and importance. This is attested by the italicized portion of the U. S. P. X monograph on Ether:

"Caution—Ether to be used for anesthesia must be preserved only in small, well-closed containers, and is not to be used for this purpose if the original container has been opened longer than twenty-four hours."

The present report deals only with the changes occurring when the containers are stoppered with corks such as probably would be used if a sealed can were opened and set aside for use at some later time. The results show that, irrespective of the size or type of container, an aldehyde- and peroxide-free ether does not remain unchanged under these conditions: both aldehydes and peroxides develop. In addition to these questions of chemical purity, storage of ether in other than sealed containers raises the very practical considerations of ether evaporation and increased fire hazard.

Chemical stability can be studied only by using tests of the highest possible accuracy and sensitivity; otherwise one will not know whether impurities are or are not present initially, whether such impurities do develop and if so what quantities form. The tests used in the present work are as follows:

Aldehydes.—The fuchsin method as described by Carey, Green and Schoetzow,² further refined by controlling the temperature at 20° C. This test is accurate to 0.5 p. p. m.

Peroxides.—A special cadmium potassium iodide method,³ suitable for quantitative work, and sensitive to 0.1 p. p. m.

* Section on Practical Pharmacy and Dispensing, A. Ph. A., Portland meeting, 1935.

¹ Chemical and Pharmaceutical Laboratories, E. R. Squibb and Sons, Brooklyn, N. Y.

² JOUR. A. PH. A., 22, 1237 (1933).

³ Green and Schoetzow, *Ibid.*, 22, 412 (1933).

For this study anesthetic ether was packaged as follows:

- $\frac{1}{4}$ -lb. cans: 200 of each of 2 types of cans.
- $\frac{1}{2}$ -lb. cans: 100 of each of 2 types of cans.
- 1-lb. cans: 50 of each of 2 types of cans.
- One 50-gallon metal drum.

The 50-gallon drum was closed with the usual screw plug and the cans were stoppered with corks. All the samples were stored during the summer at atmospheric temperatures. From each of the cans and from the drum, portions of ether were removed daily, thus simulating conditions of use. The ether removed from the cans in each series was mixed and this composite was used for the assays; thus one composite was obtained each day representing each of the two series of $\frac{1}{4}$ -lb. cans, etc.

The aldehyde and peroxide tests recorded in the following table show that:

(a) After one day all the ethers excepting that in the small cans of Type A had developed peroxides and after two days none of the ethers was peroxide-free. In all cases except one the peroxide content was higher after two days than after one day. The rate of peroxide development in cans of Type B was practically the same as in the 50-gallon drum. Although the rate was slower in cans of Type A, peroxides did form in these cans as well as in the other containers.

(b) Aldehydes formed in every case. No difference, at least no significant difference, was caused by difference in type of can. Aldehydes developed more slowly than peroxides, but on the third day the amount in the cans had become appreciable. The formation of aldehydes in the drum was greater than in the cans.

TABLE I.

	Aldehydes in P. P. M.				Peroxides in P. P. M.		
	Original Ether.	Days' Storage.			Original Ether.	Days' Storage.	
		1.	2.	3.		1.	2.
$\frac{1}{4}$ -lb. cans							
Type A	0	1	1	2-5	0	0	8
Type B	0	$\frac{1}{2}$	1	5-10	0	20	26
$\frac{1}{2}$ -lb. cans							
Type A	0	1	2	5	0	0	6
Type B	0	2	1	5	0	25	28
1-lb. cans							
Type A	0	2	$\frac{1}{2}$	5	0	14	4
Type B	0	1	1	2-5	0	18	24
50-gal. drum	0	2	2-5	10-20	0	18	27

IS DISPENSING AND PREPARATION OF MEDICINAL SUBSTANCES A LOST ART?*

BY MAX N. LEMBERGER.

Two decades ago the first intimation of a separation between the professional and commercial interests of pharmacy had been discussed freely. It was evident at that time that such an undertaking would be important, necessary and essential to return, and to preserve a professional recognition by the pharmacists of old:

* Section on Practical Pharmacy and Dispensing, A. PH. A., Dallas meeting, 1936.