SUMMARY.

1. Although the value of benzoin as a preservative of lard has seemed well established in the older literature, there has recently been some question on this point.

2. Measuring the deterioration by the liberation of free iodine from potassium iodide, it was found that plain lard deteriorates several times as rapidly as benzoinated lard.

3. In regard to the decolorization of iodine by unsaturated fats, it was found that benzoin reduces the rate of absorption of iodine at the ethylenic linkages.

4. Although 0.5% of hydroquinone has been found to retard the development of rancidity in lard, it is not suitable for use as a stabilizer in ointment of potassium iodide, on account of the color developed, varying from gray to brown.

5. The color of Ointment of Potassium Iodide, N. F. V changes from white to gray after several weeks. The ingredient responsible for this change is the benzoin used as a stabilizer in the lard.

REFERENCES.

(1) William J. Husa and Lydia M. Husa, JOUR. A. PH. A., 15 (1926), 1071–1074.
(2) William J. Husa and Lydia M. Husa, *Ibid.*, 17 (1928), 243–247.
(3) C. Moureu and C. Dufraisse, British patent 181,365, June 7, 1922.
(4) Private communication to author.
(5) George W. Fiero, *Amer. J. Pharm.*, 102 (1930), 149
(6) Deschamps, *J. pharm. chim.* (3), 4 (1843), 201–210.
(7) A. Tschirch and A. Barben, *Schweiz. Apoth. Ztg.*, 62 (1924), 281–285, 293–295; through *Chem. Abstr.*, 18 (1924). 2970.

COLLEGE OF PHARMACY,
UNIVERSITY OF FLORIDA,
GAINESVILLE, FLA.

THE EFFECT OF HEAT ON ACACIA.*

BY L. F. GABEL.

In a previous paper the effect of heat on tragacanth was described (JOUR. A. PH. A., 17 (1928), 1206). The work covered in this paper was prompted by the results obtained with tragacanth upon application of heat.

The first step in this investigation was concerned with the effect of heat on powdered acacia. In all the experiments the U. S. P. formula for Mucilage of Acacia was used. Thirty-five-gram samples of powdered acacia (best grade) were taken from three different commercial lots, transferred to porcelain dishes and then subjected to heat at 100° C. for two days. The dishes were removed from the source of heat and allowed to cool to room temperature. Sufficient water was then added to produce 100 cc. of mucilage.

Control samples of Mucilage of Acacia were also prepared from the three lots of acacia in order to establish a possible difference between heated and normal acacia.

A specially standardized pipette was found best adapted for determining the relative viscosities of the experiments. A 50-cc. pipette was calibrated for

* Scientific Section, A. PH. A., Baltimore meeting, 1930. No discussion.

the purpose by noting the number of seconds required for water to flow from the upper to a lower mark placed about three inches above the tip of the pipette.

The three mucilages prepared from the normal acacia required 240, 253 and 227 seconds to flow from the upper to lower mark on the pipette, while water required twenty seconds. Mucilages made with heated acacia required 741, 655 and 794 seconds, respectively. Assuming water as 1.0 and reducing the above results for comparative values by dividing by twenty, then the values for normal mucilages of acacia were 12.0, 12.6 and 11.3. Mucilages prepared with heated acacia were 37, 39.7 and 32.7.

The marked increase in viscosity of the mucilage made from heated acacia instigated experiments to determine what effect varying degrees of heat with varying time periods had on powdered acacia. Thirty-five-gram samples of powdered acacia were heated at 40° and 75° C., respectively, for two days; other experiments were heated at 100° C. for four, eight, sixteen, twenty-four, forty-eight and seventy-two hours, respectively. Mucilages were then prepared from the above heated acacia by adding sufficient water to make 100 cc.

The following results were obtained by using the previously described flow test at room temperature:

VISCOSITY OF MUCILAGE OF ACACIA.

DEGREE AND LENGTH OF TIME OF HEATING POWDERED ACACIA.

	Sample No.	*Control* made without.	40° C. for 2 days.	75° C. for 2 days.	100° C. for 4 hrs.	100° C. for 8 hrs.	100° C. for 16 hrs.	100° C. for 24 hrs.	100° C. for 48 hrs.	100° C. for 72 hrs.
No. of seconds required to flow from upper to lower mark of pipette	1	240	300	445	312	374	494	587	741	1480
	2	253	275	450	292	366	509	523	794	1170
	3	227	293	325	274	302	603	489	655	1065
Average		240	289	407	293	347	535	533	730	1228
Comparison with water (÷ 20)		12	14.5	20.3	14.5	17.3	26.7	26.7	36.5	61.4

The above table indicates the exceptional increase in viscosity of Mucilage of Acacia upon prolonged heating of the acacia. Maximum viscosity was obtained by heating at 100° for three days.

It was desirous to know what effect continued heat had upon normal U. S. P. Mucilage of Acacia. Samples of the mucilage were placed in Erlenmeyer flasks provided with stoppers in which glass tubes projected for reflux purposes. These experiments were placed on the steam-bath and heated for 4, 8, 16 and 24 hours, respectively, and then allowed to cool. These experiments did not materially change the viscosity of the mucilage and were comparable to the unheated normal mucilage.

PHYSICAL AND CHEMICAL VARIATIONS IN HEATED POWDERED ACACIA.

Samples taken from three different lots of acacia were dried over sulphuric acid in vacuo for six weeks. These samples lost on an average 6.8%, representing the actual moisture present.

Acacia heated at 100° C. for twenty-four hours lost 9.2% of its weight. This amount is 2.4% in excess of the moisture content and probably is due to a chemical change taking place at 100° C. The oxidizing ferment in acacia is eliminated by heat of 100° C.

The "United States Dispensatory" states that upon "prolonged heating of the dried gum, arabic acid is changed to metarabic acid. Sulphuric acid will also change arabic to metarabic acid."

Thirty-five-gram samples of powdered acacia were treated with 7 cc. sulphuric acid, 70 cc. alcohol and 14 cc. water and allowed to stand one day. The residue was washed with alcohol and water and filtered on a suction filter. The precipitate was dried and then water was added to it. Thirty-five grams of the above treated acacia dissolved in water to 200 cc. (two times the U. S. P. formula) produces a thick opaque mucilage resembling that of starch paste.

Since prolonged heating of acacia produces metarabic acid with the resulting thick mucilage of acacia, and the direct chemical change of arabic acid to metarabic acid with sulphuric acid with the production of a thick mucilage from the acid treated acacia, it is possible that the increased viscosity of the mucilage made from heated acacia is caused by the formation of metarabic acid.

SUMMARY.

1. Heat applied to powdered acacia increases the viscosity of the mucilage. Prolonged heating at 100° C. produces maximum viscosity.

2. Heat applied to the mucilage of acacia does not thicken the mucilage.

3. Volatile matter other than moisture is lost at 100° C. This indicates a chemical change.

4. Metarabic acid is formed upon heating powdered acacia.

5. Upon preparing a mucilage from acid treated powdered acacia a very thick mucilage is obtained.

6. Statements No. 4 and No. 5 may indicate that the thick mucilage obtained with heated powdered acacia is due to the change of arabic to metarabic acid.

ANALYTICAL DEPARTMENT,
PARKE, DAVIS & COMPANY,
DETROIT, MICHIGAN.

THE MARKET QUALITY OF PHARMACEUTICAL RAW MATERIALS.*

BY GEORGE E. ÉWE.

It has been aptly said that adulteration of raw materials offered to the pharmaceutical industry is a "dead issue," and this does appear to be mainly true in so far as wilful adulteration is concerned. Yet much remains to be done to eliminate minor defects in supplies of raw materials and to assure uniformity in successive supplies of certain of these materials.

The raw materials examined in the Laboratories of the Tailby-Nason Company, Boston, Mass., during the past several years presented a goodly proportion of defects, aside from divergences from standard due to natural variation in proximate constituents; approximately 1.5% of the items being deficient in some way.

While this proportion of defects may seem excessive to the uninitiated the actual conditions are far more encouraging, since most of the defects noted were

* Scientific Section, A. PH. A., Baltimore meeting, 1930.