EXAMINATION OF CHINESE WOOD OIL

By MAXIMILIAN TOCH

The paper that follows continues an article begun in January *Journal of Oil & Fat Industries* on China Wood Oil by Maximilian Toch. It appeared recently in the third and latest edition of Chemistry & Technology of Paints, by the author, and is considered the most up-to-date and authoritative work on this subject to date. Its importance is such that we have secured permission from Mr. Toch and from the publishers, D. Van Nostrand Co., New York, to reprint this chapter. The third and concluding installment will appear in March—*THE EDITOR.*

Two samples of Chinese wood oil were used (one from J.M.C and the other from M.A.F. Co.). Each of these was adulterated with 5 per cent, 10 per cent, and 15 per cent by weight of the following oils: paraffin oil, soya bean oil, linseed oil, perilla oil, corn oil, menhaden oil, stillingia oil, peanut oil, tea seed oil, tallow seed oil, cotton seed oil and rape seed oil.

The specific gravities of the oils were determined by the use of a Westphal balance at 60° F.

A Zeiss Abbé's refractometer was employed for the measurement of the refractive indices, while the dispersion values were calculated from the refractive indices and the readings indicated on the drum of the compensative prisms with the aid of the dispersion table provided for the refractometer. The temperature throughout the experiment was maintained at 21.5° C.

The following table shows the results obtained for all the original oils used in the adulteration of the two samples of Chinese wood oil:

Oil	Sp. Gr. 60° F.	Ref. Ind. 21.5° C.	Dispersion 21.5° C.
Chinese wood oil J.M.C.	0.938	1.5181	0.02073
Chinese wood oil M.A.F. Co.	0.939	1.5183	0.02074
Light paraffin oil	0.874	1.4870	0.01158
Soya bean oil	0.944	1.4769	0.01027
Refined linseed oil	0.933	1.4796	0.01078
Corn oil	0.940	1.4753	0.01008
Perilla oil	0.934	1.4821	0.01062
Stillingia oil	0.936	1.4822	0.01114
Peanut oil	0.933	1.4713	0.00971
Menhaden oil	0.939	1.4816	0.01036
Tea seed oil	0.913	1.4695	0.00927
Tallow seed oil	0.949	1.4860	0.01092
Cotton seed oil	0.922	1.4720	0.009897
Rape seed oil	0.914	1.4734	0.009894

The following table shows the effect of adulteration on the physical contents of Chinese wood oil:

SAMPLE I. J.M.C. CHINESE WOOD OIL

Oil	Sp. Gr. 60° F.	Ref. Ind. 21.5° C.	Dispersion 21.5° C.
Chinese wood oil alone	0.938	1.5181	0.02073
C. W. O. plus 5% paraffin oil	0.934	1.5165	0.02019
C. W. O. " 10% " "	0.932	1.5149	0.01964
C. W. O. " 15% " "	0.928	1.5132	0.01933
C. W. O. " 5% soya bean oil	0.938	1.5160	0.02007
C. W. O. " 10% " " "	0.938	1.5139	0.01951
C. W. O. " 15% " " "	0.9385	1.5119	0.01920

	Oil	Sp. Gr. 60° F.	Ref. Ind. 21.5° C.	Dispersion 21.5° C.
C. W. O. plus	5% linseed oil	0.9375	1.5162	0.02007
C. W. O. "	10% " "	0.937	1.5143	0.01976
C. W. O. "	15% " "	0.935	1.5122	0.01921
C. W. O. "	5% perilla oil	0.937	1,5163	0.02020
C. W. O. "	10% " "	0.936	1.5145	0.01976
C. W. O. "	15% " "	0.935	1.5125	0.01932
C. W. O. "	5% corn oil	0.938	1.5159	0.02007
C. W. O. "	10% " "	0.938	1.5140	0.01977
C. W. O. "	15% " "	0.938	1.5118	0.01907
C. W. O. "	5% menhaden oil	0.938	1.5162	0.02033
C. W. O. "	10% " "	0.938	1.5138	0.01977
C. W. O. "	15% " "	0.938	1.5115	0.01903
C. W. O. "	5% stillingia oil	0.938	1.5163	0.02020
C. W. O. "	10% " "	0.937	1.5146	0.01990
C. W. O. "	15% " "	0.937	1.5127	0.01948
C. W. O. "	5% peanut oil	0.938	1.5158	0.02007
C. W. O. "	10% " "	0.938	1.5136	0.01983
C. W. O. "	15% " "	0.937	1.5114	0.01906

The effect of adulteration on the physical constants of J.M.C. China wood oil is shown in the following table:

C. W. O. plus	5% tea seed oil	0.938	1.5156	0.02006
C. W. O. "	10% " " "	0.936	1.5135	0.01970
C. W. O. "	15% " " "	0.935	1.5110	0.01879
C. W. O. "	5% tallow seed oil (Hankow)	0.941	1.5167	0.02013
C. W. O. "	10% tallow seed oil (Hankow)	0.943	1.5154	0.01978
C. W. O. "	15% tallow seed oil (Hankow)	0.945	1.5135	0.01949
C. W. O. "	5% cotton seed oil	0.939	1,5161	0.02005
C. W. O. "	10% " " "	0.938	1.5138	0.01962
C. W. O. "	15% " " "	0.937	1.5114	0.01916
C. W. O. "	5% rape seed oil	0.938	1.5161	0.02026
C. W. O. "	10% " " "	0.936	1.5139	0.01982
C. W. O. "	15% " " "	0.935	1.5116	0.01925
C. W. O. "	5% soya bean oil (S2)	0.938	1.5162	0.02005
C. W. O. "	10% " " " "	0.938	1.5140	0.01979
C. W. O. "	15% " " " "	0.937	1.5117	0.01940
C. W. O. "	5% menhaden oil (S2)	0.938	1.5166	0.02029
C. W. O. "	10% " " "	0.938	1.5147	0.01978
C. W. O. "	15% " " "	0.938	1.5136	0.01922

SAMPLE II. M.A.F. Co. CHINESE WOOD OIL

Chinese wood oil alone		0.939	1.5183	0.02074
C. W. O. plus	5% paraffin oil	0.935	1.5168	0.02046
C. W. O. "	10% " "	0.932	1.5148	0.02000
C. W. O. "	15% " "	0.928	1.5133	0.01967
C. W. O. "	5% soya bean oil	0.939	1.5161	0.02030
C. W. O. "	10% " " "	0.939	1.5140	0.01990
C. W. O. "	15% " " "	0.940	1.5122	0.01954
C. W. O. "	5% linseed oil	0.939	1.5162	0.02032
C. W. O. "	10% " "	0.937	1.5141	0.02004
C. W. O. "	15% " "	0.936	1.5124	0.01950
C. W. O. "	5% perilla oil	0.938	1.5166	0.02044
C. W. O. "	10% " "	0.938	1.5148	0.02004
C. W. O. "	15% " "	0.937	1.5130	0.01962

Oil				Sp. Gr. 60° F.	Ref. Ind. 21.5° C.	Dispersion 21.5° C.
C. W. O.	plus	5%	corn oil	0.939	1.5161	0.02032
C. W. O.	"	10%	" "	0.939	1.5138	0.01963
C. W. O.	"	15%	" "	0.939	1.5119	0.01903
C. W. O.	"	5%	menhaden oil	0.939	1.5166	0.02032
C. W. O.	"	10%	" "	0.939	1.5147	0.01990
C. W. O.	"	15%	" "	0.939	1.5130	0.01955
C. W. O.	"	5%	stillingia oil	0.938	1.5166	0.02032
C. W. O.	"	10%	" "	0.938	1.5148	0.01990
C. W. O.	"	15%	" "	0.937	1.5130	0.01955
C. W. O.	"	5%	peanut oil	0.939	1.5160	0.02019
C. W. O.	"	10%	" "	0.939	1.5138	0.01990
C. W. O.	"	15%	" "	0.938	1.5112	0.01920

The following table shows the effect of adulteration on the physical constants of M.A.F. Co. China wood oil:

C. W. O.	plus	5%	tea seed oil	0.937	1.5160	0.02011
C. W. O.	"	10%	" " "	0.936	1.5138	0.01975
C. W. O.	"	15%	" " "	0.935	1.5112	0.01899
C. W. O.	"	5%	tallow seed oil (Hankow)	0.940	1.5169	0.02012
C. W. O.	"	10%	tallow seed oil (Hankow)	0.942	1.5156	0.01970
C. W. O.	"	15%	tallow seed oil (Hankow)	0.944	1.5140	0.01945
C. W. O.	"	5%	cotton seed oil	0.938	1.5162	0.02026
C. W. O.	"	10%	" " "	0.937	1.5140	0.01990
C. W. O.	"	15%	" " "	0.936	1.5119	0.01934
C. W. O.	"	5%	rape seed oil	0.939	1.5164	0.02015
C. W. O.	"	10%	" " "	0.937	1.5140	0.01990
C. W. O.	"	15%	" " "	0.935	1.5121	0.01926
C. W. O.	"	5%	soya bean oil (S2)	0.939	1.5166	0.02028
C. W. O.	"	10%	" " " "	0.938	1.5144	0.01990
C. W. O.	"	15%	" " " "	0.938	1.5123	0.01921
C. W. O.	"	5%	menhaden oil (S2)	0.939	1.5168	0.02033
C. W. O.	"	10%	" " "	0.939	1.5152	0.01984
C. W. O.	"	15%	" " "	0.938	1.5132	0.01921

Heat Test of Chinese Wood Oil

Apparatus.—Test tubes, 15 cm. by 16 mm., closed by a cork so perforated that a glass rod could move freely.

A 400-c.c. glass beaker, 10.5 cm. by 7.3 cm., filled with soya bean oil to a height of 7.5 cm.

A nitrogen-filled thermometer of 600° F., placed at 1.5 cm. from the bottom of the bath.

Procedure.—The bath was heated to 560° F. Then the test tube containing 5 c.c. of the oil to be tested was immersed so that the bottom of the tube was level with the lowest part of the bulb of the thermometer. The time was noted. The source of heat was so adjusted that the temperature of the bath was kept as steady as possible at 540° F. When the sample had been in the bath 9 minutes, the glass rod was raised at intervals of ¼ minute until the sample became gelatinized. The time was again recorded. The results obtained are shown in the following:

TABLE I. J.M.C. CHINESE WOOD OIL

Oil	Time in Minutes Run 1	Run 2	Average
Chinese wood oil alone	11:30	11:20	11:25
C. W. O. plus 5% paraffin oil	12:30	12:16	12:23
C. W. O. " 10% " "	13:50	13:30	13:40
C. W. O. " 15% " "	15:20	15:00	15:10
C. W. O. " 5% soya bean oil	12:35	12:30	12:33
C. W. O. " 10% " " "	13.20	13:10	13:15
C. W. O. " 15% " " "	14:50	14:30	14:40
C. W. O. " 5% linseed oil	12:50	12:45	12:48
C. W. O. " 10% " "	14:30	14:20	14:25
C. W. O. " 15% " "	16:00	15:40	15:50
C. W. O. " 5% perilla oil	12:30	12:50	12:40
C. W. O. " 10% " "	13:45	13:30	13:38
C. W. O. " 15% " "	15:10	15:30	15:20
C. W. O. " 5% corn oil	13:20	13:40	13:30
C. W. O. " 10% " "	14:15	14:35	14:25
C. W. O. " 15% " "	16:20	16:10	16:15
C. W. O. " 5% menhaden oil	13:15	13:20	13:18
C. W. O. " 10% " "	13:50	14:10	14:00
C. W. O. " 15% " "	14:40	14:50	14:45
C. W. O. " 5% stillingia oil	12:20	12:30	12:25
C. W. O. " 10% " "	12:40	13:00	12:50
C. W. O. " 15% " "	13:30	13:40	13:35
C. W. O. " 5% peanut oil	12:00	11:50	11:55
C. W. O. " 10% " "	13:30	13:20	13:25
C. W. O. " 15% " "	14:45	14:50	14:48

HEAT TEST OF CHINESE WOOD OIL

Chinese wood oil alone	10:10	10:20	10:15
C. W. O. plus 5% tea seed oil	11:40	11:50	11:45
C. W. O. " 10% " " "	12:20	12:10	12:15
C. W. O. " 15% " " "	14.10	14:20	14:15
C. W. O. " 5% tallow seed oil	11:10	11:20	11:15
C. W. O. " 10% " " "	11:30	11:40	11:35
C. W. O. " 15% " " "	12:00	12:5	12:3
C. W. O. " 5% cotton seed oil	10:55	11:5	11:00
C. W. O. " 10% " " "	12:00	12:10	12:5
C. W. O. " 15% " " "	13:5	13:15	13:10
C. W. O. " 5% rape seed oil	11:00	11:00	11:00
C. W. O. " 10% " " "	12:10	12:20	12:15
C. W. O. " 15% " " "	14:00	13:50	13:55
C. W. O. " 5% soya bean oil (S2)	11:10	10:55	11:3
C. W. O. " 10% " " " "	12:15	12:15	12:15
C. W. O. " 15% " " " " "	13:50	13:40	13:45
C. W. O. " 5% menhaden oil (S2)	10:55	11:5	11:00
C. W. O. " 10% " " "	11:50	11:40	11:45
C. W. O. " 15% " " "	12:40	12:50	12:45

TABLE II. M.A.F. CO. CHINESE WOOD OIL

Chinese wood oil alone	10:30	10:40	10:35
C. W. O. plus 5% paraffin oil	12:40	12:20	12:30
C. W. O. " 10% " "	14:30	14:15	14:23
C. W. O. " 15% " "	15:20	15:20	15:20
C. W. O. " 5% soya bean oil	11:20	11:10	11:15
C. W. O. " 10% " " "	12:15	12:00	12:18
C. W. O. " 15% " " "	12:40	12:50	12:45

Oil	Time in Minutes Run 1	Run 2	Average
C. W. O. plus 5% linseed oil	11:10	11:25	11:18
C. W. O. " 10% " "	12:30	12:10	12:20
C. W. O. " 15% " "	13:50	13:40	13:45
C. W. O. " 5% perilla oil	11:20	11:34	11:27
C. W. O. " 10% " "	12:20	12:15	12:8
C. W. O. " 15% " "	13:15	13:20	13:18
C. W. O. " 5% corn oil	11:20	11:40	11:30
C. W. O. " 10% " "	12:10	12:30	12:20
C. W. O. " 15% " "	13:20	13:10	13:15
C. W. O. " 5% menhaden oil	11:50	11:45	11:47
C. W. O. " 10% " "	12:20	12:30	12:25
C. W. O. " 15% " "	13:30	13:10	13:20
C. W. O. " 5% stillingia oil	11:15	11:5	11:10
C. W. O. " 10% " "	13:00	13:10	13:5
C. W. O. " 15% " "	12:20	12:30	12:25
C. W. O. " 5% peanut oil	12:00	12:5	12:3
C. W. O. " 10% " "	13:00	13:10	13.5
C. W. O. " 15% " "	14:10	14:30	14:20

TABLE II. M.A.F. Co. CHINESE WOOD OIL

Chinese wood oil alone	9:50	10:00	9:55
C. W. O. plus 5% tea seed oil	11:30	11:20	11:25
C. W. O. " 10% " " "	11:50	12:00	11:55
C. W. O. " 15% " " "	13:30	13:50	13:40
C. W. O. " 5% tallow seed oil	11:10	11:5	11:8
C. W. O. " 10% " " "	11:20	11:25	11:23
C. W. O. " 15% " " "	11:35	11:45	11:40
C. W. O. " 5% cotton seed oil	10:15	10:25	10:20
C. W. O. " 10% " " "	11:15	11:20	11:18
C. W. O. " 15% " " "	13:10	13:15	13:13
C. W. O. " 5% rape seed oil	10:35	10:45	10:40
C. W. O. " 10% " " "	11:55	12:5	12:00
C. W. O. " 15% " " "	13:30	13:35	13:33
C. W. O. " 5% soya bean oil (S2)	10:40	10:50	10:45
C. W. O. " 10% " " " "	11:55	12:00	11:58
C. W. O. " 15% " " " "	13:20	13:30	13:25
C. W. O. " 5% menhaden oil (S2)	10:45	10:35	10:40
C. W. O. " 10% " " "	11:30	11:40	11:35
C. W. O. " 15% " " "	12:30	12:35	12:33

HEAT AND QUALITY TEST OF CHINESE WOOD OIL

By R. S. Worstall's Method

One hundred grams of the oil was placed in a porcelain casserole, having a capacity of two hundred and ten cubic centimeters and an average diameter of three inches. This was set on a wide-flanged tripod which had an opening approximately the size of the casserole. The oil was at first heated rapidly with a full Bunsen flame and stirred with a thermometer of one-inch immersion. When the temperature reached 540° F., the flame was turned down and the temperature maintained as near 540° F. as possible, until on lifting the thermometer the oil dropped with a pronounced string. The time required after reaching 540° F. until stringing, was recorded as the time of the heat test. For pure tung oil the time limit is approximately eight minutes.

As soon as the oil dropped with a pronounced string, the flame

was removed and the oil stirred with a stiff spatula until it became solid. After one minute the jelly was turned out and cut with a dry, clean spatula for the quality test. Pure tung oil should give a dry non-sticky jelly which can be cut like bread and crumbled under the applied pressure of the spatula.

The following data are results obtained from experiments performed according to the above procedure:—

TABLE I. J.M.C. CHINA WOOD OIL

Oil	Time of Heat Test in Minutes	Quality
J. M. C. China wood oil alone	7:30	Dry, non-adherent, cut well and crumbled well.
C. W. O. plus 5% paraffin oil	8:40	Dry, non-adherent, cut well and crumbled well.
C. W. O. " 10% " "	9:35	Slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 15% " "	10:30	Soft and sticky, cut poorly and non-crummable.
C. W. O. " 5% soya bean oil	8:50	Dry, non-adherent, cut well and crumbled well.
C. W. O. " 10% " " "	9:40	Slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 15% " " "	10:40	Soft and sticky, non-crummable, cut poorly.
C. W. O. " 5% Linseed oil	9:15	Slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 10% " "	10:00	Soft and sticky, cut and crumbled poorly.
C. W. O. " 15% " "	11:30	Soft and sticky, non-crummable, cut poorly.
C. W. O. " 5% perilla oil	9:00	Slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 10% " "	9:35	Slightly soft and sticky, cut and crumbled poorly.
C. W. O. " 15% " "	10:35	Soft and sticky, non-crummable cut poorly.
C. W. O. " 5% corn oil	8:50	Slightly sticky, cut and crumbled fairly well.
C. W. O. " 10% " "	10:10	Sticky, cut and crumbled poorly.
C. W. O. " 15% " "	11:20	Soft, sticky, cut poorly, non-crummable.
C. W. O. " 5% menhaden oil	8:55	Dry, non-sticky, cut and crumbled fairly well.
C. W. O. " 10% paraffin oil	9:25	Same as 5% menhaden oil.
C. W. O. " 15% " "	10:10	Soft, sticky and non-crummable.
C. W. O. " 5% stillingia oil	8:35	Dry, non-sticky cut and crumbled well.
C. W. O. " 10% " "	9:10	Slightly sticky, cut and crumbled fairly well.
C. W. O. " 15% " "	10:45	Soft, sticky, cut and crumbled poorly.
C. W. O. " 5% peanut oil	9:00	Slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 10% " "	9:20	Soft and sticky, cut poorly, non-crummable.
C. W. O. " 15% " "	10:13	Very soft and sticky, cut poorly and non-crummable.

Oil	Time of Heat Test in Minutes	Quality
C. W. O. plus 5% tea seed oil	9:25	Slightly sticky, cut and crumbled fairly well.
C. W. O. " 10% " " "	10:48	Same as 5% tea seed oil.
C. W. O. " 15% " " "	12:8	Very soft and sticky, cut poorly and non-crummable.
C. W. O. " 5% tallow seed oil	8:32	Dry, non-sticky, cut and crumbled fairly well.
C. W. O. " 10% " " "	8:35	Slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 15% " " "	9:25	Soft and sticky, cut poorly and crumbled poorly.
C. W. O. " 5% cotton seed oil	9:10	Slightly soft and sticky, cut and crumbled poorly.
C. W. O. " 10% " " "	10:45	Same as 5% cotton seed oil.
C. W. O. " 15% " " "	12:5	Very soft and sticky, non-crummable, cut poorly.
C. W. O. " 5% rape seed oil	9:30	Slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 10% " " "	10:50	Soft, sticky, cut and crumbled poorly.
C. W. O. " 15% " " "	12:30	Very soft and sticky, cut poorly, non-crummable.
C. W. O. " 5% soya bean oil (S2)[1]	9:23	Slightly sticky and soft cut and crumbled fairly well.
C. W. O. " 10% soya bean oil (S2)	10:45	Same as 5% soya bean oil.
C. W. O. " 15% " " " "	12:10	Soft and sticky, cut and crumbled poorly.
C. W. O. " 5% menhaden oil (S2)	9:13	Slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 10% " " "	10:10	Same as 5% menhaden oil.
C. W. O. " 15% " " "	11:17	Soft and sticky, cut fairly well, non-crummable.

TABLE II. M.A.F.. CO. CHINA WOOD OIL

M. A. F. China wood oil alone	7:10	Dry, non-adherent, cut well and crumbled well.
C. W. O. plus 5% paraffin oil	9:8	Very slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 10% " "	9:55	Same as 5% paraffin oil.
C. W. O. " 15% " "	10:45	Soft and sticky, cut poorly and non-crummable.
C. W. O. " 5% soya bean oil	9:5	Dry, non-adherent, cut and crumbled well.
C. W. O. " 10% " " "	9:45	Slightly sticky and soft, cut and crumbled fairly well.
C. W. O. " 15% " " "	10:50	Soft and sticky, cut poorly, and non-crummable.
C. W. O. " 5% linseed oil	9:00	Very slightly soft and sticky, cut and crumbled well.
C. W. O. " 10% " "	10:10	Slightly soft and sticky cut and crumbled fairly well.
C. W. O. " 15% " "	10:50	Soft and sticky, cut and crumbled poorly.
C. W. O. " 5% perilla oil	9:20	Slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 10% " "	10:22	Sticky and soft, cut poorly and non-crummable.
C. W. O. " 15% " "	11:00	Same as 10% perilla oil.

[1] (S2) 2nd sample.

Oil	Time of Heat Test in Minutes	Quality
C. W. O. plus 5% corn oil	9:00	Slightly sticky, cut fairly well, non-crummable.
C. W. O. " 10% " "	10:00	Soft and sticky, cut poorly, non-crummable.
C. W. O. " 15% " "	11:00	More soft and sticky than 10% corn oil, cut poorly and non-crummable.
C. W. O. " 5% menhaden oil	8:00	Dry, non-sticky, cut and crumbled well.
C. W. O. " 10% " "	9:10	Slightly sticky and soft and crumbled fairly well.
C. W. O. " 15% " "	10:45	Soft and sticky, cut poorly, non-crummable.
C. W. O. " 5% stillingia oil	9:5	Slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 10% " "	10:00	Same as 5% stillingia oil.
C. W. O. " 15% " "	11:8	Soft and sticky, cut poorly, non-crummable.
C. W. O. " 5% peanut oil	8:32	Dry, non-adherent, cut and crumbled well.
C. W. O. " 10% " "	9:15	Very slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 15% " "	10:10	Soft and sticky, cut poorly and non-crummable.
C. W. O. " 5% tea seed oil	9:10	Slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 10% " " "	10:15	Soft and sticky, cut and crumbled poorly.
C. W. O. " 15% " " "	11:45	Same as 10% tea seed oil.
C. W. O. " 5% tallow seed oil	8:20	Dry, non-adherent, cut and crumbled well.
C. W. O. " 10% " " "	8:55	Slightly soft and sticky. cut and crumbled fairly well.
C. W. O. " 15% " " "	9:34	Soft and sticky, cut poorly and non-crummable.
C. W. O. " 5% cotton seed oil	9:15	Very slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 10% " " "	10:45	Same as 5% cotton seed oil.
C. W. O. " 15% " " "	11:48	Soft and sticky, cut poorly, non-crummable.
C. W. O. " 5% rape seed oil	9:5	Slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 10% " " "	10:35	Slightly soft and sticky, cut and crumbled poorly.
C. W. O. " 15% " " "	12:35	Soft and sticky, cut poorly and non-crummable.
C. W. O. " 5% soya bean oil (S2)[1]	9:32	Dry and non-adherent, cut and crumbled well.
C. W. O. " 10% soya bean oil (S2)	10:51	Very slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 15% " " " "	12:15	Soft and sticky, cut poorly and non-crummable.
C. W. O. " 5% menhaden oil (S2)	8:00	Slightly soft and sticky, cut and crumbled fairly well.
C. W. O. " 10% " " "	9:00	Same as 5% menhaden oil.
C. W. O. " 15% " " "	10:10	Soft and sticky, cut and crumbled poorly.

[1] (S2) 2nd sample.

DAVID SCHWARTZ

In the passing of David Schwartz, the American Oil Chemists' Society has lost one of its staunchest members. He has been with us since the founding of the Society of Cotton Products Analysts.

David Schwartz was born in Boston, Mass., fifty years ago and was graduated from the Massachusetts Institute of Technology in the Class of 1897. His Institute record was that of a hard-working, earnest student. It secured him a position very shortly after his graduation with the Southern Cotton Oil Company, where he started as assistant to George F. Dennille, then Head Chemist. He took a tremendous interest in his work and in course of time, when the Company needed a chemist at New Orleans, he was placed in charge of that refinery under A. P. Sauer, who at that time was operating the plants of the Company at New Orleans and Houston. While working at the New Orleans plant as refiner and chief chemist, he met and married Miss Laura Koebel of New Orleans.

Mr. Schwartz remained in charge of the refineries at New Orleans, Houston, and Memphis, until 1917, when he was made General Superintendent of Refineries of the Southern Cotton Oil Company, which position he held until the reorganization of the Company in 1924. Since that date he has been Vice President and General Manager for the South Texas Cotton Oil Company at Houston, Texas, which position he was filling at the date of his death, February 3.

TOCH BROTHERS MERGE WITH STANDARD VARNISH

On January 27, Toch Brothers, Inc., and the Standard Varnish Works, Inc., announced an amalgamation of their interests. In this way, two old and strong paint and varnish houses combine their resources.

Dr. Maximilian Toch, who is one of the world's leading paint and varnish chemists, will give his entire time and attention to the manufacture of Standard and Toch products and the development of new lines. Henry M. Toch becomes Chairman of the Board of Standard Varnish Works, which will otherwise be actively managed by J. W. Robson, President; James S. Wolf, Treasurer; A. D. Robson, Vice-President, in charge of operations; W. C. Appleton, Secretary; J. H. Wood, of Chicago, Vice-President in charge of the Western Division, and A. E. Campbell-Harris, of London, Vice-President, in charge of the European Division. On March 1st the offices of the two companies will be combined at 443 Fourth Avenue. The sales organization of the two companies will continue to function separately.