TABLE IX

Estimated Costs of Quality Deterioration of Stored Linseed Oil [a]

General location of storage	Quantity of total oil stored	Oil not meeting specifications				Estimated loss in price per pound from storage deterioration [b]	
		Quantity	Estimated price per pound	Estimated value	Estimated loss from deterioration	Based on oil not meeting specification	Based on total oil
	Pounds	*Pounds*	*Cents*	*Dollars*	*Dollars*	*Cents*	*Cents*
Northern	42,220,625	.....	.....	.....	.....	.....	.....
Western	77,274,551	223,720	13.355	29,878	1,443	0.645	0.002
Eastern	311,671,973	52,755,542	13.250	6,989,856	395,920	.750	.127
Southern	57,992,402	57,992,402	13.412	7,777,790	341,146	.588	.588
Total	489,159,551	110,971,664	13.335	14,797,524	738,509	.665	.151

[a] Oil stored four to five years at four general locations, mostly from 1948 flaxseed crop.
[b] Oil meeting specifications was priced at 14¢ per pound.

of the United States met specifications, and negligible quantities stored in the California port areas did not meet specifications. About 83% of the 311 million pounds stored at or near the port of New York met specifications; however all of the 58 million pounds stored in the southern area of the country failed to meet specifications.

About 97% of the 118 million pounds of fresh oil (up to a period of one year in storage) met specifications on the basis of samples drawn from individual tank cars. (Industry estimates that from 97 to 100% of the oil prdouced in 1957 met all specifications at the time of sale.)

The causes for failure of the oil to meet specifications were quite different after long periods of storage compared to fresh oil. The fresh oil did not meet specifications mostly because of excessive heated and chilled foots and cloudy appearance. (According to industry opinions, this is typical in freshly-produced oil.) The causes for the stored oil not meeting specifications were mostly attributable to high acid number and high unsaponifiable matter; high heated and chilled foots and cloudy appearance were of secondary importance.

Variations in the several characteristics under specifications for some 393 samples of fresh oil, calculated to a common average for each, showed wide variations in the heated and chilled foots tests as compared to some of the other characteristics.

There were 73 lots of oil (taken from three whole tanks, 39 bottoms, and 31 balances) comprising the almost 112 million pounds not meeting specifications. Thirty-five lots failed to meet specifications due to only one characteristic beyond tolerance whereas 33 lots were "non-spec" because of from two to five characteristics beyond tolerances. Two lots were "non-spec" because all characteristics except color were beyond tolerance. All lots of stored oil (and fresh oil) met specifications for color.

At the same location (eastern and southern areas) the oil held in larger tanks (filled to capacity) showed less deterioration of quality after storage than when held in the smaller tanks.

Similar quantities of oil stored in the warmer areas showed greater deterioration than in cooler locations (eastern and southern areas).

In general, oil in the bottoms of tanks after storage showed greater deterioration than in the balance, but in some cases mixing of the oil (by calculation) could increase the market value of all the oil because of the small quantity of oil in the bottoms as compared to that in the balance. There were also far greater variations of the characteristics in the oil in the bottoms of tanks than in the balance. There are however significant relationships for several of the characteristics between the balance and bottoms oil. It is indicated that different methods could be employed other than sampling and testing the bottoms oil in order to obtain more accurate characteristics of the bottoms. Average characteristics of the balance oil can be obtained, by calculation, from testing the individual samples taken of the balance instead of compositing these samples for testing. The relationships between balance and bottoms oil for several of the characteristics shown in the report could be used to get characteristics of the bottoms instead of sampling and testing the bottoms.

The variations of either of the characteristics of foots are far greater in stored than in fresh oil, such that the use of these tests is of some economic importance in stored oil. There are however significant relationships between the heated and chilled foots in stored oil when large numbers of samples are tested and statistically correlated.

The methods of the two tests for foots are even more unreliable when applied to stored oil than when used with fresh oil. The frequency and economic importance of these characteristics which cause stored oil not to meet specifications indicate that improved methods are vitally needed to determine nonoil constituents over those now used under specifications.

There should be no decrease in the market value because of quality deterioration for average-quality, raw linseed oil as produced, when stored up to five years in large lots (in tanks filled to capacity) and stored in the colder areas of the United States. Even tanks of oil filled to capacity with quantities as low as one million pounds should store well in the general area of the Great Lakes ports, which is also close to the areas of the greatest production of flaxseed.

For the same-size lots of oil stored in tanks to capacity, the oil should decrease in quality to less market value more in the warmer areas of the country, with most deterioration in the South near the port of New Orleans.

However, even when the oil is stored in smaller lots and under the most undesirable conditions of temperature as in the warmer areas, the changes in the various characteristics do not decrease the value of such oil much under market value for oil meeting specifications.

The cost of transportation of oil from the warmer areas of production to areas where storage conditions are good would be much greater (around 1 to 2c per pound) than the cost of deterioration if stored in the warmer areas except for oils which were of the poorest quality at the time of production. (Some oils were estimated as having values up to 3c per pound under the market for oil meeting specifications at 14c).

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• *Obituary*

LUCIEN BROWN FORBES (1918), owner of the L. B. Forbes Laboratory at Little Rock, Ark., until his retirement in 1947, died June, 1959, at St. Petersburg, Fla., according to information received from E. H. Tenent Sr. of Memphis.

He was a member of the Society of Cotton Products Analysts, which in 1920 changed its name to the American Oil Chemists' Society, and served as third vice president in 1930; second vice president in 1935; and third vice president in 1941.

A native of Alabama, Mr. Forbes opened his own laboratory at Little Rock in 1928 after having worked for General Electric in Schenectady, N.Y., and the American Cotton Oil Company at Memphis and Little Rock.

American Felt Company, New York, has recently introduced a new filter cartridge line, utilizing carefully processed new synthetic fibers in an uniquely constructed filter medium for controlled particle filtration.