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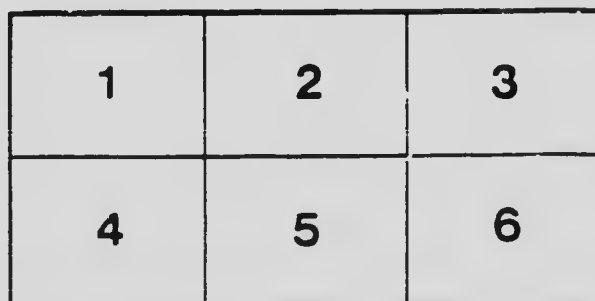
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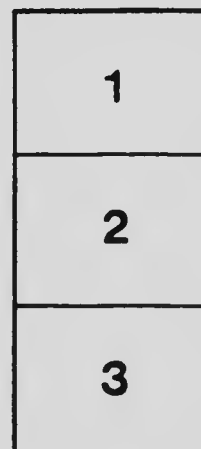
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LABORATORY
OF THE
INLAND REVENUE DEPARTMENT
OTTAWA, CANADA

BULLETIN No. 266

LINSEED OIL

LABORATORY
OF THE
INLAND REVENUE DEPARTMENT
OTTAWA, CANADA

BULLETIN No. 266

LINSEED OIL

OTTAWA, September 6, 1913.

WM. HIMS WORTH, Esq.,
Deputy Minister,
Inland Revenue.

SIR, I beg to hand you herewith a report dealing with Linseed Oil. This report gives you, in synoptical form, the analytical results obtained with, and other information concerning, fifty-three samples (53) purchased by our inspectors during December of last year and January of the present year.

Linseed Oil comes within the scope of the Adulteration Act both as a drug and as a paint material, being included, in admixture with white lead, in Schedule 4 of the Act.

Regarded as a drug, it is described by the British Pharmacopoeia as follows:—
(Ed. 1898).

"The oil expressed from Linseed at ordinary temperature. Characters: viscid, yellow, with a faint but distinct odour and bland taste. Specific gravity, 0.930 to 0.940. It is soluble in 10 parts of alcohol (90 per cent) and in oil of turpentine. It gradually thickens by exposure to the air, forming, when spread in a thin layer on glass, a hard, transparent varnish. It does not congeal above 4 deg. Fahr. (—20 deg. C.),

This description refers to the article known as Raw Oil.

The chief value of Linseed Oil derives from its use as a paint and varnish material. It rapidly absorbs atmospheric oxygen, with formation of a tough, resinous material which is the best known example of a so-called "drying" oil. The readiness with which it takes up oxygen is increased by heating to 180 deg C., and especially by heating in presence of certain metallic oxides or salts. When it has undergone this treatment it is known as "Boiled" Oil.

Owing to the fact that commercial Linseed is never pure, it follows that the oil expressed from such seed varies in character, within limits, depending upon the nature and amount of foreign seeds in admixture. The following extremes are quoted from Allen's Commercial Organic Analysis, 4th Ed., Vol. II, p. 70:—

Specific gravity at 15.5 deg. C.	0.9315 to 0.9410
Solidification point.	—16 deg. to —27 C.
Melting point of fatty acids.	17 " to 24 C.
Saponification value.	190 " to 201
Reichert Meissl value.	0
Helmer value.	95 to 95.5
Iodine value.	175 to 201

Linseed oil, both raw and boiled, is frequently adulterated by addition of hydrocarbons, rosin oil and fish oils. Cotton seed oil has sometimes been employed as an adulterant, and soya bean oil is suspected.

Owing to the great variety and diverse character of available adulterants for linseed oil, and to the inevitable variability of the article even when commercially genuine, the detection of adulteration in linseed oil is far from being a simple matter. Large buyers of linseed oil would do well to furnish specifications of the article they demand, or purchase by sample. The American Society for Testing Materials fixed the following specifications for the year 1900 (Oil and Colour Journal, 1900, 36):—

Raw Linseed Oil.	Max.	Min.
Specific gravity at 15 Deg.	0.936	0.932
" " at 15 "	0.931	0.927
Acid number	6.000	189
Saponification value	195.5	189
Unsaponifiable matter	1.5	1.4700
Refractive Index at 25 Deg	1.4805	178
Haus's Iodine value	190	180

The accompanying tables will furnish information regarding Linseed Oil as found in Canadian markets. Since most of these samples were supplied as for use in the arts, and not as drugs, it would not be just to apply to them, in strictness, the Standard of the British Pharmacopœia. As judged upon the whole results of analysis, I have been able to classify them as follows:—

Apparently genuine	36 samples.
Of doubtful genuineness	10 "
Adulterated	7 "
Total	53 "

The chief adulteration found consists in addition of mineral oil, which undoubtedly forms the main adulterant on this continent.

This is the first occasion upon which a systematic examination of Linseed Oil has been made under the Adulteration Act, and the principal value of this report consists in its bringing to notice the fact that adulteration of linseed oil is not unknown in Canada. There can be no doubt that the most effective way to prevent adulterated linseed oil coming into our country would be the adoption of the plan which I have already recommended, namely, the purchase of the article to carefully prepared specification.

I beg to recommend the publication of this report as Bulletin No. 266.

I have the honour to be, Sir,

Your Obedient Servant,

A. MCGILL,

Chief Analyst.

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Cost.		Name and Address of Manufacturer or Furnisher as given by Vendor.	
				Quantity.	Cents.	Manufacturer.	Furnisher.

DISTRICT OF NOVA SCOTIA—

1913.							
Jan. 16	Linseed Oil.	46651	Wm. Stairs Son & Morrow, Halifax, N.S.	1 qt.	25	Canadian Linseed Oil Co., Toronto.	Mfrs.
" 16	"	46652	Crowell Bros., Halifax, N.S.	1 "	25	"	"
" 16	"	46653	A. M. Bell & Co., Halifax, N.S.	1 "	30	Unknown	Unknown
" 14	"	46654	Nat. Drug Co., Halifax, N.S.	1 "	45	Dominion Linseed Oil Co., Toronto.	Mfrs.
" 16	"	46655	Wm. Stairs Son & Morrow, Halifax, N.S.	1 "	23	Canadian Linseed Oil Co., Toronto.	"
" 24	"	46656	Jas. Simond Co., Dartmouth, N.S.	1 "	25	"	"

DISTRICT OF QUEBEC—

1912.							
Dec. 19	Linseed Oil.	37292	H. Young, 111 Rue du Pont, Quebec.	3 pints	43	Canadian Seed Oil Co.	Mfr.
" 20	"	37293	E. Martineau, 135 Rue St. Joseph, Quebec.	1 "	45	Irving Williams B.	"
" 20	"	37294	C. A. Parent, 105 Rue St. Joseph, Quebec.	1 "	50	Canadian Seed Oil Co.	"
" 19	"	37295	N. Young, 111 Rue du Pont, Quebec.	1 "	43	"	"
" 20	"	37296	E. Martineau, 135 Rue St. Joseph, Quebec.	1 "	45	Irving Williams B.	"
" 21	"	37297	C. A. Parent, 105 Rue St. Joseph, Quebec.	1 "	50	Canadian Seed Oil.	"

DISTRICT OF EASTERN QUEBEC—

Dec. 24	Linseed Oil.	53303	Talbot Ltd., Rimouski, P.Q.	1 pt.	17	Oil, Montreal...	...
" 24	Oil.....	53304	" " "	1 "	17	"	...
" 26	Linseed Oil.	53309	T. Pelletier, Fraserville, P.Q.	1 "	15	Livingston Linseed Oil, Montreal.	...
" 27	"	53312	Union Agricole, St. Pascal, P.Q.	1 "	20	Sherwin-Williams, Co.,	...
" 27	Oil.....	53313	" " "	1 "	20	"	...

LINSEED OIL.

Inspector's Report. (Is not an expression of Opinion).	Results of Analysis.						Remarks and Opinion of the Chief Analyst.
	Sp. Gr. of Sample at 15.5°c.	Saponification Number.	Maumene.	Spot Test.	Unsaponifiable Matter.	Time of Drying at 70°c.	

R. J. WAUGH, INSPECTOR.

Boiled	0.935	198.9	117.5	Linseed		2 hours	46651
"	0.935	191	112	Slight indication of mineral & other oils.	2.04	15 "	46652 Doubtful.
"	0.941	199.5	111	Indicates adulteration.	1.65	36 "	46653 "
Raw	0.934	196	116	Linseed		48 "	46654
"	0.932	198	112	"		48 "	46655
"	0.932	197.8	111	"		48 "	46656

F. X. W. E. BELAND, INSPECTOR.

Boiled	0.935	196	105	Linseed		24 hours ..	37292
"	0.937	190	118	"		2.70 12 "	37293
"	0.938	198.7	106	"		20 "	37294
Raw	0.935	154.5	108	Indication of mineral oil.	19.76	36 "	37295 Adulterated.
"	0.935	194.6	120	"		36 "	37276
"	0.933	193.2	108	"		36 "	37297

A. PELLETIER, INSPECTOR.

Raw	0.934	196	114	"		36 hours	53303
Boiled	0.934	186.3	120	"		5.00 30 "	53304 Doubtful
"	0.935	176.8	128	Indicates foreign oil.	5.12	15 "	53309 "
Raw	0.942	189	119	Linseed		20 "	53312
Boiled	0.932	196.5	114	"		48 "	53313

BULLETIN No. 266—

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Cost.		Name and Address of Manufacturer or Furnisher as given by the Vendor.	
				Quantity.	Cents.	Manufacturer.	Furnisher.

DISTRICT OF EASTERN TOWNSHIPS—

1913.							
Jan. 29	Linseed Oil.	51166	W. C. Webster & Sons, Coaticook.	1 qt.	25		
" 30	"	51167	E. Boucher, St. Hyacinthe.	1 "	25		
" 30	"	51168	S. Bourgeois Co., Incorporated St. Hyacinthe.	1 "	20		
" 29	"	51169	W. C. Webster & Sons, Coaticook.	1 "	25		
" 30	"	51170	E. Boucher, St. Hyacinthe.	1 "	25		
" 30	"	51171	Beaunoyer & Lalime, St. Hyacinthe.	1 "	30		

DISTRICT OF MONTREAL—

Jan. 8	Linseed Oil.	51082	H. Sylvester & fils, 1111 St. Lawrence Boulevard, Montreal.	3 pts.	45	Mount Royal Colour & Varnish Co., Ltd.	
" 8	"	51083	The People's Hardware Co., 152 St. Lawrence Boulevard Montreal.	3 "	45		
" 8	"	51084	Beaunoyer & Bronillet, 1387 St. Lawrence Boulevard, Montreal.	3 "	45	Mount Royal Colour & Varnish Co., Ltd.	
" 8	"	51085	St. Lawrence Hardware Co., 993 St. Lawrence Boulevard Montreal.	3 "	36	A. Ramsay Son & Co.	
" 8	"	51086	The People's Hardware Co., 152 St. Lawrence Boulevard Montreal.	3 "	45		
" 10	"	51087	A. Goyette, 124 Mount Royal Ave., Montreal.	3 "	45		

DISTRICT OF OTTAWA—

1912.							
Dec. 27	Linseed Oil.	51677	Hull Medical Hall, Hull, P.Q.	24 oz.	40		Imperial Oil Co. Ottawa.
" 30	"	51678	D. J. Stalker, Ottawa.	3 lbs.	75	Imperial Oil Co. Ottawa.	Mfrs.
" 31	"	51679	Mulhall Hardware Co., Ottawa.	24 oz.	16	Dom. Linseed Oil Co., Montreal.	"
" 27	"	51680	Adam Scott, Almonte.	1 qt.	25	Sherwin Williams Co. Montreal.	
" 30	"	51681	Cuzner Hardware Co., Ltd., Ottawa.	1 "	25	Standard Linseed Oil Co., Cleveland, U.S.	
" 31	"	51682	Mulhall Hardware Co., Ottawa.	24 oz.	16	Dom. Linseed Oil Co., Montreal.	

LINSEED OIL.

Inspector's Report (Is not an expression of Opinion).	Results of Analysis.						No. of Sample.	Remarks and Opinion of the Chief Analyst.
	Sp. Gr. of Sample at 15.5°c.	Saponification Number.	Maumene.	Spot Test.	Unsataponifiable Matter.	Time of Drying at 70°c.		

L. J. COSTIGAN, ACTING INSPECTOR.

Boiled	0.934	195.0	106	Linseed		30 hours....	51166	
.....	0.932	176.4	108	Mineral and other oils.	8.10	24 "	51167	Adulterated.
.....	0.934	197.2	105	Linseed		30 "	51168	
.....	0.934	196.0	116	"		36 "	51169	
"	0.937	194.6	122	"		48 "	51170	
"	0.933	194.3	114	"		36 "	51171	

J. J. COSTIGAN, INSPECTOR.

Raw	0.935	196.5	116	Linseed		36 hours....	51082	
"	0.935	193.2	110	"		48 "	51083	
Boiled	0.909	150.0	94	Mineral		24 "	51084	Adulterated.
"	0.934	191.5	122	Linseed		36 "	51085	
"	0.936	185.0	96	Indication of Foreign Oils	5.40	24 "	51086	Doubtful.
.....	0.936	196.2	112	Linseed		48 "	51087	

J. A. RICKY, INSPECTOR.

Raw	0.934	194.3	112	Linseed		40 hours....	51677	
"	0.935	194.8	120	"		36 "	51678	
"	0.933	190.0	116	"		36 "	51679	
Boiled....	0.933	189.3	103	"	1.79	24 "	51680	
"	0.941	162.0	99	Mineral	15.30	24 "	51681	Adulterated.
"	Broken.						51682	

BULLETIN No. 266--

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Cost.		Name and Address of Manufacturer or Furnisher as given by the Vendor.	
				Quantity.	Cents.	Manufacturer.	Furnisher.

DISTRICT OF KINGSTON--

1912.							
Dec. 16	Linseed Oil.	53036	W. A. Mitchell, Kingston....	3 pts.	45	.....	Dalton & Son, Kingston.
" 16	"	53037	A. Chown & Co., Kingston...	3 "	23	Livingston, Mon-	.....
" 16	"	53038	J. B. Bunt & Co., Kingston...	3 "	45	treal.	.....
" 16	"	53039	W. A. Mitchell, Kingston....	3 "	45	Southern States Turpentine Co., Cleveland.	.....
" 16	"	53040	A. Chown & Co., Kingston...	3 "	24	.....	Dalton & Son, Kingston.
" 16	"	53041	J. B. Bunt & Co., Kingston...	3 "	45	Shering, Mon-	.....
" 16	"	53041	J. B. Bunt & Co., Kingston...	3 "	45	treal.	.....
" 16	"	53041	J. B. Bunt & Co., Kingston...	3 "	45	Livingston, Mon-	.....
" 16	"	53041	J. B. Bunt & Co., Kingston...	3 "	45	treal.	.....

DISTRICT OF TORONTO--

Dec. 19	Linseed Oil.	49496	P. H. Finkle, 1520 Queen St. west, Toronto.	3 pts.	40	.....	Sanderson Percy Co., Ltd., Toronto.
" 27	Oil.....	49497	Howard Furnace Hardware Co., 371 Yonge St., Toronto.	1 qt.	35	.....	Reynolds Bros., Toronto.
" 27	"	49498	Geo. Pearsall & Son, 417 Yonge St., Toronto.	1 "	35	.....	The Sherwin-Williams Co., Toronto.
" 24	"	51581	Geo. Matthewson, 734 Queen St. east, Toronto.	1 "	25	.....	Turpentine Producing Agency, Toronto.
" 26	"	51582	May Bros., 1680 Dundas St. 1680 Dundas St. west, Toronto.	1 1/2 pt.	45	.....	"
" 27	"	51583	T. W. Brown, 242 Carleton St., Toronto.	1 qt.	50	.....	"

DISTRICT OF VICTORIA--

1913.							
Jan. 21	Linseed Oil.	53513	E. B. Marion & Co., 1202 Wharf St., Victoria, B.C.	3 pts.	.....	Sherwin-Williams, Mon-	.....
" 21	"	53514	P. McQuade & Son, 1214 Wharf St., Victoria, B.C.	3 "	65	treal.	.....
" 21	"	53515	B.C. Hardware Co., Ltd., 825 Fort St., Victoria.	3 "	40	J. T. Donald & Co., Glasgow.	.....
" 21	"	53516	E. B. Marvin & Co., 1202 Wharf St., Victoria.	3 "	.....	.....	B. A. Paint Co., Victoria, B.C.
" 21	"	53517	P. McQuade & Son, 1214 Wharf St., Victoria.	3 "	60	Sherwin-Williams, Mon-	.....
" 21	"	53518	B.C. Hardware Co., Ltd., 825 Fort St., Victoria.	3 "	35	treal.	.....
" 21	"	53518	B.C. Hardware Co., Ltd., 825 Fort St., Victoria.	3 "	35	J. T. Donald & Co., Glasgow.	.....
" 21	"	53518	B.C. Hardware Co., Ltd., 825 Fort St., Victoria.	3 "	35	.....	B. A. Paint Co., Victoria, B.C.

LINSEED OIL.

Inspector's Report. (Is not an expression of Opinion).	Results of Analysis.						Remarks and Opinion of the Chief Analyst.
	Sp. Gr. of Sample at 15.5 c.	Saponification Number.	Maumene.	Spot Test.	Unsaponifiable Matter.	Time of Drying at 70 c.	

JAS. HOGAN, INSPECTOR.

Raw	0.934	197.1	112	Linseed		48 hours	53036	
"	0.934	195.6	110	"		36 "	53037	
"	0.932	159	106	Indication rosin oil.	19.50	48 "	53038	Adulterated.
"	0.934	189	118	Indicates adul- teration.	8.34	20 "	53039	"
"	0.937	189.7	119	Linseed	2.66	15 "	53040	
"	0.934	194	115	"		15 "	53041	

H. J. DAGER, INSPECTOR.

Raw	0.931	194.6	120	Linseed		48 hours	49496	
"	0.925	145	91	Indication mineral oil.		36 "	49497	Doubtful.
"	0.932	194.9	110	Linseed		48 "	49498	
Boiled	0.933	157.8	101	Mineral		24 "	51581	Doubtful.
"	0.924	156	103	"		36 "	51582	Adulterated.
"	0.930	147.7	90	"		24 "	51583	Doubtful.

D. O'SULLIVAN, INSPECTOR.

Raw	0.933	194	115	Linseed		36 hours	53513	
"	0.931	194.3	129	"		48 "	53514	
"	0.930	191.3	128	"		48 "	53515	
Boiled	0.933	189.9	124	"		24 "	53516	
"	0.946	189.3	112	Indication mineral oil.	5.00	30 "	53517	Doubtful.
"	0.936	195.6	117	Mineral and other oils.	1.94	20 "	53518	"

