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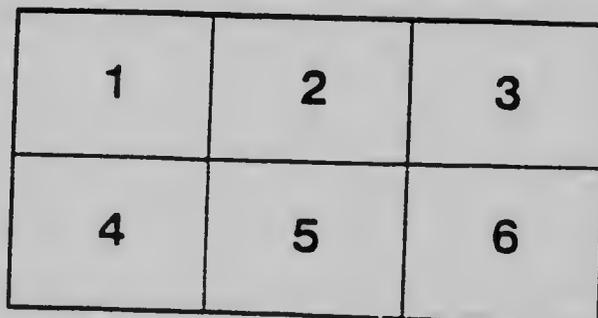
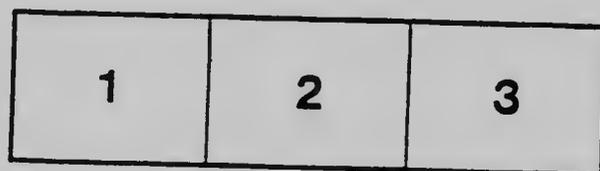
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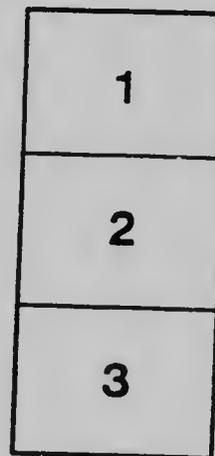
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O. H. M. S.

*W. J. Gerald*  
Deputy Minister.

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LABORATORY  
OF THE  
INLAND REVENUE DEPARTMENT  
OTTAWA, CANADA

BULLETIN No. 175

LIQUOR ARSENICALIS (FOWLER'S SOLUTION)

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BULLETIN No. 175

LIQUOR ARSENICALIS (FOWLER'S SOLUTION)

OTTAWA, February 26, 1909.

WM. HIMSWORTH, Esq.,  
Acting Deputy Minister of Inland Revenue.

SIR,—I have the honour to hand you a report upon 75 samples of *Liquor Arsenicalis*, commonly known as Fowler's Solution, collected throughout Canada in January of this year.

This important drug is defined as follows by the British Pharmacopœia:—

*Liquor Arsenicalis*.—*Arsenical Solution*.

Synonyms:—Liquor Potassæ Arsenitis; Fowler's Solution.

	Metric.
Arsenious Anhydride in Powder . . . . .	10 grammes.
Potassium Carbonate . . . . .	10 "
Compound Tincture of Lavender . . . . .	Ald. Drams. 31·25 cubic centimetres
Distilled Water . . . . .	a sufficient quantity.

Heat the Arsenious Anhydride and the Potassium Carbonate with 10 fluid ounces (or five hundred cubic centimetres) of Distilled Water in a one-pint (or one litre) flask until a clear solution is obtained, cool, add the Compound Tincture of Lavender and sufficient Distilled Water to produce one pint (or one thousand cubic centimetres) of the Solution.

*Characters and Tests*.—A reddish liquid, alkaline to test paper, and having the odour of lavender, 25 cubic centimetres, neutralized with *hydrochloric acid*, and diluted with *water*, should discharge the colour of 50·8 to 50·9 cubic centimetres of the volumetric solution of *Iodine*, the presence of a slight excess of *sodium bi-carbonate* being maintained throughout the operation.

Dose.—2 to 8 minims.

110 minims contain 1 grain of Arsenious Anhydride.

100 cubic centimetres contain 1 gramme.

It is identical with the Liquor Potassii Arsenitis of the United States Pharmacopœia.

It contains one (1) per cent. of Arsenious Acid ( $As_2O_3$ ) weight in volume, and it is quite apparent that the British Pharmacopœia requires a degree of accuracy within one five hundredth ( $\frac{1}{500}$ ) of this amount, or 0.002 per cent. Arsenic. The method of assay prescribed by the Pharmacopœia is sufficiently delicate, if carried out with due precaution, to indicate this degree of accuracy. Making all necessary allowance, I conceive that no freshly prepared solution should vary more than 0.010 per cent. of arsenic from the standard or normal fixed. Fifteen (15) samples now reported fall within, or closely approximate to this limit, and these are designated in the Table as "Accurate" or nearly accurate." Of the remaining samples, eighteen (18) are found to vary from the standard by ten times this amount, or more; (0.100 per cent. Arsenic) and, of these, five (5) samples differ from the standard by 0.250 per cent. Arsenic, while two (2) samples contain only half the amount of Arsenic required by the Pharmacopœia.

The following synopsis presents a classification;—

*Liquor Arsenicalis.*

	Samples.
Within 0.010 of B. P. requirement.....	15
"    0.050    "    "    .....	21
Beyond 0.100    "    "    .....	18
Not classified.....	21
Total.....	75

While it would be correct, under Sec. 7 of the Adulteration Act (R.S. 1906, chap. 133), to declare most of the samples now reported, *adulterated*, I am of opinion that the object of the Act will be best attained by a publication of this report, and especially so, since this is the first occasion upon which the article named has been subjected to official inspection.

It is further to be remembered that a certain practicable limit of accuracy or degree of variation from an absolute standard, must be allowed for. This limit has not been fixed, and is only suggested or implied by the pharmacopœia itself, not explicitly stated therein.

I would respectfully suggest the wisdom of adopting 0.020 per cent. of arsenic as a maximum limit of variability in *Liquor Arsenicalis*; and beg to recommend the publication of this report as Bulletin No. 175.

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 the Vendor.
				Quantity	Cents.	

## DISTRICT OF NOVA SCOTIA—

1908.						
Jan. 12	Liquor Arsenic- 11% (Fowler's Solution.)	33826	G. A. Burbridge, Halifax, N.S.	4 oz.	40	Nat. Drug & Chem. Co., Halifax, N.S.
" 12	"	33827	Brown Bros. & Co., Halifax, N.S.	4 "	10	" " "
" 14	"	33828	Jas. D. Walsh, Halifax, N.S.	4 "	20	Vendor .....
" 20	"	33829	A. E. Smith, Truro, N.S.	4 "	25	Unknown .....
" 20	"	33830	F. J. Butcher, Dartmouth, N.S.	4 "	35	Nat. Drug & Chem. Co., Halifax, N.S.

## DISTRICT OF PRINCE EDWARD ISLAND—

Jan. 7	Liquor Arsenic- 11% (Fowler's Solution.)	31443	McDonald & McKinnon, Char- lottetown.	4 oz.	15	McDonald & McKinnon, Charlottetown.
" 7	"	31441	C. D. Rankin, Charlottetown.	4 "	20	Lyman, Knox & Co. Ltd., Montreal.
" 11	"	31445	Dr. John McNeill, Summer- side.	4 "	15	Nat. Drug & Chem. Co., Halifax.
" 12	"	31446	Jardine & Bernard, Kensing- ton.	4 "	15	Nat. Drug Co., Montreal....
" 14	"	31117	J. G. Jamieson, Charlotte- town.	4 "	20	J. G. Jamieson, Charlotte town.

## DISTRICT OF NEW BRUNSWICK—

Jan. 11	Liquor Arsenic- 11% (Fowler's Solution.)	29877	E. Clinton Brown, St. John, N.B.	4 oz.	43	E. Clinton Brown, St. John, N.B.
" 16	"	29878	Chas. A. Burchill, Frederic- ton, N.B.	4 "	40	Chas. A. Burchill, Frederic- ton, N.B.
" 18	"	29879	C. A. McKean, Woodstock, N.B.	4 "	25	Nat. Drug & Chem. Co. Ltd., St. John, N.B.
" 25	"	29880	B. J. Sharp, Sussex, N.B.	4 "	15	B. J. Sharp, Sussex, N.B....
" 26	"	29881	Fairweather Bros., Moncton, N.B.	4 "	20	Fairweather Bros., Moncton, N.B.

## DISTRICT OF QUEBEC—

Jan. 11	Liquor Arsenic- 11% (Fowler's Solution.)	36803	A. Martineau, 734 St. Valur St., Quebec.	4 oz.	10	A. Martineau, Quebec.....
" 11	"	36804	Jos. Masson, 808 St. Valur St., Quebec.	4 "	10	Jos. Masson, Quebec.....
" 12	"	36805	G. P. Plamondon, 122 St. Jos- eph St., Quebec.	4 "	15	A. Leclerc, Quebec.....
" 12	"	36806	F. Lachevrotière, 224 St. Jean St., Quebec.	4 "	30	Lynan Sons, Montreal....
" 42	"	36807	C. P. Delisle, 379 St. Jean St., Quebec.	4 "	15	Brunette et Cie, Quebec....

## LIQUOR ARSENICALS (FOWLER'S SOLUTION.)

Inspector's Report.	RESULTS OF ANALYSIS.				Remarks and Opinion of the Chief Analyst.
	Cubic Centi- meters (bei- Normal lod- ine used for 25 cc. of Sample.	Equivalent Arsenic per Centage. (K P. requires 1.000)	Below Stan- dard p. c. Arsenic.	Above Stan- dard p. c. Arsenic.	
<b>R. J. WAUGH, INSPECTOR.</b>					
.....	30.9	0.782	0.218	.....	Too great deviation from standard.
.....	49.0	0.964	0.036	.....	.....
.....	45.4	0.892	0.108	.....	Too great deviation from standard.
.....	40.2	0.788	0.212	.....	Too great deviation from standard.
.....	48.2	0.948	0.052	.....	.....
<b>THEO. MOORE, INSPECTOR.</b>					
.....	48.3	0.950	0.050	.....	.....
.....	49.5	0.974	0.026	.....	.....
.....	45.7	0.898	0.102	.....	Too great deviation from standard.
.....	50.5	0.994	0.006	.....	Accurate.
.....	49.0	0.964	0.036	.....	.....
<b>J. C. FERGUSON, INSPECTOR.</b>					
.....	47.9	0.942	0.058	.....	.....
.....	50.3	0.990	0.010	.....	Accurate.
.....	50.3	0.999	0.010	.....	Accurate.
.....	34.3	0.670	0.330	.....	Too great deviation from standard.
.....	49.5	0.974	0.026	.....	.....
<b>E. BELAND, INSPECTOR.</b>					
.....	37.7	0.738	0.262	.....	Too great deviation from standard.
.....	44.9	0.862	0.113	.....	Too great deviation from standard.
.....	54.9	1.082	.....	0.082	.....
.....	50.0	0.984	0.016	.....	Nearly accurate.
.....	50.9	1.002	.....	0.002	Accurate.

## BULLETIN No. 175—LIQUOR

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.	

## DISTRICT OF ST. HYACINTHE—

1908.						
Jan.	11	Liquor Arsenica 11a (Fowler's Solution.)	901	Pharmacie Provost, Sorel. . . . .	2 1/2 oz.	05 Lyman Sons & Co., Montreal.
"	12	"	902	Pharmacie Massicotte, Victo- riaville.	4 " . . .	10 Lyman Bros, Montreal. . .
"	14	"	903	E. C. Drolet, Coaticook. . . . .	4 " . . .	10 M. Baldwin . . . . .
"	19	"	904	Dr. J. B. Comeau, Farnham. . . .	4 " . . .	40 Lyman Sons & Co., Montreal.
"	21	"	905	Pharmacie Ostigny. . . . .	4 " . . .	15 Vendor . . . . .

## DISTRICT OF MONTREAL—

Jan.	6	Liquor Arsenica 11a (Fowler's Solution.)	32681	J. J. Weinfeld, 458 St. Law- rence St., Montreal.	4 oz. . .	50 . . . . .
"	7	"	32682	Dr. J. T. A. Gauthier, Valley field.	4 " . . .	50 Lyman Sons & Co., Montreal.
"	8	"	32683	A. Goyette, 141 St. Catherine E., Montreal.	4 " . . .	25 . . . . .
"	13	"	32684	Dr. Henri Campeau, 1393 Notre Dame W., Montreal.	4 " . . .	25 Not known. . . . .
"	14	"	32685	Dr. J. A. Clement, 14th Ave., Lachine.	4 " . . .	20 Kent & Stevenson, Montreal.

## DISTRICT OF OTTAWA—

Jan.	5	Liquor Arsenica 11a (Fowler's Solution.)	22796	W. A. McCrea, Hawkesbury. . . .	4 oz. . .	20 Kerry Watson, Montreal. . .
"	12	"	22797	Geo. E. Moore, Carleton Place . .	4 " . . .	35 Nat. Drug & Chem. Co., Ottawa.
"	18	"	22808	W. C. Hanes, Ottawa . . . . .	4 " . . .	40 Not known. . . . .
"	21	"	22799	W. F. Gibson, Ottawa. . . . .	4 " . . .	35 Nat. Drug & Chem. Co., Ottawa.
"	21	"	22800	J. Skinner & Son, Ottawa. . . . .	4 " . . .	35 Vendor. . . . .

## DISTRICT OF KINGSTON—

Jan.	8	Liquor Arsenica 11a (Fowler's Solution.)	39426	W. W. Gibson, Kingston. . . . .	4 oz. . .	40 W. W. Gibson, Kingston. . .
"	11	"	39427	D. Blecker, Belleville. . . . .	4 " . . .	15 Nat. Drug Co. . . . .
"	11	"	39428	A. L. Geon, Belleville. . . . .	4 " . . .	20 " . . . . .
"	11	"	39429	W. J. B. Davison, Port Hope. . . .	4 " . . .	20 W. J. B. Davison, Port Hope.
"	12	"	39430	McDermid & Jury, Peterboro. . . .	4 " . . .	20 Lyman Bros., Toronto . . . .

ARSENICALS (FOWLERS SOLUTION.)

Inspector's Report.	RESULTS OF ANALYSIS.					Remarks and Opinion of the Chief Analyst.
	Cubic Centimetres Decimetric Normal Ind. line used for 25 cc. of Sample.	Equivalent Arsenic per Centage. (B. P. require 1.000.)	Below Standard p.c. Arsenic.	Above Standard p.c. Arsenic.		

J. C. ROULEAU, INSPECTOR.

.....	47.6	0.936	0.064		
.....	51.5	1.014		0.014	Nearly accurate.
.....	50.5	1.000	0.000		Accurate.
.....	52.2	1.028		0.028	
.....	47.5	0.931	0.066		

J. J. COSTIGAN, INSPECTOR.

.....	50.0	1.002		0.002	Accurate.
.....	51.6	1.016		0.016	Nearly accurate.
.....	48.7	0.958	0.042		
.....	28.9	0.562	0.438		Too great deviation from standard.
.....	42.5	0.831	0.166		Too great deviation from standard.

J. A. RICKEY, INSPECTOR.

.....	47.7	0.938	0.062		
.....	48.7	0.958	0.042		
.....	45.6	0.896	0.104		Too great deviation from standard.
.....	48.7	0.958	0.042		
.....	50.7	0.998	0.002		Accurate.

JAS. HOGAN, INSPECTOR.

.....	20.8	0.400	0.600		Too great deviation from standard.
.....	47.6	0.936	0.064		
.....	45.0	0.884	0.116		Too great deviation from standard.
.....	48.0	0.944	0.056		
.....	49.1	0.966	0.034		

## BULLETIN No. 175—LIQUOR

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.	
<b>DISTRICT OF TORONTO—</b>						
1909.						
Jan. 11	Liquor Arsenicalis (Fowler's Solution).	36187	A. Boyle, Cor. York and McGill Sts., Hamilton.	4 oz.	20	J. Winer & Co., Ltd., Hamilton.
" 12	"	36188	J. A. Zimmerman, Hamilton.	4 "	25	Vendor .....
" 13	"	36189	A. C. Thorbourne, Niagara Falls.	4 "	10	" .....
" 15	"	36190	W. Erskine, St. Catharines.	4 "	20	Lyman Bros., Ltd., Toronto.
" 19	"	36191	The Burgess Powell Co., Ltd., Toronto.	4 "	25	" " ..
<b>DISTRICT OF LONDON—</b>						
Jan. 7	Liquor Arsenicalis (Fowler's Solution).	30558	Jas. Wilson, Goderich.....	4 oz.	20	Not known. ....
" 13	"	30575	W. A. McIntyre, St. Mary's.	4 "	40	Vendor .....
" 14	"	30583	R. J. Eason, Stratford .....	4 "	35	" .....
" 16	"	30584	Walter Beattie, Guelph .....	4 "	40	" .....
" 16	"	30590	A. B. Petrie, Guelph .....	4 "	40	" .....
<b>DISTRICT OF WINDSOR—</b>						
Jan. 7	Liquor Arsenicalis (Fowler's Solution).	34736	Clement Drug Co., Sarnia....	4 oz.	40	Clement Drug Co., Sarnia...
" 7	"	34738	Geo. G. Ingersoll, Sarnia....	4 "	40	Nat. Drug Co., London, O..
" 8	"	34744	Jackson & Co., Petrolia.....	4 "	25	" " ..
" 9	"	34747	G. G. Stevenson, London, O.	4 "	20	Vendors.....
" 12	"	34754	Anderson & Nelles, London, O.	4 "	20	Anderson & Nelles, London, O.
<b>DISTRICT OF MANITOBA—</b>						
Jan. 12	Liquor Arsenicalis (Fowler's Solution).	35826	P. F. Braund, Winnipeg.....	4 oz.	35	Not given .....
" 12	"	35827	Austin's Drug Store, Winnipeg	4 "	20	The Bole Drug Co., Winnipeg
" 12	"	35828	Cranston's Drug Store, Winnipeg.	4 "	25	Not given ..
" 13	"	35829	Kennedy's Pharmacy, Brandon.	4 "	25	Kennedy's Pharmacy, Brandon, Man.
" 13	"	35830	W. J. Halpin & Co., Brandon.	4 "	25	Not given .....

ARSENICALIS (FOWLER'S SOLUTION).

Inspector's Report.	RESULTS OF ANALYSIS.				Remarks and Opinion of the Chief Analyst.
	Cubic Centimetres Decimetre used for 25 cc. of Sample.	Equivalent Arsenic per centage. (H. P. requires 1,000).	Below Standard p. c. Arsenic.	Above Standard p. c. Arsenic.	
<b>H. J DAGER, INSPECTOR.</b>					
.....	46.9	0.922	0.078	.....	Too great deviation from standard.
.....	47.4	0.932	0.068	.....	
.....	45.2	0.888	0.112	.....	
.....	49.0	0.964	0.033	.....	
.....	48.5	0.954	0.046	.....	
<b>T. KIDD, INSPECTOR.</b>					
.....	54.2	1.068	.....	0.068	Too great deviation from standard.
.....	42.0	0.836	0.164	.....	
.....	54.1	1.066	.....	0.066	
.....	54.4	1.072	.....	0.072	
.....	39.6	0.776	0.224	.....	
<b>J. TALBOT, INSPECTOR.</b>					
.....	45.9	0.902	0.098	.....	Nearly accurate.
.....	50.2	0.988	0.012	.....	
.....	46.4	0.912	0.088	.....	
.....	49.4	0.972	0.028	.....	
.....	52.2	1.028	.....	0.028	
<b>A. C. LARIVIERE, INSPECTOR.</b>					
.....	50.6	0.996	0.004	.....	Accurate.
.....	25.8	0.500	0.500	.....	Too great deviation from standard.
.....	46.3	0.910	0.090	.....	
.....	50.1	0.984	0.016	.....	
.....	46.8	0.920	0.080	.....	

## BULLETIN No. 175—LIQUOR

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.	
DISTRICT OF CALGARY—						
1909.						
Jan. 15	Liquor Arsenicalis (Fowler's Solution).	35376	C. A. Wallace, Calgary...	4 oz.	50	Nat. Drug and Chem. Co., Montreal.
" 15	"	35377	McCutcheon & McGill, Calgary	4 "	50	" " "
" 15	"	35378	O. H. Bott, Calgary.....	4 "	25	O. H. Bott, Calgary.....
" 15	"	35379	Jas. Finlay Drug Co., Calgary	4 "	25	Lyman & Sons, Calgary. ...
" 15	"	35380	Curry & Cope, Calgary.....	4 "	25	Curry & Cope, Calgary.....
DISTRICT OF VANCOUVER—						
Jan. 29	Liquor Arsenicalis (Fowler's Solution).	37571	The Public Drug Co., Vancouver.	4 oz.	60	Vendor . . . . .
" 29	"	37572	Woods Pharmacy, Vancouver.	4 "	50	" . . . . .
" 29	"	27573	McDonald & Burns, Vancouver	4 "	25	Nat. Drug Co., Vancouver ..
" 29	"	37574	W. A. Harrison, Vancouver ..	4 "	50	Vendor . . . . .
" 29	"	37575	McDowell, Atkins & Watson, Vancouver.	4 "	10	Not known.....
DISTRICT OF VICTORIA—						
Jan. 26	Liquor Arsenicalis (Fowler's Solution).	39284	Dean & Hiscocks, Victoria ...	4 oz.	25	Vendors . . . . .
" 26	"	39285	Hall & Co., Victoria.....	4 "	30	" . . . . .
" 26	"	39286	W. Jackson & Co., Victoria...	4 "	25	" . . . . .
" 27	"	39287	W. E. Terry, Victoria.....	4 "	40	" . . . . .
" 39	"	39288	D. E. Campbell, Victoria.....	4 "	35	" . . . . .

## ARSENICALIS (FOWLER'S SOLUTION).

Inspector's Report.	RESULTS OF ANALYSIS.				Remarks and Opinion of the Chief Analyst.
	Cubic Centimetres Decimetre Normal Iodine used for 25 cc. of Sample.	Equivalent per centage. (B. P. requires 1,000).	Below Standard p. c. Arsenic.	Above Standard p. c. Arsenic.	
<b>R. W. FLETCHER, INSPECTOR.</b>					
.....	48.8	0.960	0.040	.....	
.....	42.6	0.836	0.164	.....	Too great deviation from standard.
.....	46.4	0.912	0.083	.....	
.....	50.3	0.990	0.010	.....	Accurate.
.....	50.4	0.992	0.008	.....	"
<b>J. F. POWER, INSPECTOR.</b>					
.....	49.2	0.968	0.032	.....	
.....	46.2	0.908	0.092	.....	
.....	46.9	0.922	0.078	.....	
.....	51.4	1.012	.....	0.012	Nearly accurate.
.....	48.3	0.950	0.050	.....	
<b>D. O'SULLIVAN, INSPECTOR.</b>					
.....	49.9	0.982	0.018	.....	
.....	43.5	0.834	0.166	.....	Too great deviation from standard.
.....	50.1	0.986	0.014	.....	Nearly accurate.
.....	49.3	0.970	0.030	.....	
.....	46.5	0.914	0.086	.....	

