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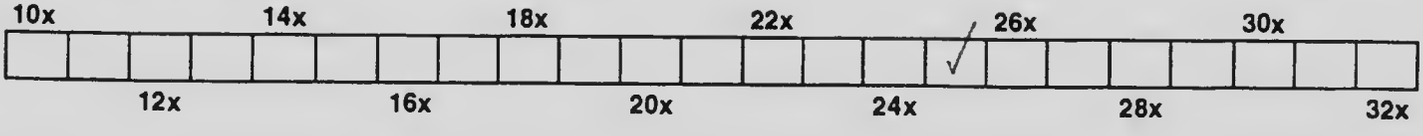


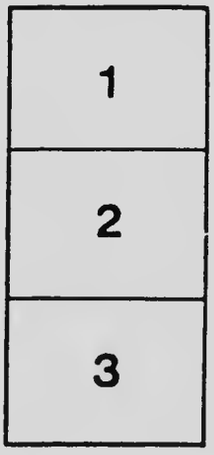


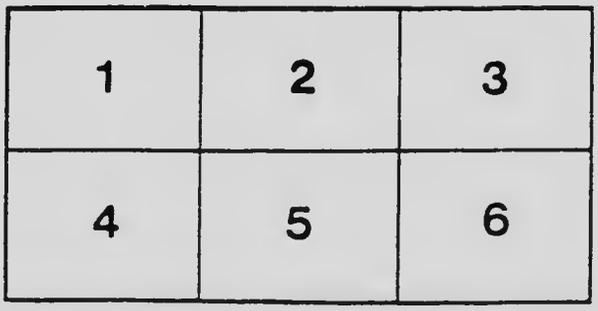

LABORATORY

OF THE

# INLAND REVENUE DEPARTMENT

OTTAWA, CANADA

## BULLETIN No. 386

# CASCARA SAGRADA

33136—1

## NOTES AND COMMENTS.

Under this heading, as occasion arises, the Bullotins issued by this Department will contain, as an appendix, such comment as may seem necessary or advisable upon matters relating to the work of the Department in connection with the administration of the Adulteration Act, the Fertilizers Act, tho Feeding Stuffs Act or the Proprietary Medicines Act.

It frequently happens that correspondonts ask informations regarding the above Acts, of such nature that the matter in question possesses general interest, and comment upon it would prove acceptable and useful to others than the immediate questioner. In such cases the reply may find a place in these columns. For convenience of reference these notes will be numbered in series.

A. McGILL,
*Chief Analyst.*

### Note 9.

### FEED MEALS, LINSEED MEAL, COTTONSEED MEAL, ETC.

These are usually ground from the linseed, cottonseed, or other press cakes, and do not represent the whole seed of the plant from which derived. Hence, these articles cannot be legally sold as Chop Feed, but must be sold as Registered Feeds, carrying a guaranteed minimum value in protein and fat and a maximum amount of fibre.

Purchasers are advised not to buy feeds of the class named, unless tho number under which registered and the guaranteed values are attached to the package.

*Chief Analyst.*

LABORATORY

OF THE

# INLAND REVENUE DEPARTMENT

OTTAWA, CANADA

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# BULLETIN No. 386

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## CASCARA SAGRADA

December 10, 1917.

J. U. VINCENT, Esq., K.C., B.A., L.Ph.,
Deputy Minister of Inland Revenue,

SIR,—Owing to the fact that I have received many complaints, from physicians and others during recent years, regarding the preparations of cascara sagrada which are found in commerce, it has been considered desirable to make an examination of these, and particularly of the liquid extract, and the aromatic syrup. Both of these are pharmacopœial preparations, and if the official directions for their manufacture were conscientiously carried out they should exhibit at least an approximation to uniformity of character. The results of analysis herein presented will show that this is far from being the case; and there can be no doubt that many samples contain very little genuine extractive of cascara.

Several samples have been sold under names which are not recognized by any pharmacopeia. Where such samples bear a registration number, they conform to the requirements of the Proprietary or Patent Medicines Act. Otherwise they are sold in contravention of this Act.

The analytical work has been done, as is usual, in this laboratory and in the sub-laboratories at Halifax, Winnipeg, and Vancouver. Owing to the special nature of the subject, investigatory work was entrusted to Mr. Westman and Mr. Rowat, and their report being necessarily of a highly technical character, it is impossible to present it otherwise than in extenso and to do justice to the great amount of labour which they have bestowed upon the problem. For this reason I submit their report in detail; and I believe that it will be read with interest by physicians and by manufacturers as well as by analytical chemists, and by the public.

The data furnished by it will, it is hoped, make possible such specifications and standards for preparations of cascara sagrada, as shall enable us to check these, and control them in the interest of the medical profession and the public.

In all, 162 samples have been analyzed as follows:—

| | | |
|---|---|---|
| At Ottawa | 76 | samples. |
| " Halifax | 28 | " |
| " Winnipeg | 32 | " |
| " Vancouver | 26 | " |
| Total | 162 | " |

This laboratory is specially indebted to Dr. J. M. Francis, Chief Chemist of the Parke, Davis Company, Detroit, for assistance in this investigation.

I beg to recommend publication of this report as Bulletin No. 386.

I have the honour to be, sir,

Your obedient servant,

A. McGILL,
*Chief Analyst.*

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December 6, 1917.

Dr. A. McGILL,
Chief Analyst,
Ottawa, Ont.

DEAR SIR,—We beg herewith to submit a report to you dealing with the analysis of seventy-six samples collected as liquid extract of cascara sagrada. We have included such data in our tables as was available from the work of other laboratories. As our report is the result of more exhaustive work than was undertaken at the branch laboratories and covers a much larger number of samples, it is found that the inclusion of this data in our tables does not greatly change our averages.

As this was the first time that a collection of this nature had been examined by these laboratories, it was found necessary not only to appeal very largely to original articles dealing with the subject, but to carry on certain investigatory work of a somewhat original nature in order to devise a means of evaluating such extracts, either relatively, or absolutely, from the viewpoint of chemical analysis.

Before approaching work of this kind a knowledge of the requirements of various pharmacopœias is essential as a constant guide. This information has been collected and is outlined below.

## PREPARATION AS DEFINED IN B. P. 1914 AND CODEX 1911.

Cascara sagrada is defined to be "The dried bark of Rhamnus purshiana D.C. and collected at least one year before being used."

The official preparations as defined in this edition, as far as liquids or fluids are concerned, are,

### 1. *Liquid Extract of Cascara Sagrada.*

| | |
|---|---|
| Cascara Sagrada in No. 20 powder.. .. .. .. .. .. .. .. | 1,000 grammes. |
| Alcohol (90%).. .. .. .. .. .. .. .. .. .. .. .. .. .. | 250 cc. |
| Distilled water sufficient to produce.. .. .. .. .. .. .. | 1,000 cc. |

Instructions are given to exhaust the cascara sagrada with the distilled water by the percolation process. This process is given in B. P. Appendix, 1914, p. 526, as follows: "Moisten the solid materials with the prescribed quantity of menstrum, set aside for four hours, in a well-closed vessel, pack in a percolator, add sufficient of the menstrum to saturate the materials and leave a layer of liquid above. Macerate for 24 hours; then allow percolation to proceed slowly until the percolate measures about three-fourths of the volume required for the finished tincture. Press the marc, mix the expressed liquid with the percolate and add sufficient of the menstrum to produce the required volume. Clarify by subsidence or filtration, if necessary."

Following this the percolate is evaporated to 600cc and the alcohol, previously mixed with sufficient distilled water to produce the required volume is added. Methods of percolation are quoted in detail for the reason that they differ and this difference might be the basis of slight varintions in genuine liquid extracts.

### 2. *Aromatic syrup of cascara. B.P. 1914, p. 877.*

Although the original intention was not to examine extracts of this nature, a considerable number were collected by our inspectors and since they form a large percentage of cascara preparations it seemed best to make some examination of their value. A large number of samples were sold simply as "Cascara Sagrada." Some of these were liquid extracts and some were aromatic. Being sold as above under a name that is not descriptive or definite in any sense it is to be implied that they do not claim to conform with any pharmacopœial standards. Analysis in many cases shows the correctness of this implication. It is to be noted at the same time that they are not sold as registered patent medicines.

The aromatic syrup of cascara B.P. contains:—

| | |
|---|---|
| Liquid Extract of Cascara Sagrada.. .. .. .. .. .. .. .. .. | 400 cc. |
| Tincture of orange.. .. .. .. .. .. .. .. .. .. .. .. .. | 100 cc. |
| Alcohol (90%).. .. .. .. .. .. .. .. .. .. .. .. .. .. | 50 cc. |
| Cinnamon water.. .. .. .. .. .. .. .. .. .. .. .. .. .. | 150 cc. |
| Syrup sufficient to produce.. .. .. .. .. .. .. .. .. .. | 1,000 cc. |

The syrup referred to is stipulated to be made from refined sugar and water. 1,000 grammes of sugar made up to a weight of 1,500 grammes. This gives a specific gravity of 1·330.

The B. P. Codex, 1911, mentions seventeen extracts and compounds in which cascara may be employed. Four of these are compound tablets or pills. The rest are liquid, fluid, or aromatic extracts or mixtures. They may contain in general any combination of aromatic oils, tinctures, licorice, glycerin, alcohol, alkalis, ammonia or chloroform water.

In order to destroy the natural bitter taste of the cascara, lime, magnesia, potassium hydroxide, ammonia and zinc oxide have been used with some success during percolation. Penschuck Chem. Abst, 1915, states, that for the purpose of debittering, sodium and ammonium salts are better than calcium or magnesium on account of the solubility of the products formed. Chloroform water may be added to prevent active fermentation. The use of alkalis follows from the incompatibility of extracts of cascara with acids or strong solutions of mineral salts.

## PREPARATION OF CASCARA SAGRADA DEFINED IN U. S. P.

Cascara sagrada is defined as "The dried bark of the trunk and branches of *Rhamnus purshiana* De Candolle (fam. Rhamnaceae)."

Four official preparations are mentioned. These are, extract, the powdered extract, the fluid extract, and the aromatic fluid extract. The last two alone will be described here.

1. Fluid extract of cascara sagrada U. S. P., 1910:—

| | |
|---|---|
| Cascara Sagrada in No. 40 powder | 1,000 grammes. |
| Alcohol | 250 cc. |

It is stated that the percolation should be carried out in the following manner. Type process D., p. 176, U. S. P., 1910. "To 1,000 grammes of the ground drug add 5,000cc. of boiling water, mix thoroughly, allow it to macerate in a covered container in a warm place for two hours. Then transfer the moist drug to a tinned or enamelled percolator, and allow percolation to proceed, gradually adding boiling water until the drug is exhausted. Evaporate the percolate on a water bath to the volume specified and when cold add the alcohol directed and mix thoroughly." From 1,000 grammes of drug 1,000cc. of fluid extract are made by the method quoted.

2. Aromatic Fluid extract of cascara (official), U.S.P., 1910, p. 180, contains the following:—

| | |
|---|---|
| Cascara Sagrada No. 40 powder | 1,000 grammes |
| Magnesium oxide | 125 " |
| Pure Extract of Glycyrrhiza (licorice) | 10 " |
| Glycerin | 200 ccs. |
| Alcohol | 250 " |
| Benzosulphimide | 1 gramme. |
| Oil of cinnamon | 0·2 ccs. |
| Oil of anise | 2·5 " |
| Oil of coriander | 0·1 " |
| Methyl salicylate | 0·2 " |
| Boiling water sufficient to produce | 1,000 " |

The cascara sagrada is thoroughly mixed with the magnesium oxide and moistened with 2,000cc. of boiling water. It is allowed to stand for two hours with stirring and then placed in a percolator. Boiling water is poured on the drug until exhausted and the percolate evaporated to 500cc. and while yet warm, the licorice is dissolved in it. When cold the glycerin is added and then the alcohol in which the benzosulphimide and oils have been dissolved. Finally sufficient water to make the required volume of 1,000cc. is added.

The French Pharmacopœia adds nothing new to the above and the literature bearing on the analytical constants to be expected from the analysis of such mixtures is very scanty, and covers at most the examination of a very few samples, none of which were either prepared or sold in this country.

Cascara sagrada (sacred bark) is the bark of a Western American tree, *Rhamnus purshiana*. It was discovered in 1806. In 1877 it was raised from the status of an Indian preparation to one used by the medical profession by Dr. J. H. Bundy. It was in 1878 that the Parke Davis Company, Detroit, Mich., first placed a fluid extract on the market. The next year it was introduced into Europe by the British Medical Association. In 1911 it was estimated that one million pounds of this bark were being used annually. Up to the present no cultivation of the tree has been carried beyond the experimental stage. Any increase in the price has been sufficient inducement for the more extensive gathering of the natural bark.

It is impossible to review here all the work that has been done on the botanical and chemical nature of this bark and the group to which it belongs. Only a few general and indispensable points will be considered and a few of the better references

given. The complexity of the chemistry involved in a study of the active constituents and bitter principles of such drugs has been so great that their actual identification has not yet been established. Prescott, Amer. Jour. of Pharm., vol. 51, 1879, p. 165, working on the bark isolated, certain resins, tannic acid, oxalic and malic acid, certain oils, and wax. The presence of emodin in this bark is noted by Limousin Jour. de Pharm. et de Chim., vol. 6, 1885, p. 80, and Jowett, Proc. Amer. Pharm. Assoc., vol. 52, 1904, p. 288, isolated certain isomers of emodin as well as arachidic acid and a hydrolytic enzyme. Mossler, Pharm. Post, 1913, vol. 46, p. 313, dealing with emodin-bearing drugs, rhubarb, cascara, senna and aloes obtains crystals, after suitable extraction, which are seen to be specific for the first three under polarized light. The chemistry of cascara is inseparable from that of other drugs of the same class, namely, the emodin-bearing drugs aloes, rhubarb, and senna. As these are at any time likely, from their properties to be in admixture the analyst must as far as he is able apply qualitative tests for their distinction when dealing with any one of them unless he knows absolutely the previous history of the sample. Besides those mentioned we have *Rhamnus frangula* (buckthorn) which is more like *Rhamnus purshiana* (cascara) than any of the others..

This class of drugs may be best tested for by the Borntträger reaction for emodin. The nature of this test and other colour tests will be given later. Neither the bitter nor the total laxative properties of these drugs are due to this constituent. Emodin is a trioxymethylanthraquinone. It is a hydrolytic decomposition product of glucosides in the bark. Although the active constituents of these drugs are not known, it may be said that they are not alkaloids.

The genuine *Rhamnus purshiana* is most likely to be confused with the members of the same family, *Rhamnus frangula* and *Rhamnus californica*. *Rhamnus frangula* is imported into this country from Europe. *Rhamnus californica* grows in greater abundance in the southwestern States than it does in the north. There are sufficient points of difference to render their identification fairly easy under the microscope or by colour test and extracts. No legitimate excuse could there be made for their indiscriminate use. Other barks have been found present in shipments of *Rhamnus purshiana*. Among them are to be mentioned Western Wild Cherry, and *Cornus nutelli* (Western Flowering Dogwood). A large volume of work has accumulated with reference to the barks themselves and their microscopy. The best bibliography of this work up to 1914 is given by Johnson and Hindman, Amer. Jour. Pharm., 1914, p. 387. Here a history of the drug and the articles of reference on *Rhamnus purshiana* may be found.

Considerable work has been done from the viewpoint of the analyst who is called upon to distinguish cascara in admixture. Emodin may be detected in the presence of phenolphthalein, as is shown by Warren, Amer. Jour. Pharm., Oct., 1914, p. 444. Tichborne, British Year Book of Pharm., 1901, p. 439, gives an account of his examination of 29 samples of liquid extract of cascara; 9 were adulterated. This opinion was based on the drying or non-drying qualities of the extract and the amount of reducing sugars present.

## ANALYTICAL DETERMINATIONS AND NATURE OF WORK REPORTED.

After due consideration of the possible data which might be derived from work on these samples, it was decided that the basis of our report should be made to include the following determinations. The headings which are to follow will be discussed one by one and reasons set forth for their adoption. Wherever possible analytical results will be discussed from the viewpoint of standards. Tables showing ranges and averages will be given along with the method of procedure in outline.

## 1. SPECIFIC GRAVITY.

By this determination alone a close line may be drawn between those samples which are likely to prove to be aromatic and those likely to be found liquid or fluid extracts of cascara. Determinations were made directly at room temperature (20 deg. C.) by means of a set of hydrometers. The following table deals with 130 samples and bears no relation to what these samples were sold as, but is based on what their examination proved them to be. Three tables forming a natural division of the whole number are given:—

TABLE 1.

| 1. Aromatic Extracts of Cascara. | | 2. Preparations not "official" sold under various labels. Some sold as Fluid Ex. Cas. Sag. | | 3. Fluid Extract of Cascara. | |
|---|---|---|---|---|---|
| Range of sp. gr. | Samples in range. | Range of sp. gr. | Samples in range. | Range of sp. gr. | Samples in range. |
| 1.00 to 1.10 | None. | 1.00 to 1.10 | 5 | 1.00 to 1.03 | 0 |
| | | 1.10 to 1.15 | 0 | 1.03 to 1.04 | 1 |
| 1.10 to 1.15 | 3 | 1.15 to 1.20 | 11 | 1.04 to 1.05 | 3 |
| 1.15 to 1.20 | 8 | 1.20 to 1.25 | 2 | 1.05 to 1.06 | 12 |
| 1.20 to 1.25 | 3 | 1.25 to 1.30 | 0 | 1.06 to 1.07 | 29 |
| 1.25 to 1.30 | 4 | 1.30 to 1.35 | 0 | 1.07 to 1.08 | 40 |
| | Total 18 | 1.35 to 1.40 | 1 | 1.08 to 1.09 | 4 |
| | | | Total 19 | 1.09 to 1.10 | 4 |
| | | | | | Total 130 |

*Group one* contains licorice, glycerin and aromatics.

*Group two* contains trade preparations, glycerinated cascaras without licorice or aromatics.

*Group three* contains preparations presumed to be Fluid Extracts of Cascara.

It is to be noted here that Squire's Companion to B.P. p. 410, 1916 gives the specific gravity of Liquid Extracts as 1·060. It would appear from our work that a suitable range would be from 1·05 to 1·08. Samples below this range proved to be diluted extracts by other determinations, and samples above this range contain more solids than it is normally possible to extract by official methods of percolation.

## 2. ALCOHOL.

It has been calculated that B.P. Fluid Etracts of Cascara Sagrada should contain 22·5 per cent ethyl alcohol by volume. This is based o nthe ground that the 250cc. of 90 per cent alcohol required is equivalent to 225cc. of absolute alcohol.

By similar methods, and by reference to requirements it may be shown that:—

B.P. Syr. Cas. Sag. should contain 13·5% alcohol by volume.
U.S.P. Fl. Cas. Sag. should contain 24% alcohol by volume.
U.S.P. Aromatic Cas. Sag. should contain 24% alcohol by volume.

From an inspection of the above and from consideration of tables it may be seen to what extent these conditions have been met with by samples under consideration. These tables refer to the same classification as was given under previous heading.

TABLE 2.

| Group 1. Range of alcohol. | Samples. | Group 2. Range of alcohol. | Samples. | Group 3. Range of alcohol. | Samples. |
|---|---|---|---|---|---|
| 0 to 1% | 4 | 0 to 1% | 3 | 3 to 4% | 1 |
| 1 " 2 | 5 | 1 " 2 | 8 | 10 " 11 | 1 |
| 2 " 3 | 2 | 2 " 11 | 0 | 13 " 14 | 1 |
| 3 " 4 | 1 | 11 " 12 | 2 | 14 " 15 | 5 |
| 4 " 5 | 0 | 12 " 13 | 0 | 15 " 16 | 2 |
| 5 " 6 | 1 | 13 " 14 | 2 | 16 " 17 | 16 |
| 6 " 9 | 0 | 14 " 17 | 0 | 17 " 18 | 14 |
| 9 " 10 | 1 | 17 " 18 | 1 | 18 " 19 | 2 |
| 10 " 14 | 0 | 18 " 21 | 0 | 19 " 20 | 13 |
| 14 " 15 | 2 | 21 " 22 | 2 | 20 " 21 | 11 |
| 15 " 16 | 1 | | Total 18 | 21 " 22 | 5 |
| 16 " 19 | 0 | | | 22 " 23 | 8 |
| 19 " 20 | 1 | | | 23 " 24 | 9 |
| | Total 18 | | | 24 " 25 | 1 |
| | | | | 25 " 26 | 1 |
| | | | | 26 " 27 | 1 |
| | | | | 27 " 28 | 1 |
| | | | | 28 " 29 | 2 |
| | | | | 29 " 30 | 1 |
| | | | | 30 " 31 | 1 |
| | | | | | Total 96 |

Very few samples comply strictly with the alcohol requirements. The presence of the required amounts of both alcohol and glycerin in Aromatic samples is very rare and the majority of fluid extracts range a few per cent low. The extracts of lower alcoholic strength give an increased sedimentation on standing. Glycerin when present in sufficient quantity gives a permanent solution of solids which would otherwise settle out on dilution with water.

## 3. TOTAL SOLIDS.

TABLE 3.

| Group 1. Total Solids. | Samples. | Group 2. Total Solids. | Samples. | Group 3. Total Solids. | Samples. |
|---|---|---|---|---|---|
| 40 to 50% | 5 | 15 to 20% | 1 | Below 18% | 6 |
| 50 " 60 | 4 | 20 " 25 | 3 | 18 to 20 | 2 |
| 60 " 70 | 3 | 25 " 35 | 1 | 20 " 25 | 27 |
| 70 " 80 | 4 | 35 " 45 | 0 | 25 " 30 | 45 |
| 80 " 90 | 2 | 45 " 50 | 2 | 30 " 35 | 16 |
| | | 50 " 60 | 2 | | |
| | | 60 " 70 | 8 | | |
| | | 70 " 95 | 2 | | |
| | Total 18 | | Total 19 | | Total 96 |

Here a marked difference is shown between the aromatic and near aromatic, and the liquid extracts. This is due to the presence of licorice, glycerine or sugar. Perhaps the total solids show better than any other single determination the inconstancy of the composition of aromatic extracts and trade preparations. Squire's would allow a range of from 17 to 27 per cent solids W/V. This is a very wide range yet it does not seem wide enough to contain all the samples sold as Liquid Extracts. Parke, Davis

and Co. in a private communication suplied us with data relative to the possibility of obtaining a uniform extract from cascara bark. Out of 24 lots of this drug, working on a commercial basis, the extractive matter never once fell below 18·8 per cent and exceeded 22 per cent in only one instance. This particular sample ran up to 26·6 per cent. They were using the official U.S.P. method of percolation. From such evidence it would appear that there is no valid reason why the total solids of a genuine extract of cascara made according to any official preparation should not remain uniform, from time to time. It seems quite evident then that the range for extracts sold as official liquid or fluid extracts might reasonably be established temporarily as ranging from 17 to 27 per cent. It may be seen from the general table or from group 3 of this section that a large number sold at present would be cut out under such a ruling.

The problem of setting standards for total solids is made more complicated when it is considered that even while using official methods of percolation results obtained may differ. Our own work shows this. By the method of extraction employed by the B.P. we obtained on two samples of genuine cascara bark an extract whose total solid content ran 21·79 and 21·03 per cent. While working on this same bark and using the U.S.P. method of percolation we obtained 30·50 and 31·48 per cent solids. In order to wash out the last traces of colour we used 1800cc. of water in portions of 75cc. (boiling). The official U.S.P. method requires the washing to be sufficient to give a clear filtrate coming through. It does not specify the amount or the portions in which this amount is to be used. We were working on 50 gram samples of No. 40 powdered bark. These factors that are not mentioned are important in obtaining uniform results. It must then be admitted that such methods as are given in pharmacopoeias are of little value as they now stand as a basis for standards. Much greater detail is necessary before uniformity should be looked for in the products of different firms. Such results as quoted above from Parke, Davis & Co., simply go to show that they work in a uniform manner. Others using different detail might easily obtain uniform results several per cent higher, and yet would be using the official method.

The exposure of a few drops of cascara extract on a porcelain plate serves as a very simple and useful test of the nature of any cascara extract. A genuine liquid extract will dry up in a short time to a hard varnish. If the extract contains licorice or glycerin it will not dry even after long exposure over days or weeks. A diluted extract of cascara will not readily dry out to a hard glassy varnish. It forms a sticky semi-crystalline mass, which does not lose this property for several days. This may be due to the fact that on dilution the resins will precipitate out first, and if they are already partly gone the remaining solution is unable to form the same natural varnish that the genuine extract does. There would also seem to be a definite relation between this drying property and the reducing sugar content. A normal liquid extract of cascara contains not less than 5·75 per cent of reducing sugars calculated as glucose. If the sugar content is above this limit it will quickly dry to a glassy varnish. If the reducing sugar content is below this it will not quickly dry but remains a sticky mass on the plate. All aromatic extracts studied were found to be non-drying due to their glycerin content.

The total solids were determined as W/V. 10cc. were dried in platinum at 110 deg. C., to a constant weight. Those samples containing glycerin make results of this nature hard to control to very narrow limits, for the reason that at this temperature there is some loss of the glycerin in the steam.

## 4. SOLIDS PRECIPITATED ON DILUTION.

An aromatic extract containing glycerin or licorice will keep in solution all its solids on dilution with water. On the other hand a liquid extract whose solids are

retained in solution by virtue of its alcohol content will when diluted give a measurable precipitation. If the solution has the proper content of alcohol, but is lacking in cascara bark extractive, this deficiency is made evident by the small precipitation on dilution. It may be noted here that concentrated extract of cascara is insoluble to a large measure in 90 per cent alcohol. As this alcohol is diluted these solids go into solution but on excessive dilution where the alcohol content drops to 10 per cent or lower a marked settling out of the solids occurs. The dilution was made by dropping 5cc. of the extract into 95cc. of water and filtering off the solids formed.

TABLE 4.

Group 1.—No precipitation on dilution observed in any sample.

Group 2.—No precipitation on dilution observed in 12 samples. Two samples showed some precipitation up to 2 per cent.

Group 3.—No precipitation on dilution observed in one sample only.

This sample contained only 3 per cent alcohol and no precipitation was to be expected.

| Percentage W/V of Solids precipitated on dilution. | Samples. |
|---|---|
| 0·50 to 1·0 per cent. . . . . | 5 |
| 1·00 " 1·50 " . . . . . | 11 |
| 1·50 " 2·00 " . . . . . | 13 |
| 2·00 " 2·50 " . . . . . | 12 |
| 2·50 " 3·00 " . . . . . | 5 |
| 3·00 " 3·50 " . . . . . | 4 |
| 3·50 " 4·50 " . . . . . | 2 |
| Total . . . . . | 52 |

It is evident here that the extreme limits for apparently genuine extracts would be from 1·00 per cent to 4·50 per cent. It might be more advisable to place a lower limit on at 1·5 per cent.

## 5. REDUCING SUGARS.

Reducing sugars, as glucose, were estimated on 76 samples. There is a variation shown and it is evident that there is a normal content for genuine liquid extracts of cascara. This runs from 5·25 to 7·75 per cent. Aromatic extracts are always much lower and run from 1 to 3 per cent. The amount of sugar formed in a normal liquid extract by acid hydrolysis does not exceed 3 per cent. If more than this amount is present it is evidence of added sucrose.

TABLE 5.

| Group 1. | | Group 2. | | Group 3. | |
|---|---|---|---|---|---|
| Reducing Sugar. | Samples. | Reducing Sugar. | Samples. | Reducing Sugar. | Samples. |
| 0 to 1% | 1 | 0 to 1% | 0 | 0 to 4% | 2 |
| 1 " 2 | 3 | 1 " 2 | 2 | 4 " 5 | 7 |
| 2 " 3 | 3 | 2 " 3 | 2 | 5 " 6 | 6 |
| 3 " 4 | 1 | 3 " 4 | 3 | 6 " 7 | 17 |
| | Total 8 | 4 " 5 | 1 | 7 " 8 | 10 |
| Less than 5% | 8 | 5 " 6 | 0 | 8 " 9 | 7 |
| Greater than 5% | 0 | 6 " 7 | 2 | 9 " 10 | 1 |
| | | 7 " 8 | 1 | 10 " 11 | 4 |
| | | 8 " 9 | 2 | | Total 54 |
| | | 9 " 10 | 2 | | |
| | | | Total 15 | | |
| | | Less than 5% | 8 | Less than 5% | 9 |
| | | Greater than 5% | 7 | Greater than 5% | 45 |

These groupo are the same as aro referred to on page 8 and it will be seen that those samples running ahove 7·5 per cent redueing sugars in group 3 are all samples with abnormally high solids.

## 6. LICORICE, GLYCERIN, AROMATICS.

Theso substances are used to disguiso the bitter taste of the cascara. No quantitative work was done except in the caso of glyeerin. The exact determination of glyeerin in such admixture presents eonsiderable difficulty. An approximation was arrived at by the method of boiling off in steam; 10 cc. of the aromatic extract was slowly heated to 160° C., and by the addition of smal quantities of water from time to time the glyeerin was boiled off. The glyeerin was estimated to be the differenee between the solids remaining at this temperature and those remaining after one drying at 110° C.

A certain increase in weight oeeurs due to the slow oxidation at this temperature. It is also very likely that some glyeerin beeomes non-volatile during the process. The sum-total of these errors, however, as determined through such suitable blanks as could be devised, is not great enough to destroy the usefulness of the method. The chief error arises from oxidation of the solids during the process. This may amount to a 2 percent inerease W/V of the total solids preeent, after eight hours at 160° C. A mixture of pure glyeerin and a genuine easeara showed that practieally all the glyeerin eould be driven off in this way.

It may be ealculated that there should be about 25 per eent glyeerin present W V in a U.S.P. aromatie extract. Out of seventeen samples, examined twelve of whieh belonged to group 2, eight were found to be below 25 per eent.

No attempt was made to identify any of the aromatie substanees used. They are preseut in very small quantities and are quite harmless.

## 7. ASH.

The value of an ash determination beeomes evident from a eonsideration of its variation. If some attempt has been made to dehitter the extraet by applieation of lime, soda, ammonium salts, or magnesia, it is possible, that through eontamination or solution these may greatly inerease the ash in amount. Such was found to be the ease. The colour of the ash, when heated strongly in a muffle is also a good indieation of the nature of the sample. The ash from an aromatie extraet eontaining glyeerin and liearice will be greyish white. The ash from samples eontaining exeess of lime salts will be pure white. The ash of genuine samples will be some shade of green depending on the amount of manganite salts preseut. This manganese eomes from the bark and is sufficiently soluble in the water extraet to be found in this way in the ash. The ealeium in the ash is not a eonstituent which might come from percolation of the bark and the solution of ealeium salts. These salts are not removed to any extent by boiling the bark in water, and are evidently present in the bark as oxalate and carbonate. A table of the ash values follows. It will be seen that in classes 1 and 2, which are aromatie and nondeseript samples, the range is very wide. In group 3, however, where the liquid and fluid extracts are tabulated, the range is seen to be within more reasonable limits.

The ash varies as the solids extracted. For a sample extracted by B.P. method giving 21 per eent solids the ash was 0·96 per eent, and for sample extracted by U.S.P. method giving 30 per eent solids the ash was 1·08 per eent. In both cases the ash was a beautiful green colour.

Tables dealing with the ash of seventy-seven samples:—

TABLE 6.

| Group 1. | | Group 2. | | Group 3. | |
|---|---|---|---|---|---|
| 1 to 1·5% | 1 | Below 1 % | 1 | 0·0 to 0·5% | 1 |
| 1·5 „ 2·0 | 1 | 1 to 1·5 | 0 | 0·5 „ 1·0 | 33 |
| 2·0 „ 2·5 | 1 | 1·5 „ 2·0 | 7 | 1·0 „ 1·5 | 18 |
| 2·5 „ 3·5 | 0 | 2· „ 2·5 | 2 | 1·5 „ 2·0 | 5 |
| 3·5 „ 4·0 | 4 | 2·5 „ 3·0 | 0 | 2·0 „ 2·5 | 1 |
| 4·0 „ 5·0 | 0 | 3· „ 3·5 | 1 | 3·0 „ 4·0 | 1 |
| 5·0 „ 5·5 | 1 | 3·5 „ 4·0 | 4 | | |
| | | 4·0 „ 4·5 | 1 | | |
| Total | 8 | Total | 10 | Total | 59 |

It would seem from our experience that a range of from 0·7 to 1·1 per cent for the ash of genuine liquid extracts of cascara would not be unjust. Any extracts either above or below these limits were found to be abnormal in some respect.

## 8. MANGANESE NUMBER.

An attempt is here made to take advantage of the fact that the bark of *Rhamnus purshiana* contains a relatively large quantity of manganeso which is solublo by the method of percolation. As stated above, the manganese gives a green colour to the ash. The general usefulness of this determination depends on the fact that the manganese content of this bark is greatly in excess of that of any other laxative drug, except *Rhamnus frangula*. This drug is one that is imported and its cost is such that it is not likely to become an adulterant of *Rhamnus purshiana*. In the majority of liquid extracts, then, where cascara is the only drug extractive present a determination of the manganese content of the ash becomes a semi-quantitative measure of the actual amount of cascara extractive present. Before trusting to such data it is necessary to show that the manganese content of cascara is fairly uniform or at least define its limits. To this end various samples of this bark were obtained and in particular guaranteed samples were kindly supplied by Parke Davis & Company. The percentage of manganese in the bark depends on its thickness. In general the inside shows a much higher content than the outside and the thinner bark shows a higher percentage than the thicker. From an examination of selected bark it was determined that on an air-dry basis the lower limit for thick bark is around 0·0093 per cent Mn. and the upper limit 0·015 p.c. Mn. No doubt selected bark might run below and above these limits. For the purpose of this work where the manganese is used as a standard the lower limit is the more important, and it is safe to say that the most or greater part of the bark coming on the market easily reaches this standard. For our purposes it was necessary to show that the methods of percolation extracted this manganese in a uniform manner. It was found that for a definite method of percolation, the manganese was extracted in proportion to its total amount in the bark. Thus it was found that a bark whose original manganese content was 0·099 per cent gave in its extract 0·0023 p.c. Mn. when the B.P. method of percolation was used. This same bark when extracted by the U.S.P. method gave as previously stated 30 per cent solids and 0·0028 p.c. Mn. The manganese is extracted proportionally to the solids and about one-quarter of the total manganese is available in the extract from cascara bark. These are lower limits as more than these amounts were found in many samples. These may be taken as the minimum amounts that should be present provided genuine cascara bark has been used and no dilution of the extract has taken place. For a liquid extract one cc. is the equivalent of one gram of the bark. Thus, providing

the method of extraction is known, the percentage of manganese W/V of the extract is in direct proportion to the percentage extracted. Since the percentage extracted is uniform for a given method, this number should be a direct measure of the bark equivalent of the extract. Thus we have developed what may be defined as a MANGANESE NUMBER. This is the per cent W/V of manganese × 100,000. It is necessary for us to place our lower limit at 0·0023 per cent, as all official methods may not give the same result if the detail varies. The amount of manganese extracted from cascara bark should be approximately proportional to the solids extracted. That is the per ceut of manganese in the total solids of a genuine extract should be approximately constant, provided the method of extraction is uniform. Considering all our results where extraction may not have been uniform, this number ranges from 0·01 to 0·025 for samples deemed genuine. If this number falls below this, it is evident that the solids of this extract are not all cascara solids. This test is of value in distinguishing extracts of *Rhamnus californica* and *Rhamnus purshiana*. Only one sample of *Rhamnus californica* was available. This was mature bark of the same order of thickness as the cascara giving us our lower limits. Its total manganese content was 0·0027 per cent. This gives a correspondingly low extractive of 0·0008 per cent. It is thus apparent that an extract from this bark would have a much lower manganese number than an extract from *Rhamnus purshiana*. Whether or not some of the extracts examined which show low manganese numbers have been prepared from this bark is a matter of inference. Examination of *Rhamnus frangula* proved that the bark contained on the average about three times as much manganese as *Rhamnus purshiana* and extracted about four times as much by the same procedure. For mature bark 0·0248 per cent Mn. was found present. For one sample of thinner bark 0·0626 per cent Mn. was determined. This in itself is quite remarkable as it is by far the highest per cent of manganese so far determined in any organic substances of this nature from data available. All these calculations are made on air-dry samples whose moisture content ran from 7 to 7·5 per cent.

Before coming to the application of this determination and its value in a study of aromatic extracts, it is necessary to discuss the manganese content of licorice root, and the more common laxative drugs such as senna, rhubarb, aloes and wahoo bark. Work was done on these similar to that above. The total manganese content of senna leaves was 0·0040 per cent, rhubarb 0·0034 per cent, licorice root 0·0025 per cent, wahoo bark 0·0020 per cent, and barbadoes aloes 0·0006 per cent. The licorice and the senna are the only two that will be mentioned. Licorice occurs in nearly all aromatic preparations and senna is often sold in admixture with cascara. Water extracts of these showed very small amounts of manganese to be extracted. It is thus seen that when these drugs displace cascara the manganese content will be very much lowered. On the other hand if they are present in addition to the cascara extract the total manganese content would only be slightly raised by their presence and the percentage of total manganese based on total solids would be much below that of a genuine extract. Thus even while considering aromatic extracts it is safe to say that their manganese content varies directly with their cascara content.

It was found best to work on 10cc. of the extract, or on 10 grammes of the bark. The ammonium persulphate method with silver salt as catalyser was used. The sample was completely ashed and taken up directly with about 15cc. of concentrated sulphuric acid in platinum. This was heated till the acid fumed freely. This was then washed either into a beaker or a volumetric flask.

If the ashing has not been complete this solution may be filtered on dilution and again ashed. For small amounts up to 0·004 per cent manganese good work may be accomplished by using a volumetric flask of 100cc. capacity. The colour obtained on this dilution may be compared with that of standard permanganate solution made up as nearly as possible like the solution to be tested with special regard for duplicate acid concentrations. For percentages higher than this, and using a 10 gramme sample the colour will be so deep that a larger volume of solution must be used. Unless the solution is sufficiently dilute a hydrated form of manganese will precipitate out. For

a 10 gramme sample running 0·02 per cent manganese a dilution of at least 400cc. is necessary in order to avoid the formation of the hydrated form on the addition of the ammonium persulphate. One cc. of silver nitrate solution made from 5 grammes of this salt per 100cc. was added as a catalyser. The solution was then warmed to about 80° C., and a gramme of ammonium persulphate was added. The solution was then allowed to stand on a steam bath. The colour did not always come at the same rate but it was certainly complete at the end of one hour. It was then cooled and titrated with standard sodium arsenite solution or if sample contained low percentages of manganese it was compared colorometrically. We were able to check results working both ways or either way.

A table follows in which the manganese numbers are given as defined above. Seventy-six samples were tested in this manner.

TABLE 7.

| Group 1. | | Group 2. | | Group 3. | |
|---|---|---|---|---|---|
| Range of Manganese. | Samples. | Range of Manganese. | Samples. | Range of Manganese. | Samples. |
| 0 to 50 | 3 | 0 to 50 | 5 | 0 to 100 | 0 |
| 50 „ 100 | 1 | 50 „ 100 | 1 | 100 „ 150 | 6 |
| 100 „ 150 | 1 | 100 „ 150 | 0 | 150 „ 200 | 6 |
| 150 „ 200 | 2 | 150 „ 200 | 3 | 200 „ 250 | 7 |
| 200 „ 400 | 0 | 200 „ 250 | 2 | 250 „ 300 | 10 |
| 400 „ 450 | 1 | 250 „ 400 | 0 | 300 „ 350 | 6 |
| | | 400 „ 450 | 1 | 350 „ 400 | 3 |
| | | 450 „ 600 | 2 | 400 „ 500 | 13 |
| | | 600 „ 700 | 1 | 500 „ 600 | 1 |
| | | | | 600 „ 700 | 1 |
| | Total 8 | | Total 15 | | Total 53 |

From this it will be seen that a large number of aromatic extracts and trade preparations are exceedingly low in cascara extract. It may be doubted if some of them contain even more than a trace. The fluid extracts appear at their true advantage under this test. It is to be noted that an aromatic extract properly prepared does reveal its cascara content by this test. The higher numbers in groups one and two show this.

## 9. COLOUR REACTIONS AND TESTS.

The Bornträger reaction is most general for emodin-bearing drugs. If the aqueous extract is acidulated and extracted with benzol and the extract washed with water a red colouration will appear in the aqueous layer when this is made alkaline. This test holds good in the presence of emodin or other anthraquinone compounds. Cascara will respond to the test in greater dilution than any of the other drugs that come in this class. Senna fails to always respond to this test in a satisfactory manner and no conclusive evidence of its presence is to be gained in this way. Its presence, however, does not destroy the test when the slightest trace of cascara is present. Phenolphthalein of course will mask these tests. It may be removed by the method of Warren Amer. J. Pharm. 86, 1914, p. 444. This procedure could not be applied to so many samples where its presence was not even suspected. There is a difference in the colour given by cascara alone, and phenolphthalein alone, that may be distinguished. The cascara is a deeper red and is more the colour of methyl orange. Even in admixture there is a difference in the colour which is quite distinct from that given by either of the substances alone. Moreover the phenolphtalein colour

fades when the solution is made strongly alkaline and allowed to stand. In this way all samples were tested and compared with standards and in no case was any evidence of the presence of phenolphthalein observed. It was found impossible to detect other emodin-bearing drugs in the presence of such large quantities of cascara. All colour reactions where alkaline salts are used as a basis and where the formation of rings of different shades is depended upon were found untrustworthy. In every case the cascara masked such faint differences as are to be noted when comparing genuine individual extracts. A pure extract of rhubarb will give on ether extraction a blue colouration when brought in contact with solution of ferrous sulphate. When one tries to follow this reaction in the presence of 50 per cent cascara extract the difficulty is greatly increased because although cascara does not give the same shade of blue it does give a colouration which may be sufficiently dense to make the detection of rhubarb almost impossible. It is thus quite evident that small percentages of emodin-bearing drugs are much more likely to be missed than they are to be positively identified when present in small and unknown admixture with cascara. Hubbard reviews (Jour. Ind. and Eng. Chem., 1917, p. 518) the generally known colour reactions for these drugs. He concludes that senna is the most difficult to detect. In the presence of ammonium thiocyanate the ether extract of senna is said to give a yellow to brownish colour, also with ammonium molybdate. We were unable to obtain these colourations and in each case observed no colour change. A good method for the detection of senna would be of great assistance in the examination of cascara mixtures as this drug is the one most likely to be found in admixture in many trade preparations of cascara. The absolute detection of aloes has been probably better worked out than any of the others. Mossler, Pharm. Post, 46, 1917, p. 313, claims the ability to detect 0·2 g. of aloes in 5 grammes of rhubarb or cascara. The fluorescence test for aloes in the presence of cascara, using borax solution with the ether extract, is certainly not delicate enough to be of much value when the cascara is in any great excess. In general it may be said, that the extracts of these drugs give a red colouration in solutions where the hydroxyl ion is present in excess. In the Bornträger reaction ammonia is used directly. Borax solution amounts to practically the same thing since it gives an alkaline solution through hydrolysis. Chlorinated lime is in the same class. Any alkaline salt will give the same red colouration that is obtained by ammonia in the Bornträger reaction and neutral or acid salts will not give it. Shades or differences in colouration may be due to the presence of various cations in such a variety of salts. The depth of colour produced by equivalent amounts of cascara, aloes, rhubarb and senna, ranges from strong to weak in the order named above.

The Borntrager reaction was carried out on seventy-six samples. In one case the emodin reaction was distinctly negative. In fourteen samples the reaction was very faint. This shows the presence of only traces of cascara at best. All these fifteen samples come in groups 1 and 2.

Although adulteration of these extracts by other drugs was not particularly suspected, tests were attempted on a number of samples for the presence of aloes and rhubarb by means of the borax test and ferrous sulphate. In no case were these tests deemed to be positive although they cannot be taken as absolutely conclusive. Some samples were declared to contain senna. We were unable to positively identify the presence of this drug.

It must be stated once again here that we have not tried to classify these samples in this part of our report strictly according to the way they were sold to our inspectors. The general public cannot be expected to appreciate the difference between aromatic and fluid extracts of cascara. Although the simple name Cascara Sagrada refers strictly speaking to a bark and not to any particular extract, yet a large number of extracts were sold simply as "Cascara Sagrada." This implies nothing on their

part as to the nature of their composition. This may in one sense be considered a case of misbranding. It really is the outcome of the public's attempt to prescribe for itself in semi-intelligent terms. As a rule the manufacturer has taken advantage of the possibilities in the manufacture of aromatic extracts. Licorice and glycerin are found to have unduly displaced the cascara extract that should be present in these samples. These extracts are also unofficial in that they do not contain the required alcohol content.

The liquid and fluid extracts are much nearer official standards, and their intrinsic value as laxatives is, on the average, much greater.

L. E. WESTMAN,
R. M. ROWAT,
*Public Analysts.*

| 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 NOVA SCOTIA—R. J. WAUGH, INSPECTOR.** | | | | | | | |
| 1917 | | | | | | | |
| July 18 | Cascara Sagrada | 76611 | McLeod & Balcom, Halifax. | 12 ozs. | 1.35 | Burroughs Wellcome, Co., London, Eng. | Mfr. |
| " 18 | " | 76612 | Buckleys, Ltd. " | 12 " | 1.35 | " " | " |
| " 20 | " | 76613 | National Drug & Chem. Co. Halifax. | 12 " | 1.26 | Vendors | |
| " 20 | " | 76614 | " " | 12 " | 1.80 | Parke Davis & Co. Walkerville. | Mfr. |
| Aug. 7 | " | 53773 | Carew & Fraser, New Glasgow, N. S. | 12 " | 1.35 | Burroughs Wellcome, London, Eng. | " |
| " 9 | " | 53774 | T. H. Cochrane, New Glasgow, N. S. | 12 " | 1.00 | Nat. Drug Co., Montreal. | " |
| " 9 | " | 53775 | A. C. B H, New Glasgow, N. S. | 12 " | 1.50 | " " | " |
| **DISTRICT OF CAPE BRETON—** | | | | | | | |
| Aug. 23 | Cascara Sag. Liq | 63884 | J. J. Turnbull, Sydney, N.S. | 12 ozs. | 1.35 | Nat. Drug Co. | |
| **DISTRICT OF NEW BRUNSWICK—** | | | | | | | |
| June 26 | Liq. Extract Cascara Sagrada. | 78031 | Nat. Drug & Chem. Co., St. John, N. B. | 1 Bo. | 3.12 | Parke Davis Co., Walkerville. | |
| July 3 | " | 78032 | E. Clinton Brown, St. John, N. B. | 12 oz. | 1.80 | John Wyeth & Bros., Philadelphia. | Lymans Ltd., Montreal. |
| " 4 | " | 78033 | A. Chipman Smith & Co., St. John, N. B. | 12 " | 1.50 | Burroughs Wellcome & Co. London, Eng. | |
| " 4 | " | 78034 | Moore's Drug Store, St. John N. B. | 12 " | 1.59 | " " | |
| " 9 | Liq. Extract Cascara Sag. Comp. | 78035 | Geo. Comps, Druggist, St. John, N. B. | 12 " | 1.00 | C. E. Frosst & Co., Montreal. | |
| " 26 | Liq. Extract Cascara Sagrada. | 78036 | Johnston & Johnston, St. Stephen, N. B. | 12 " | 1.50 | John Wyeth & Bros., Montreal. | |
| " 7 | " | 78037 | R. T. Mack, Fredericton, N. B. | 12 " | 1.95 | Nat. Drug & Chem. Co. | |
| " 11 | " | 78038 | Chapman & Morrell, Grand Falls, N. B. | 12 " | 1.25 | C. E. Frosst & Co., Montreal. | |
| " 24 | Liq. Extract Cascara Sagrada Aromatic. | 78039 | C. P. Hickey, Chatham, N.B. | 12 " | 1.20 | Nat. Drug & Chem. Co. | |
| " 25 | Liq. Extract Cascara Sagrada. | 78040 | E. J. Collins, Newcastle, N.B. | 12 " | 1.20 | C. E. Frosst & Co., Montreal. | |

## LIQUID EXTRACT CASCARA SAGRADA.

| Inspector's Report (is not an expression of opinion.) | Results of Analysis. | | | | No. of Sample. |
|---|---|---|---|---|---|
| | Sp. Gr. at 15·5° C. | Alcohol weight in Vol. | Total Solids. | — | |
| **W. PETIPAS, TEMPORARY INSPECTOR.** | | | | | |
| | 1·0676 | 17·08 | 27·29 | | 76611 |
| | 1·0677 | 17·16 | 27 15 | | 76612 |
| | 1·0561 | 16 56 | 22·30 | | 76613 |
| | 1·0781 | 16 56 | 29 14 | | 76611 |
| | 1·0723 | 17·92 | 28 18 | | 53773 |
| | 1·0587 | 16 32 | 23 66 | | 53771 |
| | 1 0409 | 10 88 | 15·20 | | 53775 |
| **E. F. MACKEEN, INSPECTOR.** | | | | | |
| | 1·0612 | 15·08 | 24·99 | | 63881 |
| **JOHN C. FERGUSON, INSPECTOR.** | | | | | |
| | 1 0773 | 16·84 | 28·81 | | 78031 |
| | 1·0183 | 11·28 | 15·46 | Wyeth's Special Compound. | 78032 |
| | 1 0674 | 17·48 | 27·25 | | 78033 |
| | 1 0673 | 17·48 | 27 66 | | 78034 |
| | 1·2695 | | 79·22 | Frosst's Aromatic sold as Compound | 78035 |
| | 1·0641 | 20·88 | 27·27 | | 78036 |
| | 1·0587 | 17·48 | 28·16 | | 78037 |
| | 1 0531 | 16 52 | 21 01 | | 78038 |
| | 1·2731 | | 72 34 | Nat. Drug. Aromatic. | 78039 |
| | 1 2630 | | 78·16 | Frosst's Aromatic. | 78040 |

| 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. | | Inspector's Report. (Is not an expression of opinion.) |
|---|---|---|---|---|---|---|---|---|
| | | | | Quantity. | Cents. | Manufacturer. | Furnisher. | |
| **DISTRICT OF QUEBEC CITY—** | | | | | | | | |
| 1917. | | | | | | | | |
| June 19 | Extrait de fluid Cascara Sagrada. | 71205 | J. A. Leclerc, 516 St. Jean, Quebec. | 3 ozs. | 1.00 | Parke Davis Co. | ..... | . . . . . |
| " 19 | " | 71206 | A. C. Francoeur, 394 St. Jean, Quebec. | 12 " | 1.20 | F. W. Horner, Montreal. | ..... | ..... .... |
| " 19 | " | 71207 | Alf. Jolicoeur, 3.8 St Jean, Quebec. | 12 " | 2.00 | Lyman's, Ltd., Montreal. | ..... | ..... . . |
| " 19 | " | 71208 | W. H. Kinnear, 135 St. Jean, Quebec. | 12 " | 1.50 | John Wyeth Bros. | ..... ..... | ..... |
| " 19 | " | 71209 | J. C. Dube, 152 St. Jean, Quebec. | 12 " | 1.50 | Parke Davis Co. | ..... .... | ..... ... .. |
| " 19 | " | 71210 | J. C. Turcot, 117 St. Jean, Quebec. | 12 " | 1.50 | W. Horner Co. | ..... . . | ..... |
| " 19 | " | 71211 | J. C. Livernois, St. Jean and Couillard, Quebec. | 12 " | 2 01 | " .. | ..... | ..... . |
| " 19 | " | 71212 | W. B. Rogers, 24 Fabrique, Quebec. | 12 " | 1.20 | Burroughs Wellcome. | . . ..... | ... .... |
| " 19 | " | 71213 | Laroche & Co., 4 Fabrique, Quebec. | 12 " | 1.80 | " | ..... .... . | ..... |
| " 19 | " | 71214 | L. E. Martel, Quebec | 12 " | 2.40 | " | ..... | ..... |
| **DISTRICT OF QUEBEC PROVINCE** | | | | | | | | |
| June 18 | Extraite fluide de Cascara Sagrada | 5629 | Eugene Fournier, Ste. Jerome. | 12 ozs. | 1.50 | Nat. Drug. | ... ..... | ..... .. |
| " 25 | " | 5649 | J. M. Drew, M.D., Lachute, P.Q. | 12 " | 75 | Burroughs Wellcome & Co. | ..... | . ... ..... |
| July 4 | Cascara Sagrada. | 5023 | E. O. Clontier, Fraserville. | 3 " | 90 | Toronto Pharmacal. | ..... ..... | ... ..... |
| **DISTRICT OF THREE RIVERS—** | | | | | | | | |
| June 12 | Cascara Sagrada. | 7449 | Pharmacie Geoffroy, Joliette. | 1 lb. | ..... | Parke Davis Co., Walkerville. | ... . .... | ..... ..... |
| " 13 | " | 7458 | Dr. J. A. Sarrazin, St. Gabriel de Brandon. | ..... | ..... | J. Wyeth Bros., Philadelphia. | ..... | ..... |
| " 20 | " | 7481 | Phamacie Normand, Three Rivers. | 3 bots. | 75 | Nyals, Ltd. | ..... ... | Reg. No. 3. |
| " 21 | " | 7490 | Dame Turgeon, Sorel. | 3 pkgs | 75 | " ..... | ..... | " |
| " 21 | " | 7491 | J. E. Chevalier Sorel. | 3 " | 75 | Lyman's, Ltd., Montreal. | ... ..... | ... ..... |
| " 21 | " | 7493 | W. Weilbrenner, Sorel | 3 " | 75 | Nat. Drug & Chem. Co., Montreal. | ... .. .... | ..... |

## LIQUID EXTRACT CASCARA SAGRADA.

| Specific Gravity at 15.5° C. | Alcohol by weight in Vol. | Total Solids. | Solids ppted. on dilution. | Ash. | Manganese No. of Extract. | Manganese p. c. in Solids. | Reducing Sugars as Glucose. | Glycerin. | Licorice. | Emodin. | No. of Sample. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **F. N. W. E. BELAND, INSPECTOR.** | | | | | | | | | | | | |
| 1·1070 | 17·80 | 37·52 | ... ... | ... | ... | ... ... | ..... | ..... | ... ..... | ..... | 71205 | |
| 1·2152 | 1·21 | 59·50 | Horner's | Aromatic. | | ... | ..... | ... ... | ... ... | ... ... | 71206 | |
| 1·0674 | 11·76 | 24·36 | ... ... | ..... | ... | ..... | ..... | ..... ... | ..... | ..... | 71207 | |
| 1·0695 | 13·21 | 25·80 | ..... | ..... | ..... | ... ... | ... ... | ..... | ..... | ..... | 71208 | |
| 1·0760 | 20·00 | 31·67 | ..... | ... ... | ..... | ..... | ... ... | ..... | ..... | ..... | 71209 | |
| 1·2273 | 5·36 | 62·67 | Moyes | Aromatic. | | ..... | ..... | ..... | ..... | ..... .. | 71210 | |
| 1·0355 | 16·80 | 17·03 | | „ | | ... ... | ... .. | ..... | ..... | ..... | 71211 | |
| 1·1578 | 2·08 | 57·19 | Burroughs | Wellcome | | Aromatic. | | | ..... | ..... | 71212 | |
| 1·0720 | 17·68 | 29·72 | | „ | | „ | | | ..... ... | ..... | 71213 | |
| 1·0705 | 17·68 | 28·86 | | „ | | „ | | | ... ..... | ..... | 71214 | |
| **N. CADIEUX AND A. PELLETIER, TEMPORARY INSPECTORS.** | | | | | | | | | | | | |
| Sp. Gr. at 20°C. | Alcohol by Vol. | | | | | | | | | | | |
| 1·057 | 12·02 | 22·78 | 0·18 | 3·75 | None. | None. | 1·25 | None. | Present. | Faint... | 5629 | |
| 1·087 | 21·58 | 26·98 | 1·60 | 0·97 | 339 | 0·0105 | 4·64 | „ | None. | Positive | 5649 | |
| 1·080 | 14·45 | 22·06 | 1·12 | 0·84 | 299 | 0·0108 | 5·30 | „ | „ | „ | 5023 | |
| **DR. V. P. LAVALLEE, INSPECTOR.** | | | | | | | | | | | | |
| 1·080 | 26·20 | 30·24 | 3·30 | 1·161 | 149 | 0·0049 | 10·42 | None. | None. | Positive | 7449 | |
| 1·1[illegible] | 21·38 | 53·73 | None. | 2·75 | 55 | 0·0010 | 9·00 | „ | Present. | „ | 7458 | |
| 1·053 | 13·12 | 21·06 | „ | 1·70 | 30 | 0·0014 | 8·38 | „ | None. | Very faint. | 7481 | |
| 1·081 | 13·42 | 23·28 | „ | 2·41 | 30 | 0·0013 | 9·84 | „ | „ | „ | 7490 | |
| 1·[illegible] | None. | 93·88 | „ | 2·35 | 30 | 0·0003 | 2·66 | 26·55 | Present. | Negative. | 7491 | |
| 1·1[illegible] | 0·80 | 61·31 | 1·78 | 3·56 | 592 | 0·0095 | 3·93 | 16·29 | „ | Positive | 7493 | |

| 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. | | Inspector's Report. (Is not an expression of opinion.) |
|---|---|---|---|---|---|---|---|---|
| | | | | Quantity. | Cents. | Manufacturer. | Furnisher. | |
| **DISTRICT OF EASTERN TOWNSHIPS—** | | | | | | | | |
| 1917 | | | | | | | | |
| June 15 | Extract Cascara. | 73891 | J. H. E. Brodeur, St. Hyacinthe. | 12 oz. | 3.00 | Parke Davis, Montreal. | ..... | ..... |
| " 15 | " .. | 73892 | J. E. Viger, St. Hyacinthe. | 12 " . | 1 20 | John Wyeth, Philadelphia. | .... ..... | ..... |
| " 18 | " .. | 7601 | Gustave Bouchard, Sherbrooke. | 12 " . | 2 25 | H. K. Wampole. | .... .... | ..... |
| " 18 | " .. | 7602 | Dr. Chagnon, Sherbrooke. | 12 " . | 1.90 | C. Frosst, Montreal. | .... .... | ..... |
| " 18 | " .. | 7603 | W. H. Griffiths, Sherbrooke. | 12 " . | 3.00 | J. Wyeth. ... | .. ..... | ..... |
| " 19 | " .. | 7605 | W. J. H. McKenzie, Sherbrooke. | 12 " . | 3 00 | Parke Davis, Walkerville. | ..... | ..... |
| " 19 | " .. | 7607 | E. C. Fraser, Sherbrooke. | 12 " . | 2.50 | John Wyeth Bros., Philadelphia. | .. ..... | ..... |
| **DISTRICT OF MONTREAL—** | | | | | | | | |
| Aug. 17 | Cascara Sagrada. | 74368 | R. Martineau, St. Lawrence Boul., Montreal. | 12 oz. | 1.25 | C. E. Frosst Co. | ..... | ..... |
| " 17 | " .. | 74369 | Tippens Pharmacy, 1288 St. Lawrence Boul., Montreal. | 12 " . | 1.00 | McEwen & Co.. | ..... | Aromatic... |
| " 17 | " .. | 74370 | L. Leduc Drug Co., St. Lawrence Boul., Montreal. | 12 " . | 1 00 | John Wyeth Bros. | .... ..... | ..... |
| " 17 | " .. | 74371 | M. Freeman, 1068 St. Lawrence Boul., Montreal. | 12 " . | 1.60 | Parke Davis Co. | ..... | ..... |
| " 20 | " .. | 74372 | Fraser & Bergeron, Fairmount Avenue, Montreal. | 3 bots. | 2.50 | F. W. Horner, Ltd. | ... ..... | ..... |
| **DISTRICT OF VALLEYFIELD** | | | | | | | | |
| June 20 | Cascara Sagrada. | 74341 | F. C. Saunders, Bedford, P.Q. | 12 oz. | 2 25 | John Wyeth & Bro. | ..... | ..... |
| " 21 | " .. | 74342 | A. Bourgeois, St. Johns, P.Q. | 12 " . | 1.50 | Parke Davis Co. | ... ..... | ... ..... |
| " 28 | " .. | 74343 | Geo. W. Johnston, Cowansville, P.Q. | 12 " . | 1.35 | Burrough Wellcome Co. | ..... | ..... .. .. |
| " 30 | " .. | 74344 | Dr. Laroche, Valleyfield, P.Q. | 12 " . | 1.50 | Stearns..... | ..... | ... .. .. |
| July 13 | " .. | 74345 | James Fortune, Huntingdon, P.Q. | 12 " . | 2.40 | Lyman Knox Co., Ltd. | ..... .... | ..... |

## LIQUID EXTRACT CASCARA SAGRADA.

| Results of Analysis. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sp. gr. at 25° C. | Alcohol by Vol. | Total Solids. | Solids ppted. on dilution. | Ash. | Manganese No. of Extract. | Manganese p.c. in Solids. | Reducing Sugars as Glucose. | Glycerin. | Licorice. | Emodin. | No. of Sample. | — |

E. BLONDIN, TEMPORARY INSPECTOR.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1·070 | 23·96 | 28·43 | 1·76 | 1·04 | 109 | 0·0038 | 7·70 | None... | None... | Positive | 73891 |
| 1·075 | 16·62 | 28·37 | 1·54 | 0·68 | 190 | 0·0067 | 6·02 | None... | None... | Positive | 73892 |
| 1·285 | 1·40 | 83·22 | None. | 3·67 | 109 | 0·0013 | 1·40 | 37·03 | Present. | Faint... | 7601 |
| 1·116 | 14·04 | 47·48 | " | 5·10 | Trace | Trace. | 0·44 | 9·98 | " | " | 7602 |
| 1·072 | 17·10 | 25·72 | 1·84 | 0·68 | 299 | 0·0099 | 6·40 | None... | None. | Positive | 7603 |
| 1·070 | 17·28 | 29·97 | 1·82 | 1·02 | 490 | 0·0163 | 5·96 | " | " | " | 7605 |
| 1·072 | 16·28 | 27·90 | 2·14 | 0·72 | 274 | 0·0099 | 5·45 | " | " | " | 7607 |

J. J. COSTIGAN, INSPECTOR.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1·051 | 20·68 | 22·50 | 1·12 | 0·76 | 270 | 0·0119 | 7·10 | None... | None... | Positive | 74368 |
| 1·120 | 2·80 | 68·97 | None. | 1·72 | 422 | 0·0062 | 2·60 | 27·70 | Present. | Faint... | 74369 |
| 1·040 | 14·04 | 15·95 | " | 0·72 | 623 | 0·0390 | 4·60 | None... | None... | Positive | 74370 |
| 1·085 | 19·30 | 31·11 | 3·32 | 1·19 | 109 | 0·0025 | 5·70 | " | " | " | 74371 |
| 1·055 | 21·02 | 17·40 | 1·04 | 0·42 | 190 | 0·0137 | 4·60 | " | " | " | 74372 |

J. J. COSTIGAN, ACTING INSPECTOR.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1·070 | 16·62 | 26·20 | 1·76 | 0·69 | 270 | 0·0105 | 6·62 | None... | None... | Positive | 74341 |
| 1·134 | 19·98 | 37·76 | None. | 5·14 | Trace. | Trace. | 2·04 | " | Present. | Faint... | 74342 |
| 1·072 | 20·68 | 28·72 | 1·40 | 0·884 | 280 | 0·0099 | 8·53 | " | None... | Positive | 74343 |
| 1·168 | 1·32 | 63·97 | None. | 3·74 | 34 | 0·0013 | 3·93 | 21·22 | Present. | Faint... | 74344 |
| 1·048 | 3·76 | 12·72 | 0·68 | 0·59 | 219 | 0·0172 | 2·80 | None... | " | Positive | 74345 |

| 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. | | Inspector's Report. (Is not an expression of opinion.) |
|---|---|---|---|---|---|---|---|---|
| | | | | Quantity. | Cents. | Manufacturer. | Furnisher. | |
| **DISTRICT OF OTTAWA—** | | | | | | | | |
| 1917. | | | | | | | | |
| June 21 | Liquid Extract Cascara Sagrada. | 77518 | D. Belanger, Main St., Hull. | 10 ozs. | 1.50 | Nat. Drug and Chem. Co. | ..... | ..... |
| " 22 | " .. | 77519 | Allen & Cochrane, Nepean and Bank Sts., Ottawa. | 12 " | 1.25 | Burroughs & Wellcome. | ..... | ..... |
| " 26 | " . | 77521 | T. Payment, Clarence and Dalhousie Sts., Ottawa. | 10 " | 1.50 | E. B. Shuttleworth Chem. Co., Toronto. | ..... | ..... |
| " 27 | " .. | 77522 | The A. E. Rea Drug Co., Ottawa. | 11 " | 1.75 | John Wyeth & Bros., Philadelphia. | ..... | ..... |
| July 2 | " .. | 77536 | Geo. E. Watson, Westboro. | 12 " | 1.80 | C. E. Frosst & Co., Montreal. | ..... | ..... |
| " 10 | " .. | 77550 | S. S. Mills, Prescott.. | 11 " | 2.20 | Parke, Davis & Co., Walkerville. | ..... | ..... |
| " 28 | Aromatic Cascara (Active.) | 77563 | L. A. Wilson, Smith's Falls. | 12 " | 1.35 | H. K. Wampole Co., Perth. | ..... | Concentrated bitterless preparation of Cas. Sag. 3 year old bark, assayed to different strength. |
| " 28 | Kasagra.... | 77564 | Wm. Johnston, Smith's Falls. | 12 " | 1.35 | F. Stearns & Co., Windsor. | ..... | A palatable fl. ext. of prime bark of Rhamnus Purshiana. |
| **DISTRICT OF KINGSTON—** | | | | | | | | |
| June 13 | Liquid Extract Cascara Sagrada. | 78375 | W. E. Austin, Kingston. | 12 ozs. | 1 50 | Burrough, Wellcome Co., London. | ..... | ..... |
| " 13 | " .. | 78376 | Estate of C. S. Prouse, Kingston. | 12 " | 1.20 | " " | ..... | ..... |
| " 14 | " .. | 78377 | A. P. Chown, Kingston. | 12 " | 75 | J. Wyeth Bros., Philadelphia. | ..... | ..... |
| " 14 | " .. | 78378 | Mahood Drug Co., Kingston. | 8 " | 2.00 | Parke, Davis Co., Walkerville. | ..... | ..... |
| " 18 | " .. | 78379 | F. C. Clarke, Belleville. | 12 " | 1.80 | Stearns, Windsor. | ..... | ..... |
| " 18 | " .. | 78380 | D. M. Waters, Belleville. | 9 " | 75 | J. Wyeth Bros., Philadelphia. | ..... | ..... |
| " 19 | " .. | 78381 | C. B. Allison, Picton. | 9 " | 1.05 | Stearns, Windsor. | ..... | ..... |

# LIQUID EXTRACT CASCARA SAGRADA.

| Results of Analysis. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sp. gr. at 20° C. | Alcohol by Vol. | Total Solids. | Solids ppted. on Dilution. | Ash. | Manganese No. of Extract. | Manganese p.c. in Solids. | Reducing Sugars as Glucose. | Glycerin. | Licorice. | Emodin. | No. of Sample. | |
| J. A. RICKEY, INSPECTOR. | | | | | | | | | | | | |
| 1·060 | 19·50 | 22·31 | 2·28 | 1·14 | 339 | 0·0152 | 6·67 | None... | None.. | Positive | 77518 | |
| 1·190 | 1·06 | 63·72 | None. | 1·724 | 415 | 0·0065 | 8·07 | 27·22 | " .. | " .. | 77519 | |
| 1·078 | 19·12 | 26·28 | 2·96 | 0·952 | 347 | 0·0132 | 8·12 | None... | " .. | " .. | 77521 | |
| 1·067 | 15·80 | 26·79 | 2·08 | 0·688 | 274 | 0·0102 | 6·67 | " .. | " .. | " .. | 77522 | |
| 1·063 | 19·98 | 24·37 | 1·66 | 0·82 | 305 | 0·0125 | 6·98 | " . | " .. | " .. | 77536 | |
| 1·079 | 27·50 | 31·08 | 2·28 | 1·092 | 199 | 0·0091 | 10·00 | " .. | " .. | " .. | 77550 | |
| 1·281 | 1·06 | 83·15 | None. | 3·87 | 54 | 0·0006 | 0·86 | 33·34 | Present. | " .. | 77563 | |
| 1·182 | 1·06 | 67·25 | " | 4·00 | 40 | 0·0016 | 1·10 | 23·77 | " .. | Faint... | 77564 | |
| JAMES HOGAN, INSPECTOR. | | | | | | | | | | | | |
| 1·184 | 1·60 | 68·91 | None. | 2·21 | 281 | 0·0042 | 3·98 | 30·93 | None... | Positive | 78375 | |
| 1·187 | 1·40 | 74·75 | " | 1·79 | 452 | 0·0061 | 4·74 | 34·26 | " .. | " .. | 78376 | |
| 1·090 | 21·34 | 21·09 | 2·00 | 0·75 | 654 | 0·0311 | 6·60 | None .. | " .. | " .. | 78377 | |
| 1·090 | 17·50 | 32·41 | 3·46 | 1·22 | 136 | 0·0042 | 7·33 | " .. | " .. | " .. | 78378 | |
| 1·094 | 16·28 | 34·23 | 2·86 | 1·19 | 218 | 0·0064 | 6·23 | " .. | " .. | " . | 78379 | |
| 1·085 | 16·00 | 33·34 | 3·20 | 0·89 | 545 | 0·0163 | 5·97 | " . | " .. | " .. | 78380 | |
| 1·187 | 1·60 | 68·55 | None. | 3·84 | 190 | 0·0028 | 1·55 | 24·38 | " .. | Faint... | 78381 | |

| Date of Collection. | Nature of Sample. | No. of Sample. | Name and Address of Vender. | Cost. | | Name and Address of Manufacturer or Furnisher, as given by the Vender. | | Inspector's Report. (Is not an expression of opinion.) |
|---|---|---|---|---|---|---|---|---|
| | | | | Quantity. | Cents. | Manufacturer. | Furnisher. | |
| **DISTRICT OF KINGSTON—** | | | | | | | | |
| 1917. | | | | | | | | |
| June 19 | Liquid Extract Cascara Sagrada. | 78382 | W. A. Wright, Picton | 8 ozs. | 1.20 | Stearns, Windsor. | ..... | ..... |
| " 19 | " .. | 78383 | E. W. Case, Picton.. | 9 " | 90 | " " | ..... | ..... |
| " 19 | " .. | 78384 | J. H. Dickey, Trenton, Ont. | 9 " | 90 | Burroughs, Wellcome Co., London. | ..... | ..... |
| " 19 | " .. | 78385 | E. F. Fraser, Trenton, Ont. | 7½ " | 1 10 | " " | ..... | ..... |
| " 19 | " .. | 78386 | J. Shurie, Trenton, Ont. | 9 " | 75 | Stearns, Windsor. | ..... | ..... |
| " 21 | " . | 78387 | McDermid & Jury, Peterboro. | 9 " | 1.80 | Parke, Davis Co., Walkerville. | ..... | ..... |
| " 21 | " .. | 78388 | W. J. Kent, Peterboro. | 9 " | 75 | J. Wyeth Bros., Philadelphia. | ..... | ..... |
| " 21 | " .. | 78389 | Wm. Madill, Peterboro. | 9 " | 1.50 | Lyman, Toronto. | ..... | ..... |
| **DISTRICT OF TORONTO—** | | | | | | | | |
| June 21 | Liq. Ext. Cascara. | 77901 | Miss G. Gallagher, 756 Broadview Ave., Toronto. | 12 ozs. | 1.30 | ..... | E. G. West & Co., Toronto. | ..... |
| " 21 | " .. | 77903 | J. T. B. Balkwell, 257 Danforth Ave., Toronto. | 12 " | 1 00 | J. Wyeth & Co., Philadelphia. | ..... | ..... |
| " 21 | " .. | 77904 | Hooper's Drug Store, 209 Bloor St., E., Toronto. | 12 " | 1.40 | C. E. Frosst & Co., Montreal. | ..... | ..... |
| " 23 | " .. | 77905 | F. W. Sieveright, Sherbourne & Wilton, Toronto. | 12 " | 1.75 | National Drug & Chemical Co., Toronto. | ..... | ..... |
| " 26 | " .. | 77906 | The T. Eaton Co., Ltd., Queen & Yonge St., Toronto. | 12 " | 1.00 | Vendors ..... | ..... | ..... |
| " 26 | " .. | 77907 | Wm. Adams, 267 Queen St., W., Toronto, | 9 " | 1.08 | F. Stearns & Co., Windsor. | ..... | ..... |
| " 26 | " . | 77908 | W. J. A. Carnahan, 393 Church St., Toronto. | 12 " | 1.50 | Burroughs, Wellcome Co., London. | ..... | ..... |
| " 27 | " .. | 77909 | W. C. Avery, 700 Yonge St., Toronto. | 12 " | 2.00 | H. K. Wampole Co., Perth. | ..... | ..... |
| " 27 | " .. | 77910 | The Lyman Bros. & Co., Ltd., 71 Front St., E., Toronto. | 3 bots. | 1.71 | J. Wyeth & Bros., Philadelphia. | ..... | ..... |
| " 27 | " .. | 77911 | The Drug Trading Co., Ltd., 10 Ontario St., Toronto. | 3 " | 1.40 | F. Stearns Co., Ltd., Windsor. | ..... | ..... |

## LIQUID EXTRACT CASCARA SAGRADA.

| Results of Analysis. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Specific Gravity at 20° C. | Alcohol by Vol. | Total Solids. | Solids ppted. on Dilution. | Ash. | Manganese No. of Extract. | Manganese p.c. in Solids. | Reducing Sugars as Glucose. | Glycerin. | Licorice. | Emodin. | No. of Sample. | — |

*Concluded.*

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1·093 | 14·04 | 31·37 | 2·72 | 1·15 | 490 | 0·0156 | 8·01 | None... | None... | Positive | 78382 | |
| 1·180 | 0·64 | 66·16 | None. | 3·38 | 163 | 0·0025 | 2·24 | 21·3 | Present. | Faint... | 78383 | |
| 1·068 | 22·41 | 31·35 | 1·18 | 0·83 | 442 | 0·0141 | 4·79 | None.. | None. | Positive | 78384 | |
| 1·073 | 22·20 | 29·37 | 1·62 | 0·91 | 339 | 0·0115 | 8·29 | " .. | " .. | " .. | 78385 | |
| 1·21 | 0·80 | 66·38 | None. | 3·80 | 190 | 0·0028 | 1·03 | 21·73 | Present. | Faint.. | 78386 | |
| 1·060 | 21·38 | 25·22 | 1·88 | 0·99 | 109 | 1·0043 | 6·60 | None... | None... | Positive | 78387 | |
| 1·058 | 16·28 | 18·36 | 1·14 | 0·75 | 488 | 0·0261 | 6·60 | " .. | " .. | " .. | 78388 | |
| 1·071 | 16·80 | 27·93 | 2·06 | 0·72 | 219 | 0·0078 | 6·67 | " .. | " .. | " .. | 78389 | |

H. J. DAGER, INSPECTOR.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1·059 | 20·50 | 22·92 | 2·00 | 0·75 | 494 | 0·0216 | 6·70 | None... | None... | Positive | 77901 |
| 1·051 | 14·68 | 17·59 | 0·70 | 0·76 | 488 | 0·0277 | 8·22 | " .. | " .. | " .. | 77903 |
| 1·056 | 20·34 | 21·65 | 1·40 | 0·74 | 298 | 0·0138 | 6·76 | " . | " .. | " .. | 77904 |
| 1·064 | 19·96 | 22·58 | 1·54 | 1·15 | 401 | 0·0178 | 7·29 | " .. | " .. | " .. | 77905 |
| 1·072 | 17·44 | 26·26 | 1·52 | 0·94 | 410 | 0·0156 | 6·88 | " .. | " .. | " .. | 77906 |
| 1·115 | 17·28 | 37·63 | 4·78 | 1·54 | 244 | 0·0065 | 6·31 | " .. | " .. | " .. | 77907 |
| 1·068 | 21·20 | 26·77 | 2·02 | 1·10 | 403 | 0·0151 | 4·03 | " .. | " .. | " .. | 77908 |
| 1·074 | 17·94 | 26·87 | 2·66 | 1·02 | 411 | 0·0153 | 6·31 | " .. | " .. | " .. | 77909 |
| 1·075 | 15·58 | 29·82 | 2·11 | 0·71 | 120 | 0·0040 | 10·3 | " .. | " .. | " .. | 77910 |
| 1·092 | 23·14 | 34·33 | | | 218 | 0·0028 | 7·44 | .. | " .. | " .. | 77911 |

| Date of Collection. | Nature of Sample. | No. of Sample. | Name and Address of Vendor. | Cost. | | Name of Address of Manufacturer or Furnisher as given by the Vendor. | | Inspector's Report. (Is not an expression of opinion.) |
|---|---|---|---|---|---|---|---|---|
| | | | | Quantity. | Cents. | Manufacturer. | Furnisher. | |
| **DISTRICT OF HAMILTON—** | | | | | | | | |
| 1917 | | | | | | | | |
| July 3 | Liq. Ext. Cascara Sagrada. | 77974 | J. B. Broadfoot, 99 Wyndham St., Guelph. | 12 ozs. | 2.08 | F. Stearns & Co., Windsor. | ..... ..... | ..... ... |
| " 4 | " .. | 77975 | Alex. Stewart, 65 Wyndham St., Guelph. | 12 " | 1.20 | Burroughs, Wellcome Co., London. | ..... | B. P. 1914.. |
| " 5 | " .. | 77976 | A. J. Roos, 54 King St., Kitchener. | 12 " | 1.40 | F. Stearns & Co., Windsor. | ..... ..... | ..... |
| " 5 | " .. | 77977 | H. W. Shoemaker, 72 King St., Kitchener. | 12 " | 1.00 | Toronto Pharmacal Co., Ltd., Toronto. | ..... | ..... |
| " 9 | " .. | 77978 | C. A. C. Cameron, 203 Colborne St., Brantford. | 12 " | 3.00 | Davis & Lawrence. Montreal. | ..... .... | .... ..... |
| " 9 | " .. | 77979 | G. F. McDonald, 212 Colborne St., Brantford. | 10 " | 1.75 | J. Wyeth & Bros., Philadelphia. | .. ... . | ..... |
| " 10 | " .. | 77980 | Potter & Shaw, 99 St. Paul St., St. Catharines. | 12 " | 1.00 | Parke, Davis & Co., Walkerville. | ..... | ..... .... |
| " 10 | " .. | 77981 | Abbs & McNamara, 30 Queen St., St. Catharines. | 12 " | 1.25 | Burroughs, Wellcome Co., London. | ..... ... | B. P. 1914.. |
| " 12 | " .. | 77982 | F. W. Mills, 332 King St., E., Hamilton. | 12 " | 1.35 | Nat. Drug & Chemical Co., Hamilton. | .... ..... | ..... |
| 12 | " .. | 77983 | W. A. Howell, King and Emerald Sts., Hamilton. | 12 " | 1 50 | " " | ..... ..... | . ..... |
| **DISTRICT OF WINDSOR—** | | | | | | | | |
| June 12 | Liq. Extract Cascara. | 65216 | W. S. Cole, Exeter .. | 12 ozs. | 1 50 | Stearns & Co., Windsor. | ... ..... | ..... |
| " 15 | " | 65246 | J. G. Karn, Woodstock, Ont. | 12 " | 1 35 | J. Wyeth & Bro., Philadelphia. | .... ..... | ..... .. |
| " 18 | " .. | 65250 | Standard Drug Co., London. | 12 " | 90 | Frosst Co., Montreal. | ..... ..... | ..... |
| " 18 | " .. | 65252 | H. J. Childs, London East. | 12 " | 1 80 | Burroughs Wellcome Co., London. | ..... .... | ..... ... |
| " 19 | " .. | 65258 | E. C. Harvey, St. Thomas. | 12 " | 1.50 | " " | ..... | ..... ... |
| **DISTRICT OF NORTHERN ONTARIO—** | | | | | | | | |
| July 5 | Cascara. .... | 78615 | Curtis Defoe Co., Haileybury. | 12 ozs. | 1.20 | J. Wyeth & Bro., Philadelphia. | Lymans Ltd., Montreal. | .... ... |

## LIQUID EXTRACT CASCARA SAGRADA.

| Results of Analysis. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sp. Gr. at 20° C. | Alcohol by Vol. | Total Solids. | Solids ppted. on dilution. | Ash. | Manganese No. of Extract. | Manganese p. c. Solids. | Reducing Sugars as Glucose. | Glycerin. | Licorice. | Emodin. | No. of Sample. | |

H. J. DAGER, ACTING INSPECTOR.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1·093 | 23·86 | 33·67 | 4·06 | 1·50 | 218 | 0·0065 | 6·06 | None... | None... | Positive | 77974 |
| 1·073 | 20·70 | 31·41 | 1·28 | 0·98 | 381 | 0·0123 | 7·98 | " .. | " .. | " .. | 77975 |
| 1·101 | 19·98 | 34·48 | 0·68 | 1·652 | 179 | 0·0052 | 11·37 | " .. | " .. | " .. | 77976 |
| 1·071 | 19·64 | 26·89 | 2·48 | 1·00 | 436 | 0·0163 | 7·34 | " .. | " .. | " .. | 77977 |
| 1·058 | 20·00 | 23·59 | 1·08 | 0·56 | 256 | 0·0108 | 5·19 | " .. | " .. | " .. | 77978 |
| 1·076 | 16·28 | 30·47 | 2·72 | 0·70 | 154 | 0·0051 | 7·26 | " .. | " .. | " .. | 77979 |
| 1·076 | 25·66 | 31·06 | 1·98 | 1·18 | 244 | 0·0078 | 8·43 | " . | " .. | " .. | 77980 |
| 1·071 | 22·08 | 28·17 | 1·22 | 1·02 | 582 | 0·0189 | 4·64 | " .. | " .. | " .. | 77981 |
| 1·060 | 18·80 | 21·44 | 1·22 | 0·968 | 236 | 0·0112 | 7·18 | " .. | " .. | " .. | 77982 |
| 1·065 | 19·98 | 25·19 | 2·24 | 1·08 | 339 | 0·0134 | 8·53 | " .. | " .. | " .. | 77983 |

JOHN TALBOT, INSPECTOR.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1·200 | 1·06 | 64·16 | None. | 3·57 | 190 | 0·0029 | 7·13 | 19·6 | Present. | Faint... | 65216 |
| 1·073 | 16·12 | 28·95 | 1·49 | 0·76 | 190 | 0·0065 | 7·13 | None... | None... | Positive | 65246 |
| 1·240 | 9·90 | 75·09 | None. | 2·04 | 190 | 0·0025 | 2·49 | 33·28 | Present. | Faint .. | 65250 |
| 1·072 | 23·00 | 28·76 | 1·48 | 0·80 | 274 | 0·0095 | 6·19 | None... | None... | Positive | 65252 |
| 1·080 | 22·44 | 34·09 | 0·92 | 0·89 | 436 | 0·0128 | 9·18 | " ... | " ... | " | 65258 |

THOS. E. ARMSTRONG, INSPECTOR.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1·153 | 16·28 | 46·21 | Trace. | 1·10 | 33 | 0·0007 | 3·68 | Present. | None... | Positive | 78615 |

| 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. | | Inspector's Report. (Is not an expression of opinion.) |
|---|---|---|---|---|---|---|---|---|
| | | | | Quantity. | Cents. | Manufacturer. | Furnisher. | |
| **DISTRICT OF NORTHERN ONTARIO—** | | | | | | | | |
| 1917. | | | | | | | | |
| July 5 | Cascara Sagrada. | 78618 | Strong Drug Co. Haileybury. | 12 ozs. | 1 35 | Burroughs Wellcome Co., London. | | |
| **DISTRICT OF MANITOBA—** | | | | | | | | |
| June 28 | Liq. Extract Cascara Sagrada. | 75392 | G. O. Hill, 308 Nairne Ave., Elmwood. | 12 ozs. | 1.85 | C. E. Frosst, Montreal. | | |
| July 5 | " | 75393 | J. W. Hewith, Melita | 12 " | 1.75 | Parke Davis & Co., Walkerville. | | |
| " 30 | " | 75396 | McCullough's Drug Store, 912 Rosser Ave., Brandon. | 12 " | 80 | Burroughs Wellcome Co., Montreal. | | |
| " 30 | " | 75398 | Kennedy's Pharmacy, Brandon. | 12 " | 2.75 | Toronto Pharmacal Co., Toronto. | | |
| " 30 | " | 75399 | Robertson's Drug Store, Brandon. | 12 " | 1.50 | Burroughs Wellcome Co., Montreal. | | |
| " 31 | " | 75400 | Hutching's Drug Store, 658 Tenth St., Brandon. | 12 " | 3.00 | Parke Davis Co., Walkerville. | | |
| " 24 | " | 79515 | Limo Drug Co., 407 Selkirk Ave., Winnipeg. | 10 " | 2.00 | " " | | |
| " 24 | " | 79516 | Bartlett's Drug Store, 410 Selkirk Ave., Winnipeg. | 9 " | 1.50 | Burroughs Wellcome Co., London. | | |
| " 25 | " | 79517 | McLenna's Drug Store, 593 Selkirk Ave., Winnipeg. | 12 " | 1.50 | C. E. Frosst, Montreal. | | |
| Aug. 2 | " | 79531 | Brathwaite Drug Store, 288 Main St., Winnipeg. | 12 " | 1.50 | Burroughs Wellcome Co., London. | | |

## LIQUID EXTRACT CASCARA SAGRADA.

| Results of Analysis. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sp. Gr. at 20° C. | Alcohol by Vol. | Total Solids. | Solids ppted. on Dilution. | Ash. | Manganese No. of Extract. | Manganese p.c. in Solids. | Reducing Sugars as Glucose. | Glycerin. | Licorice. | Emodin. | No. of Sample. | — |
| *Concluded.* | | | | | | | | | | | | |
| 1·070 | 21·51 | 27·64 | 1 44 | 1 13 | 331 | 0·0120 | 7 00 | None... | None.. | Positive | 78618 | |

J. B. COSGROVE, INSPECTOR.

| Sp. Gr. at 15·5° C. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1·069 | 19·28 | 24·10 | ..... | . . | . | ..... | ..... | ..... | ..... | ..... | 75392 |
| 1·072 | 29·86 | 28·60 | ..... | .. ... | .... | ..... | ..... | ..... | .. .... | ..... | 75393 |
| 1·079 | 23 01 | 27·30 | ..... | .... | ..... | ..... | ..... | ..... | ..... | ..... | 75396 |
| 1·068 | 16·52 | 21·76 | ..... | ..... | . . | .. ... | ..... | ..... | ..... | ..... | 75398 |
| 1·079 | 22 55 | 28·40 | ..... | .... | .... | ..... | .... | ..... | ..... | ... ... | 75399 |
| 1·074 | 30·04 | 28·70 | ... | .. . | ..... | ..... | . . . | ..... | ..... | ..... | 75400 |
| 1·071 | 28·41 | 27·10 | ... | ..... | ..... | . ... | .... | ..... | . .... | ..... | 79515 |
| 1·067 | 22·18 | 23·50 | ..... | ..... | ..... | ... | . .... | ..... | ..... | ... .... | 79516 |
| 1·057 | 18 88 | 20 0 | ..... | .... | .... | ..... | ..... | ..... | ..... | ... ... | 79517 |
| 1·078 | 22·55 | 27·80 | . .. | ..... | ..... | ..... | ..... | ..... | . ..... | ..... | 79531 |

| 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 SOUTHERN SASKATCHEWAN—** | | | | | | | |
| 1917. | | | | | | | |
| June 14 | Liq. Extract of Cascara Sagrada. | 77039 | E. B. Carruthers, Moose Jaw | 12 ozs. | 3 00 | C. E. Frosst, Montreal. | |
| " 15 | " .. | 77042 | Leonard Fysh, " | 12 " | 3 00 | " .. | |
| " 22 | " .. | 77063 | Kelly Drug Co., " | 12 " | 3 00 | " | |
| " 23 | " .. | 77064 | E. A. Jolly, " | 12 " | 3 00 | Burroughs Wellcome Co., London | |
| " 23 | " .. | 77067 | Walter E. Arend, " | 12 " | 3 00 | Parke-Davis & Co., Walkerville. | |
| July 12 | " .. | 77068 | Gavin Bros., Morse, Sask... | 12 " | 3 00 | " .. | |
| " 14 | " .. | 77073 | T. W. Hutcheson, Swift Current. | 12 " | 2 50 | Burroughs Wellcome Co., London | |
| Aug. 7 | " . | 77085 | A. A. Beirnes, Strassburg... | 12 " | 3 00 | Parke-Davis & Co., Walkerville | |
| " 8 | " | 77088 | Campbell's Pharmacy, Regina | 12 " | 3 00 | Burroughs Wellcome Co., London | |
| " 8 | " .. | 77089 | Regina Pharmacy Ltd., " | 12 " | 3 00 | Unknown | |
| **DISTRICT OF NORTHERN SASKATCHEWAN—** | | | | | | | |
| July 31 | Liq. Extract of Cascara Sagrada. | 78507 | L. A. Brown, North Battleford. | 12 ozs. | 1 05 | United Drug Co., Toronto. | |
| " 31 | " .. | 78509 | J. H. Abbott, " | 12 " | 2 00 | C. E. Frosst, Montreal. | |
| **DISTRICT OF ALBERTA—** | | | | | | | |
| June 14 | Liq. Extract of Cascara Sagrada. | 52683 | Wendell Maclean, Calgary.. | 3 bots. | 3 00 | Burroughs Wellcome Co., London | |
| " 14 | " .. | 52684 | McGill's Drug Store, Calgary | 3 " | 1 50 | " " .. | |
| " 14 | " .. | 52685 | J. J. Weinfield Drug Co, Ltd., Calgary. | 3 " | 2 25 | Nat. Drug & Chem Co., Montreal. | |
| " 21 | " .. | 52686 | E. M. Carpenter, Edmonton | 3 " | 1 50 | " " . | |
| " 21 | " .. | 52687 | H. L. Hunt, Edmonton..... | 3 " | 1 50 | F. Stearns Co., Ltd., Windsor. | |
| " 23 | " .. | 52688 | Mooney Drug Co., Leduc... | 3 " | 1 50 | Nat. Drug & Chem. Co., Montreal. | |
| " 28 | " .. | 52689 | Hume Pingle, Medicine Hat | 3 " | 2 25 | Burroughs Wellcome Co., Montreal. | |
| " 29 | " .. | 52690 | Kenney and Allen, Lethbridge. | 3 " | 1 50 | C. E. Frosst & Co., Montreal. | |
| " 29 | " .. | 52691 | J. D. Higinbotham, Lethbridge. | 3 " | 1 50 | F. Stearns & Co,, Ltd., Windsor | |
| July 9 | " .. | 52692 | Harvey Drug Co., Calgary.. | 3 " | 1 20 | Burroughs Wellcome Co., London | |

# LIQUID EXTRACT CASCARA SAGRADA.

| Inspector's Report. (Is not an expression of opinion.) | Results of Analysis. | | | | — | No. of Sample. | — |
|---|---|---|---|---|---|---|---|
| | Sp. Gr. at 15·5° C. | Alcohol by vol. | Total Solids. | Liquorice. | | | |
| L. H. HALL, INSPECTOR. | | | | | | | |
| ..... ... | 1·065 | 19·08 | 22·78 | ..... ... | ... ..... | 77039 | |
| ..... ... | 1·062 | 19·96 | 21·84 | ... .... | ..... ... | 77042 | |
| ..... | 1·064 | 19·96 | 22·78 | ..... | ... ..... | 77063 | |
| ... ..... | 1·077 | 23·19 | 26·24 | ..... | ... ..... | 77064 | |
| .. ... .. .. | 1·083 | 20·15 | 28·64 | .. . ..... | ..... ... .... | 77067 | |
| ..... .. | 1·073 | 28·41 | 27·30 | ... ..... | .. ..... .... | 77068 | |
| ..... .... | 1·060 | 23·01 | 23·10 | ..... | . . .... ..... | 77073 | |
| ..... | 1·173 | 11·70 | 51·20 | Present... | ..... ..... | 77085 | |
| .. ... .... | 1·070 | 22·55 | 24·90 | .... ... | ..... .... . | 77088 | |
| ..... | 1·070 | 23·19 | 25·80 | ... ..... | ..... .... ... | 77089 | |
| J. M. DANIS, INSPECTOR. | | | | | | | |
| ..... . | 1·164 | 0·60 | 43·10 | ..... .. | ... . ..... | 78507 | |
| ..... | 1·054 | 21·19 | 19·20 | ... ..... | Labelled aromatic cascara. | 78509 | |
| A. W. R. MARKLEY, INSPECTOR. | | | | | | | |
| ..... | 1·191 | 1·19 | 50·60 | .. ..... | .. . ..... | 52683 | |
| Glycerinated..... | 1·184 | 2·51 | 48·00 | Present... | ..... .. | 52684 | |
| Rhamnus Purshiana. | 1·061 | 19·28 | 21·66 | ..... | ..... ... .... | 52685 | |
| Cascara..... | 1·162 | 7·01 | 40·78 | . ..... | ..... ... | 52686 | |
| Kasagra..... ... . | 1·185 | 0·93 | 49·20 | ..... | ..... | 52687 | |
| ..... | 1·061 | 20·33 | 21·30 | ..... | ..... ..... | 52688 | |
| ..... | 1·176 | 23·28 | 27·10 | ..... | ..... .... ..... | 52689 | |
| ..... ..... | 1·064 | 20·15 | 23·12 | ..... | . . ..... | 52690 | |
| Kasagra..... . | 1·185 | 1·06 | 49·70 | Present... | ..... | 52691 | |
| Glycerinated..... | 1·188 | 1·[illegible] | 50·40 | ..... | ..... .... .. . | 52692 | |

| 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 ROCKY MOUNTAINS—** | | | | | | | |
| 1917. | | | | | | | |
| July 13 | Ext. Cascara Sagrada. | 68416 | E. W. Hazlewood, Trail.... | 12 ozs. | 2 00 | F. Stearns Co., Windsor. | ..... |
| " 17 | " ... | 68445 | W. H. Wainman, Rossland | 8 " | 1·25 | Nat. Drug & Chem. Co., Montreal. | ..... |
| " 17 | " ... | 68446 | T. Stout, Rossland..... .... | 12 " | 3·00 | Parke Davis Co., Walkerville. | ..... |
| " 24 | " ... | 68458 | Poole Drug Co., Nelson ... | 12 " | 2 00 | C. E. Frost & Co., Montreal. | ..... |
| " 24 | " ... | 68459 | Canada Drug & Book Co., Nelson. | 12 " | 2·55 | Burroughs Wellcome, Montreal. | ..... |
| " 24 | " ... | 68460 | City Drug & Stationery Co., Nelson. | 12 " | 1·50 | Davis & Lawrence, Montreal. | ..... |
| **DISTRICT OF VANCOUVER** | | | | | | | |
| June 22 | Liquid Extract Cascara Sagrada. | 75852 | Broadway Pharmacy, Broadway and Granville, Vancouver. | 12 ozs. | 3 50 | F. Stearns & Co., Windsor. | .... ... .... |
| " 22 | " .. | 75853 | Cunningham Drug Store, 13th and Granville, Vancouver | 12 " | 1·50 | " . | ..... .... |
| " 22 | " .. | 75854 | John M. White, 11th Ave. and Main St., Vancouver. | 12 " | 1·50 | C. E. Frost & Co., Montreal. | ..... . |
| " 22 | " .. | 75855 | Pacific Drug Stores, Ltd., 7th Ave. and Main St., Vancouver. | 12 " | 1·85 | J. A. Tepoorten, Ltd., Vancouver. | ..... |
| " 22 | " .. | 75856 | O. C. Rutledge, Cedar St. and 4th Ave., Vancouver | 12 " | 1·50 | Nat. Drug & Chem. Co. of Canada. | ..... |
| " 23 | " .. | 75857 | Law's Drug Store, 249 Main St., Vancouver. | 12 " | 4·40 | Parke-Davis & Co., Walkerville. | ..... ..... |
| " 23 | " .. | 75858 | J. H. Moran, 476 Broadway W., Vancouver. | 12 " | 2·90 | Nat. Drug & Chem. Co. of Canada. | ..... |
| " 25 | " .. | 75859 | MacLennan's Drug Store, 750 Columbia St., Vancouver | 12 " | 2·00 | Parke-Davis & Co., Walkerville. | .... . . ..... |
| 26 | " .. | 75860 | Cunningham Drug Stores, Nelson and Denman Sts., Vancouver. | 12 " | 3·00 | F. Stearns & Co., Windsor. | ..... ..... |
| " 26 | " .. | 75861 | McDuffee Bros., 76 Cordova St. E., Vancouver. | 12 " | 2·20 | Parke Davis & Co., Walkerville. | .... .. ... . .. |
| **DISTRICT OF VICTORIA—** | | | | | | | |
| July 13 | Liquid Extract Cascara Sagrada. | 75892 | J. B. Hodgins, Nanaimo.... | 11 ozs. | 2·75 | Parke-Davis & Co., Walkerville. | ... ..... |

## LIQUID EXTRACT CASCARA SAGRADA.

| Inspector's Report. (Is not an expression of opinion). | Results of Analysis. | | | | | | | No. of Sample. | |
|---|---|---|---|---|---|---|---|---|---|
| | Sp. gr. at 15·6° C. | Grammes per 100 cc. | | Colour reaction using the ethyloxide extract of the dealcoholized material. | | | | | |
| | | Ethylalcohol per 8.G. of distillate to equal volume. | Total solids, including glycerol; Residue 16 hrs. at 70°C. in vacuo. | Colour of aqueous layer with 5% ammonia. | Colour of aqueous layer with saturated borax solution. | Colour of precipitate with chlorinated lime solution. | | | |
| THOS. PARKER, INSPECTOR | | | | | | | | | |
| | 1·0802 | 17·44 | 29·05 | Deep red.... | Pinkish Brown. | Deep red brown. | | 68446 | |
| | 1·0861 | 17·07 | 29·70 | " .. | " ... | " ... | | 68445 | |
| | 1·0743 | 22·66 | 30·41 | " .. | " ... | " ... | | 68446 | |
| | 1·0734 | 15·07 | 26·39 | " ... | " ... | " ... | | 68458 | |
| | 1·1890 | 0·63 | 67·22 | " ... | " ... | " ... | | 68459 | |
| | 1·0828 | 14·07 | 31·03 | Bluish red.. | Light pink.. | Brownish red. | | 68460 | |
| G. G. ARMYTAGE, INSPECTOR. | | | | | | | | | |
| | 1·0877 | 19·58 | 31·57 | Deep Red .. | Pinkish Brown. | Deep Red Brown. | | 75852 | |
| | 1·1953 | 0·81 | 57·11 | Faint Pink Brown. | Faint Brown | Faint Yellow Brown. | | 75853 | |
| | 1·2495 | 0·85 | 69·44 | " | " | " | | 75854 | |
| | 1·0757 | 17·08 | 31·84 | Deep Red .. | Pinkish Brown. | Deep Red Brown. | | 75855 | |
| | 1·1556 | 5·97 | 41·02 | Faint Pink Brown. | Faint Brown | Faint Yellow Brown. | | 75856 | |
| | 1·0742 | 21·92 | 30·02 | Deep Red .. | Pinkish Brown. | Deep Red Brown. | | 75857 | |
| | 1·0834 | 17·06 | 30·40 | Bluish Red.. | " | " | | 75858 | |
| | 1·0743 | 22·42 | 30·86 | Deep Red .. | " | " | | 75859 | |
| | 1·0940 | 18·59 | 34·08 | " | " | " | | 75860 | |
| | 1·0746 | 22·31 | 30·68 | " | " | " | | 75861 | |
| G. G. ARMYTAGE, INSPECTOR. | | | | | | | | | |
| | 1·0795 | 16·27 | 28·54 | Deep Red .. | Pinkish Brown. | Deep Red Brown. | | 75892 | |

DISTRICT OF VICTORIA—

| 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. |
| 1917. | | | | | | | |
| July 13 | Liquid Extract Cascara Sagrada. | 75893 | F. C. Stearman, Nanaimo .. | 12 ozs. | 2·50 | C. E. Frosst, Montreal. | ..... |
| " 25 | " . | 75894 | Ivel's Pharmacy, 1200 Douglas St., Victoria. | 10 " | 1·25 | Burroughs-Wellcome Co., London. | ..... |
| " 26 | " .. | 75895 | Geo. A. Fraser & Co., 912 Govt. St., Victoria. | 12 " | 1·50 | Parke-Davis & Co., Walkerville. | ..... |
| " 26 | " .. | 75896 | W. S. Terry, Douglas and Pandora Sts., Victoria. | 6 " | 1·20 | " | ..... |
| " 26 | " . | 75897 | Thos. Shotbolt, 589 Johnson St., Victoria. | 12 " | 1·40 | F. Stearns & Co., Windsor. | ..... |
| " 26 | " .. | 75898 | W. W. Gardiner, Cook and Pandora Ave., Victoria. | 10 " | 1·25 | Nat. Drug & Chem. Co., Windsor. | ..... |
| " 27 | " .. | 75899 | Cyrus H. Bowes, Govt. and View Sts., Victoria. | 12 " | 1·50 | " .. | ..... |
| " 27 | " .. | 75900 | Hall & Co., Yates and Douglas Sts., Victoria. | 12 " | 1·25 | C. E. Frosst, Montreal. | ..... |
| " 27 | " . | 75901 | Aaronson & Elwin, Cook and Fort Sts., Victoria. | 12 " | 1·80 | Parke-Davis & Co., Walkerville. | ..... |

## LIQUID EXTRACT CASCARA SAGRADA.

| Inspector's Report. (Is not an expression of opinion). | Results of Analysis. | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Sp. gr. at 15·6° C. | Grammes per 100 cc. | | Colour reaction using the ethyl oxide extract of the dealcoholized material. | | | No. of Sample. |
| | | Ethyl alcohol per S.G. of distillate to equal volume. | Total solids including glycerol; Residue 16 hrs. at 70°C. in vacuo. | Colour of aqueous layer with 5% ammonia. | Colour of aqueous layer with saturated borax solution. | Colour of precipitate with chlorinated lime solution. | |
| *Concluded.* | | | | | | | |
| .... ..... | 1·0651 | 15·31 | 24·54 | Deep Red .. | Pinkish Brown. | Deep Red Brown. | 75893 |
| .. ..... | 1·1917 | 0·78 | 66·36 | Red..... | Faint Brown | Slight Red Brown. | 75894 |
| .... ... .. | 1·1920 | 0·86 | 66·58 | Deep Red .. | Pinkish Brown. | Deep Red Brown. | 75895 |
| .. ..... | 1·0881 | 14·88 | 30·90 | " .. | " | " | 75896 |
| ..... ..... | 1·1218 | 15·77 | 39·15 | Red ..... | Faint Brown | " | 75897 |
| ..... ... | 1·0730 | 15·41 | 25·98 | Deep Red .. | Pinkish Brown. | " | 75898 |
| .... .. .... | 1·0743 | 16·43 | 26·18 | " .. | " | " | 75899 |
| .... ..... | 1·0623 | 14·69 | 23·22 | " .. | " | " | 75900 |
| .... ..... | 1·0761 | 19·33 | 29·26 | " .. | " | " | 75901 |