

ROYAL COMMISSION

REPORT OF THE COMMISSIONER

CONCERNING

MILITARY CLOTH

(AUBURN WOOLLEN MILLS CO.)

COMMISSIONER:

The Honourable Sir CHARLES DAVIDSON, Knight



OTTAWA

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1917

THE AUBURN WOOLLEN MILLS COMPANY.

REPORT ON MY INVESTIGATION OF CHARGES ALLEGING INFERIOR QUALITY OF FRIEZE MANUFACTURED BY THE AUBURN WOOLLEN MILLS COMPANY, OF PETERBOROUGH, ONT., AND SOLD TO THE DEPARTMENT OF MILITIA AND DEFENCE.

Capt. JOHN THOMPSON, K.C., in aid of the Commissioner.

J. A. HUTCHESON, Esquire, K. C., (in succession to Captain Thompson, who became wholly engaged in the military duties which preceded his present Overseas Service.)

D. O'CONNELL, Esquire, K.C., for the Auburn Woollen Mills company.

This investigation resulted from the following affidavit, brought to the attention of The Honourable the Solicitor General and of myself by J. H. Burnham, Esquire, Member of Parliament for West Peterborough, within which county the mills are situate:—

“PETERBOROUGH,

“IN THE MATTER OF a certain contract between The Auburn Woollen Mills Company of Peterborough for the supply of overcoating by the Auburn Woollen Mills Co. to The Government of Canada.

“I, George Greaves, of the city of Peterborough, in the county of Peterborough, designer,

“Do solemnly declare:

“(1) THAT I was employed as designer at the Auburn Woollen Mills Company of Peterborough in the month of August, 1914, and continued in such employ until January, 1916, and have personal knowledge of the matters herein-after deposed to.

“(2) All the overcoating made during that period by the said Auburn Woollen Mills Company for the Government contained, as I verily believe, about fifty per cent of shoddy and latterly to my knowledge increased to about sixty per cent.

“(3) In order to give the goods the appearance and handle of a well-felted cloth such as would be obtained from all wool stock, the said goods were from time to time treated in the finishing process with a stiffening agent composed of flour paste.

“(4) I voluntarily made the above statements to Mr. Burnham, M.P., on Monday, the 13th of March, 1916, and have since on my own account, under a sense of duty, laid the matter before Mr. H. W. Brown, Director of Contracts, in the Department of Militia and Defence, Ottawa.

“AND I MAKE this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of ‘THE CANADA EVIDENCE ACT.’

“Declared before me at the City }
of Peterborough in the County of }
Peterborough this eighteenth day of }
March, A.D. 1916. }

GEORGE GREAVES.

“R. M. Huddy,

“A Commissioner, etc.”

Greaves is a designer with an experience of thirty years. He was employed, as such, by the company in 1907 and discharged in January, 1916. The course of his duties brought him in contact with every process which lies between raw stock and the finished product.

The cause of his dismissal was want of designing work. The making of militia cloths displaced, practically in entirety, the previous different-patterned output of the mills.

It is the belief of Greaves, that his non-securement, later on, of a situation resulted from the unfavourable influence of President Kendry.

This belief, coupled with the preceding discharge, is said to have envenomed Greaves against the company. Spite, rather than the public interest, is suggested as having actuated the charges.

The cloth deliveries took place between February 8, 1915, and January 16, 1916. In this last month Greaves was discharged. Two months later—that is on March 18—he made the affidavit.

He was given opportunity to explain the delay. (Evidence, Vol. 3, p. 2257):—

“By Capt. Thompson:

“Q. Why did you not give information about this at an earlier date?

“A. This thing was done so openly from the first that I did not think there was any fraud and by and by, when I began to suspect fraud, I tried to get away from it.

“Q. When did you first begin to suspect fraud in it?

“A. Last November or December.

“Q. What made you begin to suspect fraud in November or December last?

“A. Well, seeing so much graft in other lines of industry.

“Q. In what other lines did you see there was graft?

“A. About binoculars and drugs.

“Q. Did that make you suspicious about the cloth?

“A. Yes, I thought it might be so in the woollen goods.

“Q. Why did you wait from November or December until the present time to give this information?

“A. Well, I tried to get away from it.

“Q. What do you mean by that?

“A. I applied for a situation.

“Q. With some company other than the Auburn Woollen Mills Company?

“A. Yes, sir.

“Q. And why did you finally decide to give information about the fraud, as you suggest?

“A. Well, I thought it was a duty I owed to give this information, in order to protect the Government.

“Q. Was that after you failed to get a situation some place else?

“A. Well, I was prevented from getting a situation.

“Q. By whom?

“A. Mr. James Kendry.

“Q. How do you know?

“A. He told me himself.

“Q. When?

“A. On the 7th of January.

“Q. 1916?

“A. 1916.

“Q. Did he say why he prevented you getting a situation?

“A. No, he did not.

“Q. Do you know why he prevented you getting one?

“A. I could not say why he should do it.

"Q. But he told you he had done so?

"A. Yes.

Evidence, vol. 3, p. 2262.

By Mr. O'Connell:

Q. And you knew from the time they commenced to use this shoddy that they were turning out weaker and inferior cloth?

"A. Yes.

"Q. From the time they commenced to use it?

"A. Yes.

"Q. So that you remained in the firm for about sixteen months after they commenced to use it, with full knowledge of the fact that they were using it, I suppose?

"A. I thought they had a license to use it.

By Mr. O'Connell:

"Q. Did you make inquiries to know whether they had a license to use that or not?

"A. No.

"Q. When did you discover they had not a license to use it?

"A. Well, I did not know till about last December.

"Q. You did not discover until last December that they did not have a license to use it?

"A. No, and I did not know even then.

"Q. What is it you did learn last December?

"A. Well, it entered into my mind—

"Q. Entered into your mind—what entered into your mind?

"A. That they had not a right to use it.

"Q. So that the first time it entered into your mind that they did not have any right to use it was in last December—is that right?

"A. Yes.

"Q. How do you explain that it was so long getting into your mind, after being there about fifteen months or more?

"A. Because they started from the first without any concealment.

Evidence, vol. 3, p. 2263.

By Mr. O'Connell:

"Q. How long did you remain with the firm after you had got a suspicion that they did not have the right to use it?

"A. I remained till the 7th of January.

"Q. About a month?

"A. Yes.

"Q. You remained with them about a month after you got the suspicion?

"A. Yes.

"Q. What did you do then after you got the suspicion, during the time you were with the firm? Did you make any complaint?

"A. I tried to get a situation and get away from them.

"Q. You tried to get a situation to get away from them?

"A. Yes.

"Q. So that we have it now, that after the first part of December you got a suspicion all this was wrong, and tried to get a situation and go elsewhere?

"A. Yes.

"Q. And until you left you made no complaint to anybody, did you?

"A. No.

These details are of small importance. They must not, however, be wholly ignored.

Even if resentment actuated the charges, they have none the less to be judged on their merits, as substantiated or otherwise, by the evidence.

In, possibly, marked degree Greaves is to be classed as other than an impartial witness. His testimony calls for close scrutiny. In matters of opinion, and other essential features, if there be any, supporting evidence is an equitable requirement.

As recital of the developed facts proceeds, the belief will become more and more emphatic that several leading features are quite free of controversy and that, as to others, the evidence is neither extensive nor complicated.

Eight successive orders for frieze were given to the mills.

As appears by the letters dated June 23, 1915, Exhibit No. 3, tenders for Frieze were invited.

I tabulate the orders with their dates; their prices; and the quantities delivered, with dates of deliveries:—

Date.	Number of yards.	Price.	Delivered.	Completed.
Feb. 8, 1915.....	35,000	\$1 55		
March 9, ".....	8,259	1 55	42,912½	April 6, 1915.
June 11, ".....	3,000	1 55	3,564½	Aug. 5, "
Sept. 17, ".....	20,000	1 75	20,837½	Nov. 29, "
Oct. 15, ".....	50,000	1 75	50,000	Dec. 28, "
Oct. 28, ".....	10,000	1 75	10,048½	Jan. 10, 1916.
Nov. 9, ".....	90,000	1 80	90,000	March 18, "
Jan. 1916.....	265,000	1 95	20,427	

The following technical expressions are found in the evidence. Definitions of them, in consecutive form, will be found of convenience:—

Warp.—Is the lengthwise thread or yarn.

Warp 19.—Means 19 threads per half inch.

Weft or woof.—Is the crosswise thread or yarn.

Weft 19.—Means 19 threads per half inch.

Warp 600 pounds.—Means that a piece of cloth 6½ inches by 9 inches cut lengthwise of the fabric will stand a weight strain of 600 pounds before breaking.

Weft 550 pounds.—Means that a piece of cloth 6½ inches by 9 inches cut crosswise of the fabric will stand a weight strain of 550 pounds before breaking.

Elasticity, warp, 2½ inches.—Means that a strip of the cloth when placed in the machine with the jaws 6½ inches apart is to stand a lengthwise stretch of 2½ inches before tearing.

Elasticity, weft, 2½ inches.—Means that a strip of cloth when placed in the machine with the jaws 6½ inches apart is to stand a crosswise stretch of 2½ inches before tearing.

Felting.—Is a thickening and partial cementing of the fibres by the application of steam. It makes the cloth firmer and gives it a finished appearance.

Fulling.—Is an alternative expression.

Long staple wool.—Comes from the back of the sheep.

Short staple wool.—Comes from other than the back of the sheep.

Wool stock.—Is wool shreded from clippings of new woollen cloth, (not old worn garments) and contains yarn of a shorter fibre than long staple wool.

Waste.—Is droppings from the cards.

Carding.—Means the combing out and blending of the woollen fibres by wire brushes set upon machines called cards.

Shoddy.—The evidence discloses differences of opinion as to the exact meaning of this expression. I deal with them later.

All the orders were based on sealed pattern No. 33 and its annexed specifications. This sealed pattern came from cloth manufactured by the Paton Company, of Sherbrooke, Quebec.

Its adoption, in 1912, was by a committee composed of Colonel Hallick, now director of stores, Charles Burns, assistant director of contracts and J. A. McCann, assistant director of contracts.

Saving the quantity and price, the communications which conveyed the orders were identical.

I invoke the first as an example:—

H.Q. 565-6-22

C.D. 397

A.B.

“DEPARTMENT OF MILITIA AND DEFENCE.

“OTTAWA, February 8, 1915.

“SIR,—I have the honour to request you to furnish to the Department of Militia and Defence the undermentioned articles at the prices stated:—

“35,000 yards Freize drab No. 33, at \$1.55 per yard, f.o.b. Ottawa. To be exactly similar in every respect to our Sealed Pattern and specifications therefor.

“It is to be understood and agreed that these goods are to be manufactured by your own operatives in your own premises.

“upon the following conditions:—

“1. The articles to be supplied under this order must be in all respects similar and equal to the Sealed Patterns and Specifications therefor.

“2. Delivery (or shipment) is to be made to Militia Inspection Room, 113 Rideau St., Ottawa, free of all charges, on or before March 20, 1915, not later.

“3. Freight or Express charges are to be prepaid; if chargeable to this Department the amount should be included in the invoice, to which a receipt from the Transportation Company for the amount paid must be attached.

“4. The invoice, in triplicate, and the shipping bill should be sent to Director of Contracts, Militia Department, Ottawa.

“5. Each article of the supply should be stamped with the manufacturer's name and the year of manufacture.

“Be good enough to inform me, by return mail, whether you accept the order upon these terms.

“I am, sir,

“Your obedient servant.

“H. W. BROWN,

“Director of Contracts.

“Auburn Woollen Company,
“Peterborough, Ont.”

The specifications referred to read as follows:—

Freize, Drab, for Great Coats and Cloaks. No. 33.

Dye—fast colour.
Width—58 inches.
Finish—as sealed pattern.
Weft—19.
Strength—Warp 600.
Strength—Weft 550.

Woven—plain.
Weight—32 to 33 oz. per yard.
Warp—19.
Elasticity—2½ inches Warp.
Elasticity—2½ inches Weft.

The specifications are silent as to the respective proportions of long staple wool, short staple wool and wool stock which may or must not be used in the manufacture of the stock. For general quality the sample governs.

The frieze delivered has not been subjected to criticism in other respects than that it contained fifty to sixty per cent of "shoddy," and that to give the goods manufactured the appearance of an all-wool stock, they were treated, in the finishing process, with a stiffening agent composed of flour paste.

Concerning these and other major features different witnesses were of different minds. It became desirable to secure an opinion, independent of local interests, on the quality of the frieze delivered as contrasted with the sealed sample and the specifications.

The assistance of Dr. Milton Hersey—eminent as an analyst and with experience in the technique of cloth manufacture—was secured.

For testing purposes Dr. Hersey was given possession of sealed pattern No. 33; of four samples of deliveries made, which are of record as Exhibits 5, 6, 7, and 8; and of the specifications.

To serve for his general, rather than restrictive, guidance I submitted to him the following queries:—

What are the proportions of long wool and wool stock or short wool in the sealed pattern?

What are the like proportions in the sample of cloth delivered?

Are these samples of like quality and texture as the sealed pattern?

The elaborate report, signed by the "Milton Hersey Co., Ltd." and by Chas. R. Hazen, its vice-president, reads thus (the words in parenthesis are added by me by way of explanation:—

THE AUBURN WOOLLEN MILLS COMPANY,

MONTREAL, May 1, 1916.

Samples khaki frieze

34575 Sample marked No. 33 Militia Department.

34576 " " " 5

34577 " " " 6

34578 " " " 7

34579 " " " 8

Hon. Sir CHARLES DAVIDSON,
Ritz-Carlton Hotel,
Montreal.

DEAR SIR,—We have made a careful examination of the samples of khaki frieze which you recently submitted. The results of our examination are shown in the following tables:—

MECHANICAL ANALYSIS.

i.e. (Separation and measurement by hand of the various fabrics in the cloth.)

Lab. No.	Warp Fibres.		Weft Fibres.	
	Under 14"	Over 14"	Under 14"	Over 14"
34575.....	71.2	28.8	67.8	32.2
34576.....	80.3	19.2	89.0	11.0
34577.....	77.2	22.8	85.7	14.3
34578.....	88.7	11.3	88.9	11.1
34579.....	90.2	9.8	90.0	10.0

WAR SUPPLIES PURCHASES

COTTON IN FABRIC

34575.....	215 p.e.
34576.....	85
34577.....	90
34578.....	80
34579.....	130

YARNS PER INCH.

	Warp.	Weft.
34575.....	32	32
34576.....	25	27
34577.....	25	27
34578.....	26	28
34579.....	25	28

In neither the standard sample or the cloth supplied does the count correspond with the specification requirements of nineteen ends per inch.

TENSILE STRENGTH PER 1 INCH.

Lab. No.	Direction.	1st (Test)	2nd (Test)	Average.
34576	Warp.	67	64	66 lbs.
	Woof.	60	64	62 "
34577	Warp.	53	52	53 "
	Woof.	50	51	51 "
34579	Warp.	52	50	51 "
	Woof.	51	48	50 "

EQUAL TO TENSILE STRENGTH OF 9 INCHES.

Lab. No.	Direction.	1st (Test)	2nd (Test)	Average.
34576	Warp.	603	576	589 lbs.
	Weft.	540	576	558 "
34577	Warp.	477	468	472 "
	Weft.	450	459	455 "
34579	Warp.	450	468	459 "
	Weft.	441	459	450 "

The tensile strength of the cloth in samples Nos. 6 and 8 is not equal to the requirements of the Government specification. We were unable to determine the tensile strength of the standard sample and of sample No. 7 because they were too small.

In our opinion attention should be given to tensile strength only in connection with the examination of the yarn used and of the fibre composing the yarn, as the tensile strength is not dependent only upon the grade or quality

of the wool used but also upon the amount of twist put in the yarn, and the treatment it has received in the process of manufacture.

It is well known that the tensile strength may be increased by merely putting additional twist in the yarn.

It is impossible to determine the relative amounts of new wool and of wool stock used in making these cloths, as the wool stock used is made from tailors' cuttings of new and unworn cloth. In our opinion it is not essential what proportions are used so long as the resulting fabric contains as long and as good a fibre as does the standard which it is made to match. In other words, it makes no difference whether a given wool fibre comes from new wool or from wool stock, so long as it is equally good in quality and length. This involves the necessity of using a high grade wool stock made from new rags, and we have been unable to detect the presence of any low grade wool stock or shoddy in any of the samples.

The length of the fibre found in the yarn is an indication of the quality of the cloth, the longer the fibre the better the cloth, while cloth with short fibre is correspondingly inferior. In these friezes there is a noticeable difference in the length of the fibre. The standard sample is better in this respect than any of the deliveries we examined. The low percentage of long fibre and the corresponding amount of short fibre shows the comparative inferiority of the cloth delivered compared with the standard. This inferiority while not great, is indicated further by the higher amount of cotton fibre and by the low tensile strength.

The cotton fibre in the samples is too low to have any material effect upon the quality of the cloth in any case, but shows that a greater amount of, or a slightly lower grade of wool stock has been used in making it.

Yours truly,

MILTON HERSEY CO., LTD.,

CHAS. R. HAZEN,
Vice-President.

Dr. Hersey attended at Ottawa without compensation, and gave testimony. I acknowledge, with appreciation, the marked and valuable aid rendered to the Commission, as well by him as by Mr. Hazen.

The report gives the requirements of the specifications analytical and full consideration.

Mr. O'Connell accepted the report, on the occasion of its presentation.

None the less, necessity existed to have its tabulated statements and other technical details made clearer to the inexperienced, by the personal testimony of Dr. Hersey.

One incidental feature had best be disposed of at once. Cotton is found in the delivery samples, Exhibits 5, 6, 7, and 8. Its presence was not intentional. Possibly stitchings in the khaki clippings, from which the short wool was developed, account for its presence. The sealed pattern No. 33 also contains traces of cotton, no doubt from a like cause. Cotton is not found in either long or short staple wool cloth.

The existant proportions are found by the report to be:—

Sealed Pattern No. 33	0.215 per cent.
Delivery Sample No. 5	0.85 "
" " No. 6	0.90 "
" " No. 7	0.80 "
" " No. 8	1.30 "

But "the cotton fibre in the samples is too low to have any material effect upon the quality of the stock," and Dr. Hersey declares that it would be hair splitting to do other than disregard its presence. The increase of one-fifth of one per cent to one and one-third per cent shows, however, a progressively larger proportion or a slightly lower quality of short wool.

Resultingly of the fact that the frieze is of one substance—that is all wool—comes the impossibility of determining by any chemical test the ratio, as between one and the other, of long staple and short wool produced from khaki clippings.

Only by actual count—by “mechanical analysis,” as the expert designates the process of manual dissection, can even the relative lengths of the component parts be determined.

This treatment does not break the wools, but the shredding of the clippings and the fulling does, to some extent.

Dr. Hersey puts the division line between long and short wool at one and one-quarter inches.

Arithmetical dissection, of the kinds described, determined, in fair measure, the relative lengths of the wools. It is not, obviously, practicable as a commercial method. Especially is this the case when deliveries are in huge quantities; of different classes of cloths; and from many sources.

How, then, can this factor, representing the sources and relative proportions of the wool be learned with certainty, intensive or qualified?

Instinctively we turn to the blending room, as a place of information. For here are laid out the component wools, which are to constitute the finished product. But having regard to the facts that the work of supplying the basic material is continuous; that hundreds of supplying factories are scattered throughout the country; and that the requirements of the military forces are diversified and enormous; it would not be feasible to keep an inspector on guard in this room.

Such intensive supervision would, if made a departmental regulation, involve an expense of startling proportions.

Other effective means, of practically sufficient efficiency, are available.

Standard quality, as called for by scaled sample and specifications, is assured if the deliveries in regard to general quality, manufacture and finish, are vigilantly examined by men of technical experience and if, in addition, they stand the stipulated requirements as to texture, weight, dimensions, and strength.

So far as securable, inspectors were employed:

In the case of the Auburn Woollen Mills, W. E. Orr acted as local government inspector. His appointment dated from March 8, 1915. To keep the output up to sample and specifications were his guiding instructions. He asserts that the frieze turned out was, saving such as he rejected for imperfections in colour, up to requirements. I am unable to commend his performance of the duties intrusted to him. He seems to have kept the fact that the goods would receive final inspection at Ottawa in constant remembrance. Information fairly to be expected from him was not obtainable.

At the mills the proportions of wool and wool stock which enter into the frieze are weighed. Records are kept. In 1915, Walter Anderson, foreman of the mixing and picking room received orders to make the proportion 60 per cent staple wool and 40 per cent wool stock.

About the beginning of November he was told to put in fifty to fifty. Efforts to do so resulted in an off colour. To obtain the right shade a blend of 52 or 53 to 50 was adopted.

Let it be said, at once, that resultants in the manufactured cloth show a larger difference in favour of staple wool. In the carding, spinning, and scouring processes staple wool loses proximately only five, and wool stock fifteen to twenty per cent from the expression of oil.

The blending books were produced. Mr. Thompson adopted certain entries, out of many, as representing averages up to the time when Anderson was instructed to increase the quantity.

I tabulated the entries, meanwhile explaining that the expression “garnetted waste” represents fragments left on the machine after the yarn is torn off the shuttles. It is salvaged, being equal in quality to the wool stock, and calculated as such:—

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FEBRUARY, 5, 1915.

Staple Wool.	Wool stock and Garnetted waste.	Percentages.
lbs. 873	lbs. 825	55 to 45

FEBRUARY, 9, 1915.

Staple Wool.	Wool stock and Garnetted waste.	Percentages.
lbs. 977	lbs. 875	50 to 50

MARCH 12, 1915.

Staple Wool.	Wool Stock.	Garnetted Waste.	Percentages.
lbs. 638	lbs. 360	lbs. 100	60 to 40

MARCH 29, 1915.

Staple Wool.	Wool Stock.	Garnetted Waste.	Percentages.
lbs. 1177	lbs. 720	lbs. 300	55 to 45

The succeeding stages are these:—

The wools are put through the picker.

The wools are put through the carding machine which straightens out the fibre.

The wools are spun into yarn.

The yarn is dyed.

The yarn is worked into cloth.

The cloth is fulled or felted.

The "mechanical analysis" of Dr. Hersey shows wider gaps between the ratios of long and short wool based on measurements, than do the figures in the blending book, based on stock classification.

As already stated, his figures simply fix the proportions of long and short wool, which stand above and below the arbitrary dividing line of one and one-quarter inches. It might be that some of the staple wool fell, as regards length, into the lower class.

This method of classification accentuates the proportion of short wool, and, according to Mr. Burns, in material degree.

In the scaled pattern No. 33, short warp and weft fibres also outnumber those over one and one-quarter inches.

The expression "shoddy" is of frequent occurrence throughout the evidence. So, also, is "short wool." Concerning the latter there is no doubt. It is not a misnomer. The shredding and treatment of all wool garments or clippings produces short wool.

Popular belief, in which I was a sharer, now ranks "shoddy" cloth, as a flimsy material composed of worn rags or other jettisoned waste, whether wool or cotton.

According to reliable definitions the word originally had a more reputable meaning. It was applied to cloth which included fresh wool, wool clippings, and the wool waste thrown off during the process of manufacture.

The New Dictionary asserts that "upon the whole the cheap and nasty idea associated with the term 'shoddy' is quite a mistake. Some most excellent cloths are produced."

That manufacturers should, in their desire to escape from the opprobrious features which have, more and more, come, in many relations of life, to be attached to the word "shoddy," adopt the expression "short wool" or "wool stock" is understandable.

The subject does not deserve further pursuit. It is the actual quality of the goods supplied, having regard to sealed pattern and specifications, and not popular on manufacturing terminology, which excites my concern.

Exhibit No. 9 was put of record by inadvertence. It consists of a five paged draft of specifications for serges, frieze and cloth, which the Department had under consideration; they do not relate to Auburn mills deliveries.

Had the Auburn Mills to Deliver an all Staple wool Frieze?

The answer is in the negative and for these reasons.

The sealed pattern No. 33 is not all staple wool; it contains short wool.

The prices represent a mixture. An all staple wool frieze would have cost from 75 cents to \$1 a yard more.

Assistant Director of Contracts Burns states that, by actual test, the Canadian sealed pattern goods are ahead of the British War Office cloth.

As between khaki, used for tunics and trousers on the one hand, and frieze on the other, there are several contrasts.

The one is lighter in weight, softer in texture, and must, according to departmental requirements, consist, wholly, of staple wools. The other is heavier, harsher, more closely woven and of different construction.

There is evidence, worthy of respect, which asserts that for frieze a mixture of long staple and short wool is preferable. The presence of the latter adds to the tenseness and toughness of the cloth. It is needed for felting purposes.

How do Deliveries Compare with Sealed Pattern No. 33 and Specifications?

The witnesses who have spoken on the question of quality may be thus classified:—

1. George H. Greaves, who laid the accusing affidavit.
2. George H. Smith, vendor of wools to the mills.
3. Officials Past and Present of the Mills:—

James Kendry, President.

Miss Miller, Book-keeper.

Walter Anderson, Foreman of picking and blending room.

George Baird, dyer of company up to October, 1915.

John Bentley, late manager.

William Hartley, superintendent.

4. Officials of the Militia Department.

Robert Watson, government inspector of woollen supplies.

Charles Ferrill, inspector of clothing, Militia Department.

Charles Burns, assistant director of contracts, Militia Department.

William E. Orr, local inspector, Militia Department.

5. Disconnected witnesses.

Dr. Milton Hersey, analyst; called by Commission.

A. Baxandale, experienced in clothing business; called by Commission.

R. S. Bartlett, cloth manufacturer; called by the company.

Neither jointly nor severally do No. 33 and the specifications call for an all staple wool Frieze. In this respect it is the standard of No. 33, which governs.

There was neither concealment nor ignorance of the fact that the deliveries contained wool stock.

Hence the residuary issue, on this feature of the investigation, is as to the relative proportions of staple wool and of wool stock which existed in the deliveries.

Greaves's testimony is to the effect:—

Judging by the samples of actual deliveries, Exhibits 5, 6 and 7, there was 50 per cent of short wool; and No. 8 is styled by him "the poorest one in the bunch." His opinion is that the sealed pattern contains no shoddy—a wholly erroneous belief.

Smith, the vendor of the wool stock:—

Considers it might, if of high grade, be used up to 40 per cent.

Baird, the company's dyer up to 15th October, 1915:—

His duty was to dye the wool yarn and pieces of cloth into the blend. He places the averages at 45 per cent of wool stock and 55 per cent of staple wool; and considers the sealed pattern No. 33 of possibly better quality than the samples Nos. 5, 6, 7, and 8, of which No. 7 seems to be the poorest.

Hartley, superintendent of the mills:—

Makes the statement that the general run was 60 per cent of wool and 40 per cent of wool stock.

President Kendry:—

Considers their cloth to be better than the sealed pattern.

Bartlett, a woollen manufacturer of Burlington, Vermont:—

Is of opinion that in relation to the sealed pattern, the samples of deliveries Nos. 5, 6, 7, and 8 represent good deliveries; and that with good quality of stock, 50 to 50 would produce a cloth equal to that called for.

Watson, Government inspector of woollen supplies for North West Mounted Police:—

Considers the mills product to be good frieze; serviceable; 20 per cent of short wool would mean an ideal cloth. He considers 25 per cent excessive. As to the samples, his belief is that No. 5 is up to standard; that No. 6 is so also, but with a larger proportion of wool stock; Nos. 7 and 8 equal No. 5.

Ferrill, Militia Inspector of Clothing:—

There was, possibly, more wool stock in the delivery of which No. 8 is a sample than in the sealed pattern; but it stood the strength test. He would accept up to 40, but not more. One thousand yards were rejected for imperfections in dye.

Burns, assistant director of Contracts:—

Does not think it possible to follow the specifications too rigidly; to do so would block supply of material; acting on this principle, he would allow a margin of 15 per cent on tensile strength, and one ounce per yard in weight, before rejecting. But he would call the manufacturers attention to such defaults. His tests are for tensile strength, weight, and finish. One piece out of every six or seven is weighed. Within the margin so allowed the Auburn Mills products came up to sample in essential features. There has not been a single complaint of our cloth as far as he is aware.

The same width cannot always be produced in the felting. The more it is felted, the more threads to the inch. Thousands of yards of material are received every day.

Burns, on the morning of his examination, subjected a sample found in the office, which may or may not be Auburn Mills product, to six experimental inch-strength tests. These were applied at different places on the sample. They showed a variation of 13 pounds. The tests were made to verify the practice of allowing a margin. If the width falls short of requirements, by even up to five-tenths of an inch the attention of the maker is called to the fact.

Considers the goods were up to sample. The yarns are broken in the manufacturing processes and by the interlacing produced by the felting. If the goods were 15 per cent inferior in quality and value he would not be justified in accepting them.

As regards the number of threads per inch, they must have been heavier to get the weight.

This summary of the evidence given by the different classes of witnesses, will prove of material assistance in elucidating its points of agreement or of contrast with the Report and the evidence of Dr. Hersey.

Elimination of a number of features, which have had mention, but stand free of controversy, is possible.

I proceed to effect it:—

In his affidavit Greaves charges that the frieze was from 50 to 60 per cent "shoddy," and that to give the cloth a good, well-felted appearance, flour paste was used.

In his evidence he admits, as were the facts, that fastness of colour, width and weight were up to requirements.

And he further states:—

"Q. So that the only cause of complaint you have is that they have been using this fifty per cent of what you call 'shoddy'?"

"A. Yes."

That the cloth was drab frieze for great coats and cloaks; to be finished according to sealed pattern; and to be woven plain—all items of the specifications—may, also, drop out of sight. These conditions were complied with and are not in dispute.

As regards the specifications there remain for further observation:—

1. The number of threads per inch of warp and woof.
2. The tensile strength per 9 inches of warp and woof.
3. The elasticity per warp and woof.

And as relating to the sealed pattern.

4. The relative proportions of staple and wool stock.

In law, as in business, the expert, although often sought for, excites a criticism not less keen than is the criticism he deals out to others. This divergence finds expression as between the lawyer and the doctor in insanity cases; as between the officer who tests shells and the makers; and, as in this case, between the man who tears cloth into threads and its manufacturer.

Hence the methods and some of the results of the Hersey report have not escaped adverse judgment.

It is matter of equitable admission that an analyst pursues his investigation and reaches results with an exactitude which is not possible of full imitation in business operations, and especially if these be of extensive, varied, and insistent character.

Even with proper allowance for this divergence between theory—based on alleged supercritical tests—and business methods there is, according to the Report and Dr. Hersey's supporting evidence, a noticeable shortage of quality in the deliveries.

His tables show:—

1. As regards proportions of long and short wool a considerably larger proportion of the latter.

2. As regards cotton in fabric a negligible quantity.
3. As regards yarns per inch a fewer number than in the sealed pattern.
4. As regards tensile strength a less extent than in the sealed pattern.

Concerning the first table, its results deserve to be qualified by the fact that processes of manufacture and of "mechanical analysis" do, to some extent, break long wool into shorter length. But this fact applies to the sealed pattern no less than to the samples. It was subjected to the same mechanical analysis. The important fact results that if in the case of the samples the process exaggerates the proportion of short wool, originally blended, the like exaggeration attaches to the sealed pattern figures. There is, therefore, compensation of comparisons and of results.

Concerning the second table, it is a negligible factor.

Concerning the third table, it is stated that the yarns used must have been larger than in the sealed pattern, otherwise the weights would have fallen short. Two, perhaps three, witnesses have sworn to this effect. I do not feel able to hold to the contrary.

Concerning the fourth table, I am left with the belief that a tensile test made, as these were, on a one-inch machine, is, when multiplied by nine, reasonably comparable with the results of a like test of the same cloth on the department's nine-inch Goodbrand and Holland machine—a machine which, it may be stated, is the kind employed in the British War Office.

In development of its tables the report, among other remarks, adds these:—

"It is impossible to determine the relative amounts of new wool and of wool stock used in making these cloths, as the wool stock used is made from tailors' cuttings of new and unworn cloth. In our opinion it is not essential what proportions are used so long as the resulting fabric contains as long and as good a fibre as does the standard which it is made to match. In other words, it makes no difference whether a given wool fibre comes from new wool or from wool stock so long as it is equally good in quality and length. This involves the necessity of using a high grade wool stock made from new rags, and we have been unable to detect the presence of any low grade wool stock or shoddy in any of the samples.

"The length of the fibre found in the yarn is an indication of the quality of the cloth, the longer the fibre the better the cloth, while cloth with short fibre is correspondingly inferior. In these Frieze there is a noticeable difference in the length of the fibre. The standard sample is better in this respect than any of the deliveries we examined. The low percentage of long fibre and the corresponding amount of short fibre shows the comparative inferiority of the cloth delivered compared with the standard. This inferiority, while not great, is indicated further by the higher amount of cotton fibre and by the low tensile strength."

By his evidence, Dr. Hersey invests these general statements with numerical definitions.

He puts the difference in quality at 15 per cent, with a concurrent equal diminishment in value.

It is asserted, to the contrary, that even if there were 15 per cent of inferiority in material and sparseness of construction, the shrinkage in value would not, as a certain result, be also 15 per cent, because cost of manufacture and overhead expenses need appreciation.

Allowance of a few points in favour of this view does not materially affect Dr. Hersey's opinion.

Mr. O'Connell, of counsel for the company, admits, with a qualification, the correctness of the report. It is desirable to quote from the evidence, (vol. 3, p. 2372):—

"Sir CHARLES DAVIDSON: Will you, Mr. O'Connell accept that report from the experts of the Milton Hersey Company as being consistent with the facts?"

Mr. O'CONNELL: Yes.

"Sir CHARLES DAVIDSON: I have had a long interview with this expert and he seems to have made an explanation of the result of the analysis.

"Mr. O'CONNELL: It will not require any witnesses to be called.

Evidence, vol. 3, p. 2374.

"Sir CHARLES DAVIDSON: I had a personal conversation with him and he told me that the goods were five to ten per cent lower in quality than the sealed sample. Have you any evidence? We could get Mr. Hazen here.

"Mr. O'CONNELL: I have not quite had an opportunity to consider that interview or whether it may be necessary to have Mr. Hazen here to have an explanation of it, but as far as I gather from the report at the present time I do not think it 'materially affects the question in issue.'

"Sir CHARLES DAVIDSON: Mr. Hazen's belief is that the tensile strength in itself does not come up to the possible requirements.

"Mr. O'CONNELL: I think there was another test and that is as to the elasticity. There are tests which are provided by the department and which have been followed in addition to the test of tensile strength. The way the matter presents itself to me is this, that the contract between the Government and the company is based upon letters soliciting tenders which were sent by the Government to the different manufacturers, and it is stated there that the quality of the cloth to be supplied must be equal in all respects to the standard of the department.

"Sir CHARLES DAVIDSON: To the sealed sample?

"Mr. O'CONNELL: Yes, to the sealed sample. It is to be observed in connection with that, that that is the basis of the tender and contract and nothing else can control it. There is nothing said about a specification. There was a specification prepared afterwards but it did not enter into this contract at all. All that the contractor was required to do was to supply goods of the quality of the sealed sample.

"Sir CHARLES DAVIDSON: That would content me if you had done it.

"Mr. O'CONNELL: The question is whether we have done that. Apparently the experts of the Department submitted the cloth that had been sent them from time to time to the tests with which they are familiar and all these experts of the Department not only said that the cloth supplied by our company was fully up to the standard of the sealed sample, but they were rather enthusiastic in their praise of the quality of the goods supplied by this company. Perhaps the word 'enthusiastic' may be a somewhat exaggerated form of expression, but they all thought highly of the quality of the goods. It is to be observed in connection with that, that all the manufacturer can see is the sample. He does not take and analyze it; he simply goes to the Department, examines it and he does not determine in that way the precise quantity of wool stock or anything else in it. But from this ordinary inspection, he has to prepare a class of goods equal to it. If he does that, and if it goes through the test of the Department, I submit that he fulfils the terms of the contract. I think that has been done in this case. While the report may say that perhaps there may be a little more wool stock in the sample supplied by the company, or it may in some other respect differ slightly from the standard, yet it is substantially within the terms of the contract. Upon the whole; having regard to the inspection that the company made of the sealed sample, and the quality of the goods they supplied, I think that in all respects they have fulfilled the terms of their contract. It is said by the expert, whose report has been read,—I think it is rather more inferential than anything else,—that the wool stock is of a high grade, but after all, the question to be determined is not whether there is more or less wool stock, or what they commonly call shoddy in it or not, but it is whether the cloth is up to the standard."

"Capt. THOMPSON: They say that the tensile strength is not up to the standard."

Mr. O'Connell falls into voluntary error when stating that the sealed pattern alone governs. Express mention of the specifications is found in the purchase orders.

I found on analysing the evidence that some points needed explanation. Two further meetings of the Commission, were, as a consequence, held. Mr. Hutcheson called President Kendry and Dr. Hersey to the box. The company examined Bartlett, of Burlington, Vermont, U.S.A., as an expert. Summaries of their testimony appear on preceding pages.

Two further points—the use of flour paste and the prices—need attention, ere I proceed to a statement of my conclusions.

The use of flour paste.

In his affidavit Greaves charges that flour paste was used in the finishing process, "in order," he says, "to give the goods the appearance and handle of a well felted cloth such as could be obtained from all wool stock."

A very small quantity, about an ounce per yard was used. It is of service for shrinking and waterproofing; is not, in this modest quantity, injurious to the cloth; and is not observable by inspection.

The Price.

The first order, bearing date February 8, 1915, was placed at \$1.55 per yard; and the last, in January, 1916, at \$1.95.

The increases were as follows:—

February, March and June, 1915, 3 orders.....	\$1 55 per yard.
September and October, 1915, 3 orders.....	1 75 "
November, 1915, 1 order.....	1 80 "
January, 1916, 1 order.....	1 95 "

In this interval the price of wool stock had increased to 31 cents from 25 cents and staple wool from 50 or 55 cents to 70 cents.

There were cost expansions in other directions.

It was not charged during the investigation, that the prices allowed, for a frieze up to sealed pattern No. 33 and the specifications, were excessive. Nor did any information to the contrary reach us.

Vol. 7, Kendry, pp. 297, 300.

President Kendry testified that, at the date of his examination, the frieze output cost \$1.88 per yard, and that their prices to the Government were lower than to the trades, and less profitable. His mills have been government contractors since 1885.

Conclusions.

I beg, with all respect, to submit the following findings, on the entire case:—

1. Even if resentment actuated the charges, they have, none the less to be judged on their merits as substantiated, or otherwise, by the evidence. However, in matters of opinion and other essential features, if there be any, supporting evidence is an equitable requirement.

2. *Cotton*.—There are traces of cotton in the sealed pattern. It is also found in the delivery samples, Exhibits 5, 6, 7, and 8, but so sparsely that its presence can be disregarded.

3. *Flour paste*.—Only about one ounce per yard was used. It helps to shrink and waterproof the cloth. In modest quantity, it is allowable and is not observable by inspection.

4. *Price*.—For a frieze up to the standard of the sealed pattern and annexed specifications, the original and progressively expanded prices, sanctioned by the War Purchasing Commission, were not excessive.

5. *The specifications*.—May be regarded as explanatory of the sealed pattern. They express its physical qualities.

6. *The sealed pattern No. 33*.—Is not all staple wool; it contains a substantial proportion of short wool, otherwise wool stock.

7. *Deliveries*.—The deliveries of the Auburn Woollen Mills Company, while of good wearing qualities and not complained of under service conditions, fluctuated upwards, in sensible degree, as regards the proportion of wool stock. To the mills these increases in the volume of wool stock lessened the basic cost per yard; and to the public lessened the quality and money value of the material. A substantial weight of evidence lies in favour of the belief that the deliveries fell short of the sealed pattern and specifications.

8. The fluctuations in relative proportions of staple wool and wool stocks are difficult, indeed if not highly exaggerated, impossible, of detection by the departmental officers, without whose knowledge and acquiescence they should not be made.

9. Inevitable variations occur in the manufacture of cloths; they exist even in the same piece. With faithful officials, a latitude, based on sound discretion, is not reprehensible.

10. But the exercise of this latitude should have recognition on the face of the documents.

11. In the present case the orders specifically set forth that the frieze was "to be exactly similar in every respect to our sealed pattern and specifications therefor."

12. It is advisable that this rigid language should be assuaged in favour of a definitized margin of variation.

13. I suggest that the practicability of stipulating for a named minimum of long staple wool and maximum of wool stock, be given consideration.

14. *Charles Burns*, Assistant Director of Contracts, was in the box on six different occasions during the investigation and subjected to exhaustive examination. The inspecting staff and the acceptance or non-acceptance of khaki frieze, and possibly other classes of cloths are under his immediate supervision. He impressed me as being a zealous, conscientious officer, who sought to perform his duties—present abnormal as to extent and pressure—with patriotic efficiency.

The exhibits filed are transmitted herewith.

C. P. DAVIDSON, Kt.

Commissioner.

APPENDIX.

OTTAWA, February 3, 1916.

SIR CHARLES PEERS DAVIDSON, K.C.M.G.

Commissioner appointed by Royal Commission.

SIR,—I hereby make application to appear on behalf of the Auburn Woollen Mills upon the inquiry to be held in respect of the quality of cloth supplied by the above-mentioned mills to the Militia Department.

I have the honour to remain,
Your obedient servant,

D. O'CONNELL,
Solicitor,
Peterborough.

Granted.

EXHIBITS.

1. Affidavit of Greaves.
2. This number missed by inadvertence.
3. Letter dated June 23, 1915, inviting tenders for frieze, with annexed form of tender.
4. (Page A) Original order for 35,000 yards, February 8, 1915.
(Page B) Copy of order for 35,000 yards, February 8, 1915.
(Page C) Copy of order for 8,250 yards, March 9, 1915.
(Page D) Copy of order for 3,000 yards, June 11, 1915.
(Page E) Copy of order for 475 yards, July 31, 1915.
(This is to cover deliveries in excess of orders.)
(Page F) Copy of order for 20,000 yards, September 17, 1915.
(Page G) Copy of order for 50,000 yards, October 16, 1915.
(Page H) Copy of order for 10,000 yards, October 28, 1915.
(Page I) Copy of order for 90,000 yards, November 9, 1915.
(Page J) Copy of order for 265,000 yards, January 19, 1916.
- 4A Sample of yarn from mills.
5. Sample of frieze delivered.
6. Sample of frieze delivered.
7. Sample of frieze delivered.
8. Sample of frieze delivered.
9. Specifications drafted for consideration; but not ratified.
10. Sample of frieze delivered and subjected to a number of tensile tests.
11. Report of Dr. Hersey.

EXHIBIT No. 1.

Dominion of Canada
Province of Ontario
County of Peterborough.

To wit: { IN THE MATTER OF a certain Contract between the Auburn Woollen Mills Company of Peterborough for the supply of overcoating by the Auburn Woollen Mills Company to the Government of Canada.

I, George Greaves, of the city of Peterborough, in the county of Peterborough, designer, do solemnly declare that:—

(1) That I was employed as designer at the Auburn Woollen Mills Company of Peterborough in the month of August, 1914, and continued in such employ until January, 1916, and have personal knowledge of the matters hereinafter deposed to.

(2) All the overcoating made during that period by the said Auburn Woollen Mills Company for the Government contained, as I verily believe, about fifty per cent of shoddy and latterly to my knowledge increased to about sixty per cent.

(3) In order to give the goods the appearance and handle of a well-felted cloth such as would be obtained from all wool stock the said goods were from time to time treated in the finishing process with a stiffening agent composed of a flour paste.

(4) I voluntarily made the above statements to Mr. Burnham, M.P., on Monday, the 13th of March, 1916, and have since on my own account under a sense of duty laid the matter before Mr. H. W. Brown, Director of Contracts, in the Department of Militia and Defence, Ottawa.

And I make this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of "The Canada Evidence Act."

Declared before me at the City of Peterborough in the County of Peterborough this } (Sgd.) GEORGE GREAVES.
eighteenth day of March, A.D., 1916.

(Sgd.) R. RUDDY,
A Commissioner, etc.

EXHIBIT No. 2.

This number was inadvertently slipped.

EXHIBIT No. 3.

Exhibit No. 3, page 2, letter accompanying form of tender.

C. D. 117.
H. Q. 565-6-4-A.
C. D. 116.
H. Q. No. 565-6-5-A.

DEPARTMENT OF MILITIA AND DEFENCE,

OTTAWA, June 23, 1915.

AUBURN WOOLLEN MILLS COMPANY.

SIR,—Tenders are being invited for the supply to this Department of Frieze, Drab, No. 33, as specified in the accompanying forms of tender. If you wish to quote for these supplies, please sign two forms and mail them in time to be received in this

Department on or before noon of Friday the 2nd July. You may retain the duplicate form for future reference.

Your tender should be enclosed in a sealed envelope, addressed "Director of Contracts, Department of Militia and Defence, Ottawa," and the envelope marked "Tender for Frieze, Drab, No. 33."

Delivery of these supplies is required not later than

Payment therefor will be made from the appropriations of 19

I am, sir,

Your obedient servant,

CHAS. BURNS,

A. D. of C. for Director of Contracts.

The Auburn Woollen Co.,
Peterborough, Ont.

H.Q. 565-6-5-A.

H.Q. 565-6-4-A.

C.B.

C.D. 117.

C.D. 116.

Exhibit 3 (2) page 2.

This tender should be mailed by registered letter in time to be received at the Department of Militia and Defence, Ottawa, by or before 10 o'clock noon, on Friday the second day of July, 1915. It should be addressed to the Minister of Militia and Defence and the envelope marked "Tender for Frieze, Drab, No. 33."

TENDER FOR MILITIA STORES, ETC.

CLOTHING, NECESSARIES, BARRACK STORES AND CAMP EQUIPMENT.

PETERBOROUGH, ONT., June 28, 1915.

Exhibit No. 3, Formal Tender Auburn Woollen Mills.

SIR,—Auburn Woollen Company hereby offer to supply to His Majesty the King, represented by the Minister Militia and Defence of Canada, hereinafter called "the Minister," the articles mentioned in the schedule given below, and to deliver the same at the Militia Inspection-Room, at Ottawa, at the times and for the prices placed opposite the respective articles.

In the event of this tender being accepted, as to the supply of any one or more articles we agree to the following:—

1. That we furnish an accepted cheque on a Canadian chartered bank for an amount equal to ten per cent of the total value of the articles to be contracted for, and execute such formal contract as may be required by the said Minister, and we hereby agree, in the event of being notified of the acceptance of this tender for one or more of the articles tendered for, that we will consider this tender as binding on us as a formal contract.

2. That each article shall be similar and fully equal in every respect to the sealed pattern thereof in possession of the Minister, and shall be subject to rejection if not judged by the Minister, or by the officer thereto authorized by the Minister, to be in accordance with the said pattern. (See note below.)

3. That if any of the articles mentioned in the schedule are required of assorted sizes we shall furnish them of such sizes, and in such quantities of each size, as may be determined upon by the Minister.

4. The freight charges from place of shipment to Ottawa shall be at our expense and paid by us before shipment.

5. That the packing cases, bales, etc., in which the articles are shipped, shall become the property of His Majesty, without charge.

6. That if at any time, during the present contract, additional quantity of any of the articles contracted for be ordered from us by the Minister or by the officer duly

authorized in that behalf, such order will be considered as forming part of the said contract and shall be subject to the same prices and conditions.

7. That the said contract, pursuant to the statute in that behalf, shall be subject to the express condition that no member of the House of Commons of Canada shall be admitted to any share or part of such contract, or to any benefit to arise therefrom.

8. WITH A VIEW TO SUPPRESSING THE SWEATING SYSTEM and securing payment of fair wages to the workmen, and the performance of the work under proper sanitary conditions, this contract shall be subject to the following regulations, and strict compliance with the true spirit and intent of the various provisions herein contained is required:—

a. All articles included in this contract shall be made up in the Contractor's own factory, and no portion of the work of making up such articles shall be done at the houses of the work people. The contract shall not, nor shall any portion thereof, be transferred without the written permission of the Minister, and the sub-letting of the contract or of any of the work to be performed under the contract, other than that which may be customary in the trades concerned, is hereby prohibited. Any infringement of the provisions of this clause, or any of them, if proved to the satisfaction of the Governor in Council, shall render the Contractor liable to a forfeiture not exceeding five hundred dollars for each offence, which may be deducted from any moneys payable to him under this contract.

b. If the Contractor violates the conditions herein mentioned against sub-letting, he shall not be entitled to receive any payment under the contract for work done by the sub-contractor, and the Minister may refuse to accept any work performed by a sub-contractor in violation of the prohibition herein contained against sub-letting.

c. The factory, and the work there being performed under this contract, shall at all reasonable times be open to inspection by persons therefor authorized in writing by the Minister.

d. The Contractor shall be required, when submitting his tender, to make a statement on the form printed below, setting forth the minimum rates of wages to be paid to, and the maximum number of hours to be worked by, the different classes of labour to be employed in the execution of this contract, the said wages and hours to be subject to the approval of the Department of Labour.

e. Before being entitled to payments of any moneys which the Contractor may from time to time claim to be due him under this contract, he shall file with the Minister, in support of such claim, a solemn statutory declaration of himself or of such other person or persons as the Minister may indicate, testifying to the rates of wages paid in execution of this contract, and to the manner in all other respects in which the provisions of this contract have been observed and the work performed, and generally setting forth such information as the Minister may require, and as will enable him to determine whether, and if so, in what respects, any of the provisions of this contract may have been violated. If a violation has occurred the Minister may cancel the contract and refuse to accept any work done thereunder, and the Contractor will thereafter not be allowed to undertake any work for the Department of Militia and Defence.

f. If the Contractor fails at any time in paying the salaries or wages, of any person employed by them upon or in respect of the said work, the Minister may notify the Contractors to pay such salary or wages, and if two days elapse and the same be not paid in full up to the date of payment or to such other date as may be in accordance with the terms of employment of such person, then His Majesty may pay to such person their salary or wages from any date to any date and to any amount which may be due, and may charge the same to the Contractors; and the Contractors covenant with His Majesty to repay at once any and every sum so paid.

g. In the event of a dispute arising between the Contractor and any employees engaged in the work to be performed under this contract, regarding the rights and privileges intended to be secured to such persons by any clause in the contract, the same shall be referred to the Minister of Labour, who shall have power to decide such questions, and whose decision in such cases shall be final.

SCHEDULE OF WAGES AND HOURS.

Classes of Labour.	Male or Female.	Minimum rate of wages per day.	Maximum of hours per day.	Remarks.

A copy of the above statement shall be posted by the Contractor in a conspicuous place in the workshop where the work under this contract is being performed, with a reference to the contract to which it relates.

SCHEDULE OF ARTICLES CONTRACTED FOR.

Quantity.	Articles.	Price.	Time of Delivery.
	Frieze, Drab, No. 33.....	\$1 55	Commencing in seven days, delivery 5,000 yards per week.

Each piece is to contain not less than 45 yards, nor more than 60 yards.

To be packed in wooden cases, each case to contain four pieces.

Please state in "time of delivery" column, within what time you can make first delivery, and what quantity you can guarantee to deliver weekly thereafter.

Your particular attention is invited to paragraphs one, two, four, and five on opposite page.

Sample cutting attached hereto, showing the shade and finish of the freize required, but in all other details the attached specification must be followed.

(Signature).....

(Address).....

The Honourable,

The Minister of Militia and Defence,
Ottawa.

NOTE—No patterns or samples will be sent to tenderers before the contract is given; but they will be supplied to the Contractor upon application therefor. Samples are not required with tenders.

Tenderers may quote for all the above-named articles and the Minister reserves the right to accept any tender in part only, unless tenderer stipulate in writing hereon for all or none. The lowest or any tender will not necessarily be accepted.

Under no circumstances should tenderers alter the above printed form.

EXHIBIT No 4.

SAMPLE ORDER.

H. Q. 565-6-22

C. D. 397

A. B.

DEPARTMENT OF MILITIA AND DEFENCE,

OTTAWA, February 8, 1915.

SIR,—I have the honour to request you to furnish to the Department of Militia and Defence the undermentioned articles at the prices stated: 35,000 yards frieze, drab, No. 33, at \$1.55 per yard, f.o.b., Ottawa. To be exactly similar in every respect to our sealed pattern and specifications therefor.

It is to be understood and agreed that these goods are to be manufactured by your own operatives in your own premises, upon the following conditions:—

1. The articles to be supplied under this order must be in all respects similar and equal to the sealed patterns and specifications therefor.

2. Delivery (or shipment) is to be made to Militia Inspection Room, 113 Rideau street, Ottawa, free of all charges, on or before March 20, 1915. Not later.

3. Freight or express charges are to be prepaid; if chargeable to this Department the amount should be included in the invoice, to which a receipt from the transportation company for the amount paid must be attached.

4. The invoice, in triplicate, and the shipping bill should be sent to Director of Contracts, Militia Department, Ottawa.

5. Each article of the supply should be stamped with the manufacturer's name and the year of manufacture.

Be good enough to inform me, by return mail, whether you accept the order upon these terms.

I am, sir, your obedient servant,

H. W. BROWN,
Director of Contracts.

Messrs Auburn Woollen Co.,
Peterborough, Ont.

H. Q. 505-6-22
C. D. 397
A. B.

DEPARTMENT OF MILITIA AND DEFENCE,
OTTAWA, February 8, 1915.

FIRST CONTRACT.

SIR,—I have the honour to request you to furnish to the Department of Militia and Defence the undermentioned articles at the prices stated: 35,000 yards frieze, drab, No. 33, at \$1.55 per yard, f.o.b., Ottawa. To be exactly similar in every respect to our sealed pattern and specifications therefor.

It is to be understood and agreed that these goods are to be manufactured by your own operatives in your own premises, upon the following conditions:—

1. The articles to be supplied under this order must be in all respects similar and equal to the sealed patterns and specifications therefor.

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4. The invoice, in triplicate, and the shipping bill should be sent to Director of Contracts, Militia Department, Ottawa.

5. Each article of the supply should be stamped with the manufacturer's name and the year of manufacture.

Be good enough to inform me, by return mail, whether you accept the order upon these terms.

I am, sir, your obedient servant,

H. W. BROWN,
Director of Contracts.

Auburn Woollen Company,
Peterborough, Ont.

I hereby certify that this is a true copy.

J. H. STEPHENS.

D.C. and E. Clothing and necessities,
1914-15—Upkeep. H.Q. 95-116-2-1A.
C.D. 577 & 578.
A.B.

DEPARTMENT OF MILITIA AND DEFENCE,
OTTAWA, March 9, 1915.

SIR,—I have the honour to request you to furnish to the Department of Militia and Defence the undermentioned articles at the prices stated: 8,250 yards frieze, drab, No. 33, at the price last paid you ((\$1.55, order dated 8-2-15), to be exactly similar in

every respect to our sealed pattern and specification therefor, upon the following conditions:—

1. The articles to be supplied under this order must be in all respects similar and equal to the sealed patterns and specifications therefor.

2. Delivery (or shipment) is to be made to Militia Inspection Room, 113 Rideau street, Ottawa, free of all charges, on or before March 25, 1915. Not later.

3. Freight or express charges are to be prepaid; if chargeable to this department the amount should be included in the invoice, to which a receipt from the transportation company for the amount paid must be attached.

4. The invoice, in triplicate, and the shipping bill should be sent to the Director of Contracts, Militia Department, Ottawa.

5. Each article of the supply should be stamped with the manufacturer's name and the year of manufacture.

Be good enough to inform me, by return mail, whether you accept the order upon these terms.

I am, sir, your obedient servant.

Messrs. The Auburn Woollen Co.,
Peterborough, Ont.

H. W. BROWN,
Director of Contracts.

I hereby certify that this is a true copy.

J. H. STEPHENS.

INE.
H.Q. 565-6-23.
C.D. 396.
A.B.

DEPARTMENT OF MILITIA AND DEFENCE,
OTTAWA, June 11, 1915.

SIR.—I have the honour to request you to furnish to the Department of Militia and Defence the undermentioned articles at the prices stated: 3,000 yards frieze, drab, No. 33, at \$1.55 per yard, f.o.b., Ottawa, to be exactly similar in every respect to our sealed pattern and specification therefor, upon the following conditions:—

1. The articles to be supplied under this order must be in all respects similar and equal to the sealed patterns and specifications therefor.

2. Delivery (or shipment) is to be made to Militia Inspection Room, 113 Rideau street, Ottawa, free of all charges, on or before June 23, 1915. Not later.

3. Freight or express charges are to be prepaid; if chargeable to this department the amount should be included in the invoice, to which a receipt from the transportation company for the amount paid must be attached.

4. The invoice, in triplicate, and the shipping bill should be sent to Director of Contracts, Militia Department, Ottawa.

5. Each article of the supply should be stamped with the manufacturer's name and the year of manufacture.

Be good enough to inform me, by return mail, whether you accept the order upon these terms.

I am, sir, your obedient servant,

H. W. BROWN,
Director of Contracts.

The Auburn Woollen Co., Ltd.,
Peterborough, Ont.

I hereby certify that this is a true copy.

J. H. STEPHENS.

Auth. No. 909.

H. G. 565-6-20

C. D. 355.

A. B.

DEPARTMENT OF MILITIA AND DEFENCE,

OTTAWA, JULY 31, 1915.

SIR,—I have the honour to request you to furnish to the Department of Militia and Defence the undermentioned articles at the prices stated: 475 yards friezes, drab, No. 33, at \$1.55 per yard, f.o.b. Ottawa. This order is to cover the quantity you have made up in excess of the orders already given you upon the following conditions:

1. The articles to be supplied under this order must be in all respects similar and equal to the sealed patterns and specifications therefor.

2. Delivery (or shipment) is to be made to Militia Inspection Room, 113 Rideau street, Ottawa, free of all charges, on or before

3. Freight or express charges are to be prepaid; if chargeable to this Department the amount should be included in the invoice, to which a receipt from the transportation company for the amount paid must be attached.

4. The invoice, in triplicate, and the shipping bill should be sent to Director of Contracts, Militia Department, Ottawa.

5. Each article of the supply should be stamped with the manufacturer's name and the year of manufacture.

Be good enough to inform me, by return mail, whether you accept the order upon these terms.

I am, sir, your obedient servant,

H. W. BROWN,

Director of Contracts.

Messrs. Auburn Woollen Co.,
Peterborough, Ont.

I hereby certify that this is a true copy.

J. H. STEPHENS.

INE.

Min. No. 1552.

H. Q. 466-8-13.

C. D. 565-6-13-A

A. B. 318.

DEPARTMENT OF MILITIA AND DEFENCE,

OTTAWA, SEPTEMBER 17, 1915.

SIR,—I have the honour to request you to furnish to the Department of Militia and Defence the undermentioned articles at the prices stated: 20,000 yards freize, drab, No. 33, at \$1.70 per yard, f.o.b. Ottawa. To be exactly similar in every respect to our sealed pattern and specifications therefor upon the following conditions:

1. The articles to be supplied under this order must be in all respects similar and equal to the sealed patterns and specifications therefor.

2. Delivery (or shipment) is to be made to Militia Inspection Room, 113 Rideau street, Ottawa, free of all charges, on or before December 15, 1915. Not later.

3. Freight or overcharges are to be prepaid; if chargeable to this Department the amount should be included in the invoice, to which a receipt from the transportation company for the amount paid must be attached.


REPORT OF COMMISSIONER

4. The invoice, in triplicate, and the shipping bill should be sent to Director of Contracts, Militia Department, Ottawa.

5. Each article of the supply should be stamped with the manufacturer's name and the year of manufacture.

Be good enough to inform me by return mail, whether you accept the order upon these terms.

I am, sir, your obedient servant,

 H. W. BROWN,
Director of Contracts.

Messrs. Auburn Woollen Co.,
Peterborough, Ont.

I hereby certify that this is a true copy.

J. H. STEPHENS.

INE.
W. P. C. 1941.
H. Q. 565-6-16A.
C. D. 409.
A. B. 462-8-17.
P. C. 2395.

DEPARTMENT OF MILITIA AND DEFENCE,
OTTAWA, October 15, 1915.

SIR.—I have the honour to request you to furnish to the Department of Militia and Defence the undermentioned articles at the prices stated: 50,000 yards freize, drab, No. 33, at \$1.75 per yard f.o.b. Ottawa, to be exactly similar in every respect to our sealed pattern and specifications therefor. Confirming our telegram of October 14, 1915, upon the following conditions:—

1. The articles to be supplied under this order must be in all respects similar and equal to the sealed patterns and specifications therefor.

2. Delivery (or shipment) is to be made to Militia Inspection Room, 113 Rideau street, Ottawa, free of all charges. Delivery required at the earliest possible date, but must be completed before January 31, 1916.

3. Freight or express charges are to be prepaid; if chargeable to this Department the amount should be included in the invoice, to which a receipt from the transportation company for the amount paid must be attached.

4. The invoice, in triplicate, and the shipping bill should be sent to Director of Contracts, Militia Department, Ottawa.

5. Each article of the supply should be stamped with the manufacturer's name and the year of manufacture.

Be good enough to inform me, by return mail, whether you accept the order upon these terms.

I am, sir, your obedient servant,

H. W. BROWN,
Director of Contracts.

Messrs the Auburn Woollen Co.,
Peterborough, Ont.

For increase in price to \$1.75, see letter from A.D. of C. to Contractor, dated May 11, 1915.

I hereby certify that this is a true copy.

J. H. STEPHENS.

INE.
Minute 3071.
H. Q. 565-6-16A.
C. D. 409.
A. B.

DEPARTMENT OF MILITIA AND DEFENCE,
OTTAWA, October 28, 1915.

SIR,—I have the honour to request you to furnish to the Department of Militia and Defence, the undermentioned articles at the prices stated: 10,000 yards frieze, drab, number 33, at \$1.75 per yard, f.o.b. Ottawa, to be exactly similar in every respect to our sealed pattern and specification therefor, upon the following conditions:—

1. The articles to be supplied under this order must be in all respects similar and equal to the sealed patterns and specifications therefor.

2. Delivery (or shipment) is to be made to Militia Inspection Room, 113 Rideau street, Ottawa, free of all charges. Delivery must be completed not later than December 31, 1915.

3. Freight or express charges are to be prepaid; if chargeable to this Department the amount should be included in the invoice, to which a receipt from the transportation company for the amount paid must be attached.

4. The invoice, in triplicate, and the shipping bill should be sent to Director of Contracts.

5. Each article of the supply should be stamped with the manufacturer's name and the year of manufacture.

Be good enough to inform me, by return mail, whether you accept the order upon these terms.

I am, sir, your obedient servant,

H. W. BROWN,
Director of Contracts.

Messrs the Auburn Woollen Co.,
Peterborough, Ont.

I hereby certify that this is a true copy.

J. H. STEPHENS.

H. Q. 565-6-25A.
C. D. 486.
W. R. C. 3256.

DEPARTMENT OF MILITIA AND DEFENCE,
OTTAWA, November 9, 1915.

SIR,—I have the honour to request you to furnish to the Department of Militia and Defence the undermentioned articles at the prices stated: 90,000 yards drab frieze, number 33, at \$1.75 per yard, f.o.b. Ottawa. To be similar in every respect to our sealed pattern and specification therefor, upon the following conditions:

1. The articles to be supplied under this order must be in all respects similar and equal to the sealed patterns and specifications therefor.

2. Delivery (or shipment) is to be made to Militia Inspection Room, 113 Rideau street, Ottawa, free of all charges. Delivery must be completed not later than March 31, 1916.

3. Freight or express charges are to be prepaid; if chargeable to this Department the amount should be included in the invoice, to which a receipt from the transportation company for the amount paid must be attached.

4. The invoice, in triplicate, and the shipping bill should be sent to Director of Contracts.

REPORT OF COMMISSIONER

5. Each article of the supply should be stamped with the manufacturer's name and the year of manufacture.

Be good enough to inform me, by return mail, whether you accept the order upon these terms.

I am, sir, your obedient servant,

H. W. BROWN,
Director of Contracts.

Messrs. Auburn Woollen Co.,
Peterborough, Ont.

I hereby certify that this is a true copy.

J. H. STEPHENS.

For increase to \$1.80 see letter to contractor from A. D. of C., dated 24.11.15 (W. S. Ault).

H. Q. P. C. 118.
C. D. W. P. C. 4425.
A. B.

DEPARTMENT OF MILITIA AND DEFENCE,

OTTAWA, January 19, 1916.

SIR,—I have the honour to request you to furnish to the Department of Militia and Defence the undermentioned articles at the prices stated: 265,000 yards frieze, drab, No. 33, at \$1.95 per yard f.o.b. Ottawa, to be exactly similar in every respect of our sealed pattern and specification therefor upon the following conditions:—

1. The articles to be supplied under this order must be in all respects similar and equal to the sealed patterns and specifications therefor.

2. Delivery (or shipment) is to be made to Militia Inspection Room, 113 Rideau street, Ottawa, free of all charges. Delivery is to be made in equal weekly instalments, to be completed not later than September 1, 1916.

3. Freight or express charges are to be prepaid; if chargeable to this Department the amount should be included in the invoice, to which a receipt from the transportation company for the amount paid must be attached.

4. The invoice, in triplicate, and the shipping bill should be sent to Director of Contracts.

5. Each article of the supply should be stamped with the manufacturer's name and the year of manufacture.

Be good enough to inform me, by return mail, whether you accept the order upon these terms.

I am, sir, your obedient servant,

H. W. BROWN,
Director of Contracts.

Messrs. Auburn Woollen Co.,
Peterborough, Ont.

I hereby certify that this is a true copy.

J. H. STEPHENS.

For increase to \$1.95 see W.P.C. 4607.

EXHIBITS NOS. 4-A, 5, 6, 7, AND 8.

Samples of friezes.

EXHIBIT No. 9.

SPECIFICATION—AUBURN WOOLLEN MILLS CO.

Specification.—Drab Serge, Fricze and Cloth—To Govern Manufacture and Inspection.

1. Supplies must correspond in all respects with the standard patterns, which may be seen at the inspection room, 113 Rideau street, Ottawa, and with the particulars on the labels attached to them. In points which are subject to unavoidable variation such as strength and weight, the label or specification is to be taken.
2. The materials may be inspected during manufacture by, and after delivery will be subject to testing by, and final approval of, the Director of Contracts, or of an officer appointed by him.
3. Intending contractors should carefully examine the patterns and take note of the particulars of the labels. No plea on the score of insufficient information on these points will be taken into consideration after the tender has been accepted. The Director of Contracts will afford every information in his power to assist contractors in forming a correct idea of the merits of any pattern.
4. All 6-quarter serges, frieze, and cloths should measure the width specified on the labels attached to the respective standard patterns; none will be accepted which are more than 2 inches below that width. Supplies which are not more than 2 inches narrow will be accepted, subject to the following deductions in length:—
For 1 inch narrow, 1 yard in 40 yards, or one-quarter yard in every 10 yards (or portion of 10 yards).
For 2 inches narrow, 2 yards in 40 yards, or one-half yard in every 10 yards (or portion of 10 yards).
Lining serges should be 56 and 36 inches wide; if under this they will be rejected; no deduction will be made in their case.
5. All 3-quarter cloths and flannels to be fully 28 inches wide between the lists, unless specified otherwise on the label or they will be rejected.
6. The measurement of the width will be taken exclusive of the lists, and the pieces will be measured at the rate of 36 inches to the yard.
7. Supplies must be thoroughly dry (no damp whatever is allowed), and be clean and scoured free from grease, soap, filling or any other mixture which may be used to give fictitious weight, substance or firmness to the fabric.
- Cloths, friezes, and serges must be delivered "London Shrunk." Linings also must be thoroughly shrunk before delivery.
8. A linen drop-ticket, with the contractor's name printed thereon, must be attached to each piece.
9. Pieces which have been rejected for some remedial defect may be resubmitted for inspection, but such pieces must be delivered separately from other new goods and a note be attached to or a remark made upon the inspection note to the effect that the pieces are former rejections.
10. The Honorable the Minister of Militia reserves to himself the right of submitting all cloths to such tests as he may think proper for the purpose of ascertaining that they are in accordance with the patterns and specification, and to cut out, or off, and destroy a portion not exceeding 2 per cent from each delivery for such purposes as may be considered necessary; or to wash and dry any piece or pieces for the purpose of ascertaining that they are in accordance with the conditions contained in paragraph 7.

General Conditions.

11. If upon examination of one-fourth, taken indiscriminately from any delivery, the samples be found to be inferior to the standard pattern, or contrary to this specification, or should any which have been finally rejected for non-repairable defects be re-delivered for inspection, the whole delivery will be liable to rejection.

12. To be delivered, free of expense, at the inspection room, 113 Rideau street, Ottawa, packed in cases; each package to be marked with the contractor's name, to be numbered at each end; particulars of marks and number must be shown on the inspection notes. Packing tickets, showing the contents must be enclosed in every package.

13. Rejections belonging to contractors will be forwarded to them at their expense.

EXHIBIT No. 9.

Specification.—To accompany General Specification.

No. 21—Serge, Drab, for Caps.

Dye—Fast Color.
Width—56 inches.
Finish—As Sealed Sample.
Woven—Twill.
Weight—15 oz.

No. 22—Serge, White, Lining.

Woven—Twill.
Weight—8½ oz. per square yard.
Strength—
Warp—375.
Weft—375.
Width—36 & 56 inches.
Finish—As Sealed Sample.
Elasticity—
Warp—2½ inches.
Weft—2 inches.

No. 31—Serge, Drab, for Frocks.

Dye—Fast Color.
Width—56 inches.
Finish—As Sealed Pattern.
Strength—
Warp—650.
Weft—600.
Woven—Twill.
Weight—20-21 oz.
Elasticity—
Warp—1½ inches.
Weft—2¼ inches.

No. 32—Serge, Drab, for Trousers.

Dye—Fast Color.
Width—56 inches.
Finish—As Sealed Sample.
Strength—
Warp—700.
Weft—665.
Woven—Twill.
Weight—27-28 oz.
Elasticity—
Warp—1½ inches.
Weft—2½ inches.

No. 33—Freize, Drab, for Great Coats and Cloaks.

Dye—Fast Color.
Width—58 inches.
Finish—As Sealed Pattern.
Strength—
Warp—600.
Weft—550.
Woven—Plain.
Weight—32-33 oz. per yard.

Elasticity—
Warp—2½ inches.
Weft—2½ inches.

No. 34—Cloth, Drab, for Breeches.

Dye—Fast Color.
Width—56 inches.
Finish—As Sealed Pattern.
Strength—
Warp—700.
Weft—680.
Woven—Twill.
Weight—30-31 oz.

Elasticity—
Warp—2½ inches.
Weft—3¼ inches.

EXHIBIT No. 10.

Samples of Freize, subject to a number of tensile tests.

This is a sample in the office and is not identified as an Auburn Mills delivery.

P. 4771478 Burns.

EXHIBIT No. 11.

MILTON HERSEY CO., LTD.,

CHEMISTS, ENGINEERS AND INSPECTORS.

84 ST. ANTOINE STREET,

MONTREAL, May 1, 1916.

Report.

Samples Khaki Frieze.

34575	Sample marked No. 33, Militia Department.
34576	" 5, "
34577	" 6, "
34578	" 7, "
34579	" 8, "

Hon. Sir CHARLES DAVIDSON,
Ritz-Carlton Hotel,
Montreal,

DEAR SIR,—We have made careful examination of the samples of khaki frieze which you recently submitted. The results of our examination are shown in the following tables:—

REPORT OF COMMISSIONER

MECHANICAL ANALYSIS.

Lab. No.	Warp Fibres.		Weft Fibres.	
	Under 1½.	Over 1½.	Under 1½.	Over 1½.
34575.....	71.2	28.8	67.8	32.2
34576.....	80.8	19.2	89.0	11.0
34577.....	77.2	22.8	85.7	14.3
34578.....	88.7	11.3	88.9	11.1
34579.....	90.2	9.8	90.0	10.0

COTTON IN FABRIC.

34575.....	0.215 %
34576.....	0.85
34577.....	0.90
34578.....	0.80
34579.....	1.30

YARNS PER INCH.

Lab. No.		Warp.	Weft.
34575	Pattern 33	32	32
34476	" 5	25	27
34577	" 6	25	27
34578	" 7	26	28
34579	" 8	25	28

In neither the standard sample or the cloth supplied does the count correspond with the specifications required at nineteen ends per inch.

Tensile Strength per 1"

Lab. No.	Direction.	1st.	2nd.	Average.
34576 No. 5	Warp.....	67	64	66 lbs.
	Woof.....	60	61	62 lbs.
34577 No. 6	Warp.....	53	52	53 lbs.
	Woof.....	50	51	51 lbs.
34579 No. 7	Warp.....	52	50	51 lbs.
	Woof.....	51	49	50 lbs.

Equal to Tensile Strength of 9"

		No. 1.	No. 2.	Average.
34576 No. 5	Warp.....	603	576	589
	Woof.....	510	576	558
34577 No. 6	Warp.....	477	468	472
	Woof.....	450	459	455
34579 No. 7	Warp.....	450	468	459
	Woof.....	441	459	450

The tensile strength of the cloth in samples No. 6 and No. 8 is not equal to the requirements of the Government specification. We were unable to determine the tensile strength of the standard sample and of sample No. 7 because they were too small.

In our opinion attention should be given to tensile strength only in connection with the examination of the yarn used and of the fibre composing the yarn, as the tensile strength is not dependent only upon the grade or quality of the wool used, but also upon the amount of twist put in the yarn, and the treatment it has received in the process of manufacture.

It is well known that the tensile strength may be increased by merely putting additional twist in the yarn.

It is impossible to determine the relative amounts of new wool and of wool stock used in making these cloths, as the wool stock used is made from tailors' cuttings of new and unworn cloth. In our opinion it is not essential what proportions are used so long as the resulting fabric contains as long and as good a fibre as does the standard which it is made to match. In other words, it makes no difference whether a given wool fibre comes from new wool or from wool stock so long as it is equally good in quality and length. This involves the necessity of using a high grade wool stock made from new rags, and we have been unable to detect the presence of any low grade wool stock or shoddy in any of the samples.

The length of the fibre found in the yarn is an indication of the quality of the cloth; the longer the fibre the better the cloth, while cloth with short fibre is correspondingly inferior. In these frieze there is a noticeable difference in the length of the fibre. The standard sample is better in this respect than any of the deliveries we examined. The low percentage of long fibre and the corresponding amount of short fibre shows the comparative inferiority of the cloth delivered compared with the standard. This inferiority, while not great, is indicated further by the higher amount of cotton fibre and by the low tensile strength.

The cotton fibre in the samples is too low to have any material effect upon the quality of the cloth in any case, but shows that a greater amount of, or a slightly lower grade of wool stock, has been used in making it.

Yours truly,

MILTON HERSEY CO., LTD.

C. R. HAZEN, *Vice-President*.