UNITED STATES TARIFF COMMISSION

MICRON GRADING OF WOOL

Report on Investigation No. 332-34 (Supplemental)
Under Section 332 of the Tariff Act of 1930

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(TC28827)

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INTRODUCTION

This report supplements an earlier report by the U.S. Tariff Commission 1/ issued pursuant to a resolution adopted by the Committee on Finance of the U.S. Senate on April 28, 1958. Among other matters, the resolution directed the Commission to make "An analysis of the present method of grading and sampling of imported wools, and an analysis of any alternative methods of grading and/or sampling, as the Commission's study may develop."

For customs purposes, imported wool is presently classified by visual examination. If the wool is specifically identified by name in the Tariff Act of 1930, or is "similar" to those named, it is so classified for tariff purposes without reference to its grade. All other wools are visually classified by grade, which is based solely on the fineness (i.e., diameter) of the fibers as defined by the U.S. Department of Agriculture standards of 1926. The alternative method of grading wool considered by the Commission in its earlier report was the micron method, which is based on laboratory measurement, in microns (millionths of a meter), of the diameter of many wool fibers. The micron grade specifications used in the Commission's report were those prescribed by the American Society for Testing and Materials (ASTM). 2/

The Tariff Commission originally planned to have only the U.S. Department of Agriculture (USDA) wool laboratory in Denver make micron analyses of the wool samples collected during its investigation. The

1/ U.S. Tariff Commission, Wool for Carpets and Papermakers' Felts: Report on Investigation No. 34 Under Section 332 of the Tariff Act of 1930 . . ., 1959 (processed).

2/ "Standard Specifications and Method of Test for Fineness of Wool: D 419-58," ASTM Standards on Textile Materials, 1959, pp. 198-204.

wools that were sampled were limited to those that are usually considered to be coarse wools, since they are generally the only wools whose dutiable status would be affected by changes in grade if micron grading were to be used in place of, or in conjunction with, visual classification. The American Carpet Institute 1/ agreed to assist in locating and obtaining wool samples. At the suggestion of the institute, large samples were collected so that portions could be furnished to three laboratories--the USDA laboratory and two private laboratories.

Part of the micron test results from only one laboratory (USDA) were received by the Commission in time to be incorporated in its September 1959 report. At the time that report was issued, the Commission did not plan to publish an analysis of the remaining test results. Since publication of the 1959 report, however, considerable interest in micron analysis has been manifested by individuals both in private industry and in various Government agencies. Moreover, Public Law 86-557, approved June 30, 1960, authorized the Secretary of Agriculture to determine the official grade standards for imported wool; the Secretary is thus authorized to extend micron grading to imported wools should he so choose. In view of the interest expressed, the Tariff Commission decided to make available its analysis of all the micron test data received from the three laboratories. The micron grade specifications employed in this report are virtually the same as the ASTM grade specifications employed by the Commission in its 1959 report. They are also the grade specifications included in a set of micron standards which the Department of Agriculture is planning to propose for official use.

1/ The national trade association of the domestic carpet manufacturers.

Although the aforementioned resolution of the Senate Finance Committee called for an analysis of methods of sampling wool, little new information on sampling appeared to be needed. Sampling is ordinarily not involved in determining the tariff classification of imported wools under the present (visual) method of grading, since visual classification is generally made by a direct examination of the wool in the bales. The samples that have usually been employed for micron analysis are the residues from samples taken for the determination of the clean content of wool. 1/ Nevertheless, to determine the adequacy of hand samples for grade determination by micron testing, samples were taken by hand from various lots of wool (in accordance with ASTM specifications), and a small number of them were subjected to micron analysis.

The Tariff Commission is indebted to the three laboratories--the Department of Agriculture laboratory and the two private laboratories (ACH Fiber Service, Inc., 11-17 Melcher Street, Boston, Mass., and U.S. Testing Co., 288 A Street, Boston, Mass.)--which micron-tested the wool samples provided them. The general technical proficiency of these laboratories in the wool-testing field is well known. The three laboratories are identified in this report by letters of the alphabet. The Commission is also indebted to the U.S. Bureau of Customs and the U.S. Department of Agriculture for their cooperation in this supplementary study. The Tariff Commission, of course, takes full responsibility for the analysis and the material presented in this report.

1/ Clean-content determinations are usually made in connection with the merchandising and importation of wool.

SUMMARY AND CONCLUSIONS

In the course of the Commission's investigation, samples of certain imported coarse wools were obtained, were officially classified for customs purposes by visual examination, and were sent to three laboratories for micron testing. The results of the visual examination and the micron tests constitute the basis for this report.

Wools are commonly grouped into two categories--"improved" wools and "unimproved" wools. As the names suggest, the former are obtained from sheep that have been improved by selective breeding, whereas the latter are from sheep that have changed little from their original native character. Among other distinguishing characteristics, improved wools are distinctly more uniform in fiber diameter than unimproved wools. This difference is apparent on sight to one familiar with wool; data obtained during the investigation indicate that it is equally discernible by micron measurement. A coefficient of variation of 33 percent has been found by analysis of micron tests to be the dividing line between the two groups of wool.

The micron grading system, like the visual grading system, is based on fiber diameter. Use of micron grading would provide an objective method of determining the tariff classification of imported wool; i.e., the average fiber diameter of a wool is determined from actual measurements of the diameter of several hundred wool fibers in a laboratory. Under the present official grading system, the tariff classification of imported wool is determined from a visual observation of wool fineness (i.e., fiber diameter) as it appears in the bale at the time of importation.

In this investigation each laboratory tested the wool samples in duplicate. This procedure permitted within-laboratory comparisons to be made between the test results of the duplicates for each sample, and also permitted comparisons to be made between laboratories of test results for each sample (using the sum of the duplicates). The Commission's analysis of the within-laboratory tests on these duplicates indicates that there were larger differences between duplicates, particularly for two of the laboratories, than would normally be expected. The results from the third laboratory were closer to expectations.

The extent of agreement between laboratories on tariff grades for improved wools ranged from 56 percent to 74 percent and averaged 62 percent. Such interlaboratory agreement would probably have been higher had test procedures been more fully standardized. With the adoption of more uniform procedures, it is reasonable to expect that any two laboratories would agree on tariff grade for more than 75 percent of the improved wools they test. Because of the sharp dividing lines that exist between the wool classifications, it would be virtually impossible, however, for any two laboratories using tests of the type employed in this study to agree on grade for more than about 90 percent of their tests. Some increase in the extent of agreement between laboratories could always be obtained, however, if the number of fibers measured per sample were significantly increased above the 1200-1600 fibers per sample that were measured in this investigation.

The analysis of the data obtained in this investigation indicates that the use of a combined visual and micron system of classification would be reliable and would be more objective than the visual classification system now in use. However, micron grading cannot be regarded as a complete substitute for visual classification. Its use without a visual inspection would not be feasible or possible for several reasons:

1. Present U.S. customs classifications require that the condition of imported wools (in the grease, sorted, scoured, or on skins) as it enters the country be identified. The only practical method of determining this is by visual examination.

2. Micron measurement provides no basis for distinguishing the named and similar wools, which have the lowest rates of duty, from other unimproved wools. They can be distinguished only by visual examination.

3. A customs classification system based only on micron testing would be both expensive and time-consuming. The use of micron testing in connection with a suitable visual examination, however, would permit the vast majority of imports (about 75-90 percent of all entries) to be classified by visual inspection. Micron analysis would therefore be necessary only for borderline lots where the examiner was uncertain of the grade or where the importer protested the classification made by the examiner. Particle size counters that provide satisfactory fiber-diameter distribution data for wool have not yet been perfected but may be in the offing. Such devices could shorten the time required for micron analysis of a coarse wool from a matter of a day to less than an hour and lead to substantial reductions in cost.

The tariff classification of most imported wools and the rates of duty applicable to them would not be affected by a change to micron grading. Two large groups, which account for more than half of all imported wools, would not be influenced by changes in grading methods. The first of these groups consists of the 30 types of wool named in paragraph 1101(a) of the Tariff Act of 1930 and wools regarded as

similar to them. "Named and similar" wools qualify for entry as such without regard to their grade or fineness. The second group consists of wools much finer than 46s (e.g., 56s and finer) imported into the United States; 1/ these finer wools, which are subject to the same rate of duty regardless of grade or use, are quickly and clearly classified by visual examination.

The rates of duty for the remaining wools imported into the United States depend upon the grade (i.e., fineness) of the wool. Some of these are unimproved (i.e., variable) wools consisting mainly of mixtures of named and improved wools and of carpet-type blends. Such wools are sent to the United States only when they are believed to have a tariff grade of not finer than 46s, since their principal use is in carpets. Thirteen lots of mixtures and blends obtained for this study were classified visually as being not finer than 40s; 8 of them were found by micron grading to be finer than 46s--a classification which would preclude their duty-free use in carpets. Under a micron method of grading there would undoubtedly be fewer imports of such mixtures and blends than formerly.

Coarse improved wools (i.e., improved wools like those tested in this investigation) constitute the rest of the imported wools whose rates of duty depend upon their grade. The introduction of micron grading would cause considerable change in the tariff grades assigned to these coarse improved wools, regardless of the particular standards which

1/ All wools finer than 46s, except carbonized wools, are subject to the same rate of duty, regardless of grade or use. Wools not finer than 46s (including the named and similar wools) are free of duty if imported for use in carpets or other specified purposes.

might be established for micron grades. Only about three-eighths of the 76 lots of improved wools tested in this study received the same micron and visual tariff grade. 1/ Most of these 76 lots originated in New Zealand and Argentina. The New Zealand wools showed considerable disparity between their visual and micron tariff grades; their grades would be somewhat coarser, on the average, if the micron system of grading were adopted. Nearly all Argentine wools, however, were found by micron tests to have tariff grades that were finer than the tariff grades assigned by visual examination. There is little doubt that most coarse Argentine wools would be classified at least one tariff grade finer if the micron method of grading was adopted.

Although, as described just above, the substitution of micron testing for visual examination would result in substantial changes in the tariff grades of coarse improved wools imported into the United States, such substitution would have a considerably smaller effect on their eligibility for free entry under bond for use in carpets or other specified purposes. To be eligible for free entry, improved wools must be graded as 46s or coarser. Of the 76 lots of improved wools tested in this study, 72 qualified for duty-free entry according to the grade visually assigned. Of these 72 lots, 2 did not qualify for free entry when graded by micron tests. The remaining 4 lots were not eligible for free entry according to the grade assigned visually. When graded on the basis of micron tests, however, they were eligible for duty-free

1/ Although 80 lots of improved wool were tested, only 76 of them were compared with the grades visually assigned.

entry. It is estimated, therefore, that the dutiable status of about 10 percent of all wool imported in recent years would have been different had micron grading been in effect.

Named and similar wools are generally regarded as being much too coarse and heterogeneous for apparel use. The heterogeneity in fiber diameter is quite apparent both from visual inspection and from the micron results. The named and similar wools tested in this investigation proved not to be as coarse as previously suspected, however. Almost half of them (24 out of 53) were found to be finer than 46s on a micron grading basis.

Although this study of the micron grading of wool is concerned principally with the analysis of tests on samples taken with a coring tool, a small number of tests on samples taken by hand were also analyzed. These analyses indicate that hand samples are not suitable for micron analysis of wool.

U.S. TARIFF CLASSIFICATION OF WOOL

Wool imported into the United States is dutiable under the provisions of paragraphs 1101 and 1102 of the Tariff Act of 1930. 1/ Paragraph 1101 provides, eo nomine, for "named and similar" wools; it also provides for wools not finer than grade 40s. The named wools are wools from sheep which are native to certain designated regions and which for the most part do not have merino or English blood. 2/ The term "similar" wools refers to wools without merino or English blood which are not named wools but which are similar to them. 3/ Paragraph 1102 provides for wools finer than grade 40s.

For duty purposes, the grades pertinent to wools that are neither named nor similar are (1) not finer than 40s; (2) finer than 40s, not finer than 44s; (3) finer than 44s, not finer than 46s; and (4) finer than 46s. 4/ Although these four tariff grades are the only ones pertinent for duty purposes, a larger number of grades are used commercially within the United States. They begin at 36s (very coarse), continue with 40s, 44s, 48s, 50s, and so forth, and end at 64s (fine). While these

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1/ Carbonized wools are dutiable under the provisions of par. 1106, but the amount of such wools imported into the United States is small; carbonized wools are not further discussed in this report.

2/ The wools named in par. 1101 are as follows: Donskoi, Smyrna, Cordova, Valparaiso, Ecuadorean, Syrian, Aleppo, Georgian, Turkestan, Arabian, Bagdad, Persian, Sistan, East Indian, Thibetan, Chinese, Manchurian, Mongolian, Egyptian, Sudan, Cyprus, Sardinian, Pyrenean, Oporto, Iceland, Scotch Blackface, Black Spanish, Kerry, Haslock, and Welsh Mountain.

3/ Few types of wool have qualified as "similar" under the 1930 tariff act. The principal types which have qualified are Karakul (regarded as similar to Persian wools), Herdwick, and Swabdale (regarded as similar to Scotch Blackface), and Anatolean wools (regarded as similar to Bagdad).

4/ For convenience, these four tariff grades are frequently identified in this report as follows: (1) nf/40s, (2) 44s, (3) 46s, and (4) f/46s.

designations originally had reference to the amount of yarn that could be spun from a given weight of wool, they now refer to official standards established by the U.S. Department of Agriculture in 1926. Official replicas of these standards have been made available to the Bureau of Customs wool examiners to enable them to determine the rate of duty on the wools that must be graded.

The Tariff Act of 1930 specifies that the wools provided for in paragraph 1101 may be imported free of duty for the manufacture of carpets and certain other uses. 1/ This duty-free provision was extended temporarily, in 1958, to wools not finer than 46s destined for the same end uses as those specified in the 1930 act. The extension was made permanent in 1960; at that time, the specified end uses were broadened to cover wool used in papermakers' felts.

The categories of wool pertinent for duty purposes, and their respective rates of duty, are shown in table 1. In addition to distinguishing visually between these categories for duty purposes, customs examiners must distinguish between certain conditions of imported wool at the time of importation since the rate of duty varies not only according to grade but also according to the condition of the wool. The different rates of duty which apply to specified conditions of wool (in the grease or washed, on skins, sorted, and scoured) are intended to afford protection to industries that perform the preliminary processing of wool in the United States.

1/ The other duty-free uses are for the manufacture of press cloth, camel's hair belting, knit or felt boots, and heavy fulled lumbermen's socks.

The differences in the fineness of fiber diameters between adjacent grades of wool are very small--about 1/10,000 of an inch. Consequently, considerable training and experience are required before customs examiners can make meaningful visual evaluations of fineness. To be consistent in grading, the examiners must be familiar with many grades and types of wool. Even then, working conditions (light, temperature, and the like), condition of the wool (fleece, greasy shorn, scoured, washed, pulled, and so forth), and other extraneous factors influence their determinations. In visual grading, the examiner is governed to some extent by characteristics more readily perceptible than fiber diameter, such as crimp, fiber length, country of origin, strength, handle, and resilience, which are correlated with fineness.

Examination is made by the Bureau of Customs of each lot of wool entered. For some lots this examination is, of necessity, detailed and time consuming, especially if the wool is close to the borderline of two grades for which different rates of duty apply. For most lots, however, a definite grade for duty purposes can be assigned after a brief inspection.

PROCEDURES FOLLOWED IN OBTAINING AND ANALYZING WOOL SAMPLES

To provide information on present and alternative methods of grading wool, the Commission obtained samples of imported wools. These samples were collected with as little change from the usual entry and customs procedures as possible, and an official visual customs classification of the wool was obtained at the time each sample was drawn.

Sample Collection Procedures

A sampling team composed of representatives of the U.S. Bureau of Customs, the U.S. Department of Agriculture, and the U.S. Tariff Commission was formed to obtain wool samples for this project. The staff of the Tariff Commission in cooperation with the other members of the team then developed a list of wools to be sampled. This list, which was based on data relating to wool imports in earlier years, described foreign coarse wools by kind, type, and grade; it also indicated the approximate proportion of each listed wool to total imports of all wools coarser than grade 50s (including named and similar types) in recent years. The list covered only these coarser wools since it is only within this group that different rates of duty apply to different grades of wool.

The team used the list as a guide to obtain samples of 146 lots of wool. Each lot consisted of 20 bales which were selected

from a customs entry of a particular type of wool. 1/ The entire 146 lots were selected from six carpet mills and two papermakers'-felt mills, from piers, and from warehouses of wool dealers. The lots were officially (visually) graded by Bureau of Customs examiners.

The 146 lots of wool from which samples were drawn are listed on the following page. They are divided into two major categories, improved and unimproved; within each category they are also individually listed in accordance with their visual tariff classification.

1/ For a few lots the desired number of bales could not be obtained. The sample for each of these lots was taken from the bales available and correspondingly more wool per bale was drawn.

Unimproved wools	Number of lots
Named and similar:	
Cordova	1
Scotch Blackface	4
Haslock	1
Welsh Mountain	3
Cyprus	3
Sardinian	2
Aleppo	6
Awassi	4
Iranian	6
Joria	1
Vicanere	1
Bicanere	3
East Indian	2
Montgomery	4
Pakistan	1
Khorrassan	2
Kandahar	2
Mongolian	3
Irish Blackface	1
Karakul	2
Yugoslavian	1
Subtotal	53
Mixtures of named and improved (classified as not finer than 40s):	
Cordova and 40s	3
Scotch Blackface and 40s	1
Sardinian and 40s	1
Subtotal	5
Carpet blends (classified as not finer than 40s):	
Londonshire	1
English	1
Welsh	1
English crossbred	1
Holland	4
Subtotal	8
Total unimproved	66

Improved wools	Number of lots
Not finer than 40s:	
N.Z. felt	3
N.Z. soft cotted	1
N.Z. "B"	2
N.Z. early shorn	1
N.Z. 2d shear	2
N.Z. pulled	1
N.Z. crutchings	7
Argentine BA 5/6s	15
German	3
Irish	4
United Kingdom, Devon	2
Uruguay	2
Subtotal	43
Finer than 40s, not finer than 44s:	
N.Z. felt	6
N.Z. "B"	2
N.Z. early shorn	2
N.Z. crutchings	6
N.Z. dag	1
Irish felt	2
Australia, "B"	1
Uruguay, Monte Criolla	1
Subtotal	21
Finer than 44s, not finer than 46s:	
N.Z. felt	4
N.Z. "B"	1
N.Z. "C"	1
N.Z. 2d shear	1
N.Z. crutchings	1
Subtotal	8
Finer than 46s:	
N.Z. "B"	1
N.Z. 2d shear	3
Subtotal	4
Composite grades (bales mixed):	
N.Z. 44s-46s	1
N.Z. 40s-44s-46s	3
Subtotal	4
Total improved	80

Grand total---- 146

Core samples

Samples drawn with a coring tool from bales of wool are known as core samples. The tool used in this study was a half-inch rotating sampling tube about 18 inches long with a sharpened cutting edge. In penetrating the bale, it cut a core of wool which remained in the tube until ejected into a container. The cores were taken substantially in accordance with the sampling procedure prescribed by the American Society for Testing and Materials, 1/ except that no attempt was made to preserve the moisture content of the sample. Essentially, this procedure requires that substantially all parts of a bale be accessible to the coring tool, and that all parts be represented in the wool which is drawn. From each of the 20 bales in a lot, 4 cores were drawn, making a total of approximately 80 cores; 2 of the 4 cores from each bale were combined to form one duplicate sample (of 40 cores) and the other 2 cores from each bale were combined to form a second duplicate sample (of 40 cores).

1/ "Standard Method of Core Sampling of Raw Wool in Packages for Determination of Percentage of Clean Wool Fiber Present: D 1060-58," ASTM Standards on Textile Materials, 1959, pp. 419-426.

As the duplicate samples from each of the 146 lots were drawn, they were separately packaged and forwarded to the U.S. Customs Laboratory in Boston, where each duplicate was individually scoured and mixed. 1/

After being scoured and mixed, the wool in each duplicate was removed from the scouring solution in very small quantities and distributed into three portions. After drying, one portion was sent to each of the three laboratories for micron analysis. Thus, each laboratory received 292 duplicates representing 146 lots of wool. The laboratories were furnished the sample number, country of origin, and condition and description of the wool, but not the customs grade. 2/

Hand samples

In addition to the core samples, hand samples were drawn for use in this study. They were drawn in accordance with the hand sampling provisions of ASTM Standard D 419-58. For each lot, an aggregate of about 40 pounds of wool was taken by hand from at least two bales, which were selected at random from the lot. Each 40-pound sample was divided, by a random procedure, into four portions. 3/ One portion was forwarded to each of the three cooperating laboratories, and the fourth portion was retained by the Bureau of Customs. The hand samples were obtained primarily to provide samples of the wools tested in this investigation. A few were also used for comparison with core samples.

1/ In "scouring," wool is thoroughly washed with a cleansing agent to remove grease and dirt.

2/ Contrary to usual experimental design, the Tariff Commission disclosed the identity of the duplicates. Subsequent analysis of the data in table 7 has not shown, however, that this affected the results in any way.

3/ A small (1/2 pound) sample was also retained by the Tariff Commission.

Laboratory Analysis

Single diameter method of measuring wool fibers

The single diameter method of measuring the diameter of wool fibers is described in ASTM Standard D 419-58. Essentially, this method involves measuring the diameters of a specified number of wool fibers on a magnified projection of the longitudinal (side) view, as opposed to the cross-section (end) view of the fibers. In order that the fibers may be measured in this manner, they are first packed parallel to one another in a viselike holder. This holder keeps the fibers together and allows the mass to be extruded longitudinally so that the fibers may be cut with a razor blade at right angles to their length. When the holder has been packed and the excess fibers are trimmed off, the mass is extruded about 250 microns and cut off. This first cut is usually discarded. After another extrusion of about 250 microns, a second cut is made with a clean razor blade. The fibers obtained on the second cut are removed from the blade with a dissecting needle, placed on a microscope slide, dispersed in a few drops of mineral oil, and the slide is completed with a cover glass.

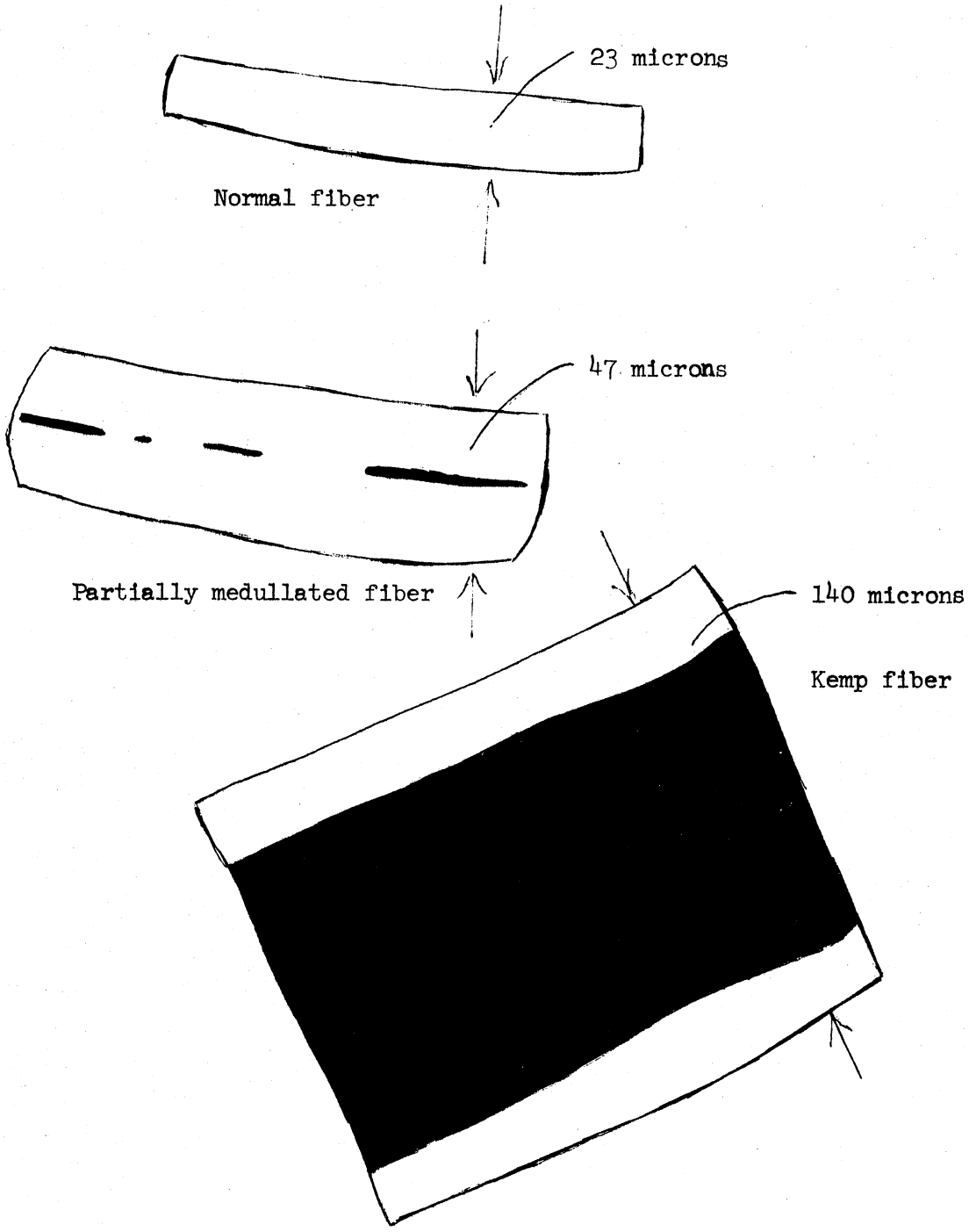
The covered slide is inserted into a microprojector which projects a microscopic field onto a horizontal surface. The projector is adjusted to magnify the image exactly 500 times. The projected image of the cut wool fibers resembles short lengths of rope scattered on a light background. The diameter of the required number of fibers is measured by, and recorded on, a printed cardboard wedge-scale. When kemp fibers (described below) are found, they are not measured but merely counted.

Bidiameter method of measuring wool fibers

Cross-section slides are needed to measure wool by the bidiameter method. These slides are prepared by a method similar to the single diameter method. Wool fibers are packed parallel in the holder, extruded, trimmed, and again extruded. A drop of embedding medium, however, is put on the fibers prior to cutting. When this chemical hardens, it acts as a mount and keeps the fibers from moving while they are cut. The embedded mass of fibers is extruded about 15-20 microns and cut off. It is then mounted on a slide so that the short lengths of fiber are standing on end, and the slide is placed in the microprojector for cross-section measurement. The diameters are measured in two directions, at right angles to each other, and then the two measurements are averaged.

The bidiameter method of measuring wool fibers is particularly applicable to those fibers which are highly medullated, although it may also be used to measure nonmedullated wool fibers. Medullated fibers are hollow fibers; that is, they have air spaces within the fiber which vary in size from tiny fragmented hollow sections to continuous large hollow centers. Hollow areas may appear in fibers of all diameters, though most of the fibers in which they appear are more than 30 microns in diameter. There is virtually no doubt whether a fiber is medullated; there is only doubt as to the proportion that is medullated. On microprojection, these hollow portions appear as black areas in an otherwise translucent image (see fig. 1).

Figure 1.--Diagram of wool fibers as they would appear under the single diameter method of measurement when magnified 500 times



Kemp fibers are defined, for purposes of this investigation, as fibers in which the hollow center accounts for more than three-fourths of the diameter. They are characteristically ribbon shaped, often measuring as much as 200 microns on their elongated side and as little as 20 microns on their short side. Kemp fibers lie on their elongated side when placed on a microscope slide to be measured by the single diameter method; the measurement consequently is of the widest side. Under the bidiameter method, the diameters of both the elongated and short sides are determined and then averaged.

Measurement procedures followed by the laboratories

Three laboratories participated in the present investigation. Each of the analyses they performed was based on the measurement of the diameters of many fibers. From these measurements the distribution of diameters, percent of medullated fibers, and percent of kemp fibers were determined. Measurements were made separately for the duplicates of each lot tested. The number of samples analyzed and the number of fibers per sample that the laboratories measured were as follows:

Laboratory	Number of samples analyzed	Number of fibers measured per duplicate	Total number of fibers measured per sample
A	146	800	1,600
B	121	800 (10 lots)	1,600
		600 (111 lots)	1,200
C	146	Nonconstant number 1/	Nonconstant number 1/

1/ For the entire 146 lots, the number of fibers measured per duplicate averaged 615 and ranged from 581 to 723. The number of fibers measured per sample averaged 1,231 and ranged from 1,198 to 1,373.

The exact number of fibers measured for each sample by each laboratory is shown in tables 2, 3, and 4.

The procedures followed by the three laboratories were not identical. Laboratory A measured fibers on a single diameter basis except when kemp fibers were found. The kemp fibers were not measured but merely counted. An equal number of kemp fibers from the appropriate duplicates of the sample were subsequently measured by the bidiameter method and these measurements were included with those obtained on a single diameter basis in the report of fiber diameters sent to the Commission. Laboratory B followed a procedure almost identical with that followed by laboratory A. In preparing some samples for bidiameter measurement, however, laboratory B used a hooked wire to draw the fibers part way through a small hole in a cork. A transverse slice of this cork with the wool fibers held in the center was then inserted in the microprojector to obtain a cross section image which was measured as described above. Because this procedure had a tendency to cause the largest, most brittle kemp fibers to break and possibly to be lost from the sample, it was replaced during the study by the one described in the above section on the bidiameter method of measuring wool fibers. No record was made, however, of the particular samples analyzed by each method.

Laboratory C did not make bidiameter measurements of kemp fibers but instead measured all fibers on a single diameter basis. Consequently, the results of the micron tests made by laboratory C for those lots of wool containing significant portions of kemp fibers resulted in average diameters appreciably larger than would have been obtained had the tests been made on a bidiameter basis.

Some hand samples were also subjected to micron analysis in this investigation. The special laboratory procedures they required are described in the section entitled "Hand sampling."

Statistical Reporting

Each laboratory used forms like the one shown in figure 2 to report the results of their analyses to the Tariff Commission. The form in figure 2 contains the data for sample No. 335 (a New Zealand second shear wool) as reported by laboratory A. The percentages of medullated and kemp fibers in the sample were reported separately and the measurements of these fibers were included in the fiber measurements shown for each duplicate.

Figure 2.--Reporting form

UNITED STATES TARIFF COMMISSION
Investigation No. 34
REPORTING FORM

LOT NO. 335 - C

	Duplicate No. 1	Duplicate No. 2	Total or average
Average diameter (m)	34.05	33.98	34.02
Standard deviation (σ)	9.47	9.15	9.31
Coefficient of variation (%)	27.81	26.92	27.36
Number of fibers measured	800	800	1600
Medullated fibers (%)	5.75	10.00	7.88
Kemp fibers (%)	-	-	0
Fiber distribution (%)			
0 - 5.0			
5.1 - 10.0			
10.1 - 15.0	0.62	0.25	0.43
15.1 - 20.0	4.12	5.12	4.62
20.1 - 25.0	14.88	13.00	13.94
25.1 - 30.0	17.38	15.63	16.50
30.1 - 35.0	19.12	21.88	20.50
35.1 - 40.0	16.50	18.63	17.57
40.1 - 45.0	14.12	12.62	13.37
45.1 - 50.0	8.00	8.12	8.06
50.1 - 55.0	3.88	3.75	3.82
55.1 - 60.0	0.88	0.75	0.82
60.1 - 65.0	0.50	0.25	0.37
65.1 - 70.0			
70.1 - 75.0			
75.1 - 80.0			
80.1 - 85.0			
85.1 - 90.0			
90.1 - 95.0			
95.1 - 100.0			
100.1 and over			

COMMENTS: (Include range in diameter of fibers over 100 microns). Continue comments on reverse side if necessary.

LABORATORY "A"

DATE

SIGNATURE

The basic data reported to the Tariff Commission by the three laboratories and used by the Commission for its calculations were converted to a uniform format and are contained in tables 2, 3, and 4. All data reported to the Commission are included in this report for reference purposes, since information of this type has not been generally available, especially for some of the less common wools.

Tables 2, 3, and 4 are each divided into two sections. The first section in each table is limited to unimproved wools. The second section lists the improved wools grouped according to the official tariff classification assigned by a customs examiner. A detailed description of other characteristics of each lot is also given in these tables.

ANALYSIS AND INTERPRETATION OF DATA

Three lines of inquiry are presented in the sections which follow. The first of these is concerned with improved and unimproved wools and the means by which they may be distinguished under either the micron or the visual method of grading. The second is concerned with the comparison of the micron and visual grades obtained on 80 samples of improved wools and, the third, with the reliability of the micron method of grading wool. Also examined is the adequacy of hand sampling for micron grading.

Distinction Between Unimproved and Improved Wools

In their original native state, sheep possessed an outer coat of coarse guard hairs that covered finer downy wool. This combination of fibers protected the sheep against weather and skin abrasion in the rough country in which they roamed. Sheep with substantial quantities of guard hair are still the only sheep found in many of the less developed areas of the world. Such sheep have not changed to any substantial degree over the centuries; they are essentially the same as the sheep of Biblical times. The term "unimproved wool" refers primarily to wool from such sheep. It is "wild" and variable in character and has many long, coarse fibers.

The "named" and "similar" wools provided for in paragraph 1101 of the Tariff Act of 1930, are unimproved wools. 1/ There are other wools

1/ Black Spanish wool is an exception. Although named in par. 1101, it is generally regarded as an improved wool. This fact is of no consequence in the present investigation, since Black Spanish wool has not been imported into this country for years. Karakul, on the other hand, is regarded as unimproved despite the fact that it is obtained from a type of sheep that has experienced selective breeding to produce better lambskins. The wool itself is a coarse black wool of highly variable fiber diameter that is classified as "similar" to Egyptian wool for customs purposes.

that are unimproved wools but cannot qualify as "named" and "similar" wools. 1/ These wools, which are designated "other wools of whatever blood or origin" in the Tariff Act of 1930, must be classified by grade since there is no other classification applicable to them (table 1).

Certain other types of wool which are generally similar in fiber-diameter variability to the unimproved wools described above have been developed and are imported into the United States. They are classified as unimproved wools in this report. One of these types of wool is a mixture of "named" wools and low-grade wools obtained from improved wool fleeces. Cordova blends from Argentina are well-known examples of this type. They are mixtures of Cordova (a named wool) and low-grade pieces from the necks, flanks, britch, and other less desirable parts of improved wool fleeces; they are generally intended for use in carpets. Samples of five lots of such mixtures were obtained during the investigation. Another type similar to unimproved wool in fiber-diameter variability is the carpet blend, which consists of pieces of various types of wool that are blended and sold, under trade names, for use in carpets. In this category are Mazumet blends 2/ and Holland blends. Such blends, eight samples of which were obtained during this investigation, are noteworthy for the extreme variation found in their fiber diameter.

1/ The named wools are identified in the act itself. Wools can be regarded as similar if they have the same appearance as named wools and if they contain no merino or English blood. Crimp, or waviness, in the fibers is regarded as evidence of such blood or breeding.

2/ Mazumet is a wool-pulling center in France where wool is removed from the pelts of slaughtered sheep.

As used in this report, therefore, the term "unimproved wool" refers to (a) wools which are naturally wild and variable in character and (b) mixtures and blends of variable wools prepared abroad for sale, generally to carpet manufacturers, in the United States.

In contrast to "unimproved wool," the term "improved wool" as used in this report refers to wool from breeds of sheep that have changed considerably over the centuries as a result of selective breeding. The Spanish merino and the English breeds, prominent about 150 years ago, constitute the foundation for almost all the modern breeds of sheep which have been improved by breeding. Improved wool is distinguishable from unimproved wool by its uniformity of fiber diameter, crimp (waviness), softness, good color, and other factors.

Since the characteristics of wools produced by the same breed of sheep differ with climate, topography, feed, and local husbandry, improved wools, like the unimproved wools, are usually identified by country or area of origin and generally by some indication of grade and type, rather than by breed. The samples of both improved and unimproved wools collected during this investigation are so identified in this report; their identification is supplemented by other information deemed pertinent.

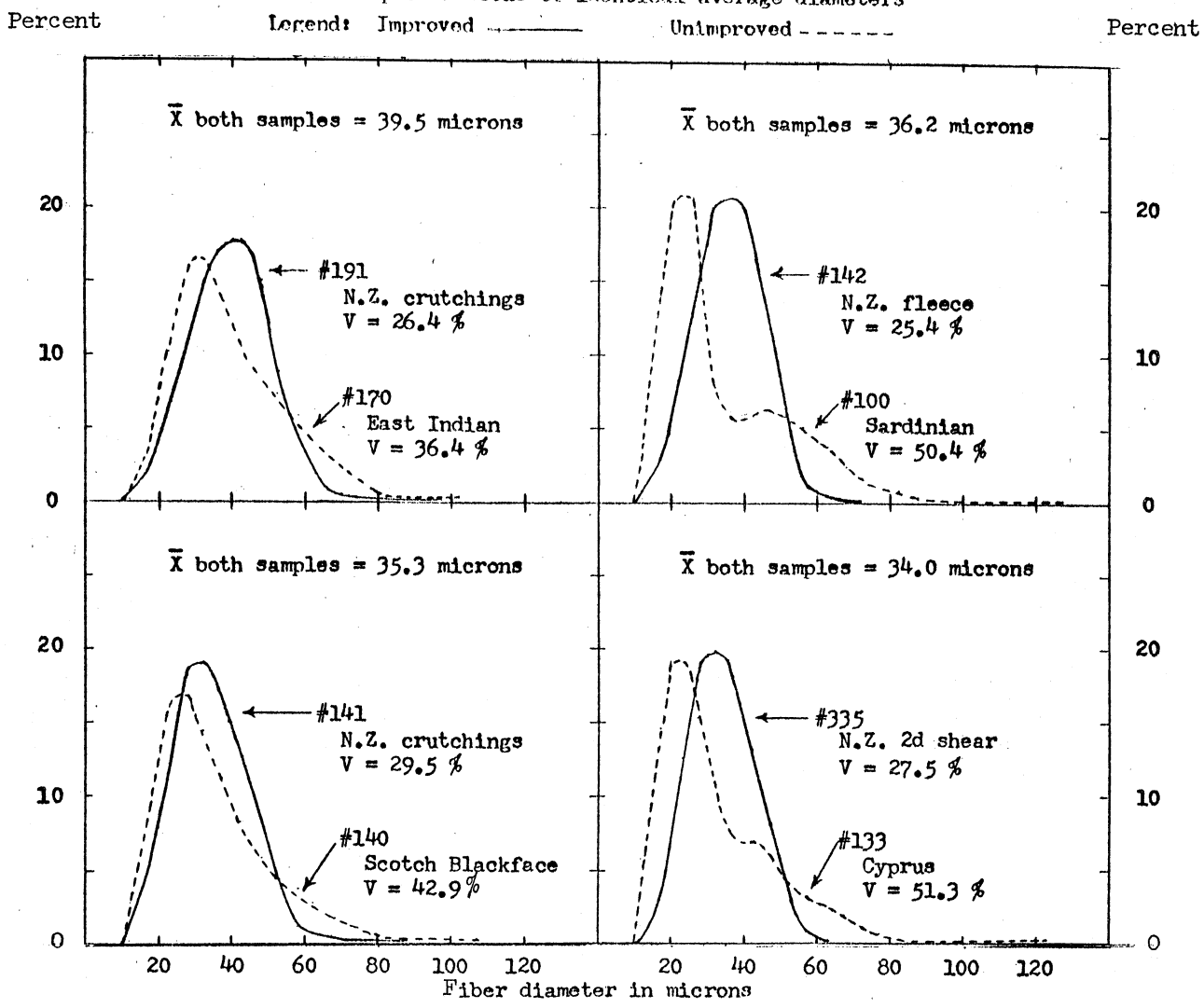
Methods of distinguishing between wools

Improved wools can be readily distinguished from unimproved wools by differences in the variability of their fiber diameters. Not only is the difference in fiber-diameter variability between these two groups of wools apparent on visual inspection to one familiar with wool, but it can also be measured, under the micron method, by the coefficient of variation. 1/

1/ The coefficient of variation is defined in app. B.

Fiber-diameter distributions for typical unimproved and improved wools of identical average diameter tested by laboratory A are presented in figure 3. They illustrate both graphically and in statistical terms the basic differences in variability of fiber diameter that exist between improved and unimproved wools.

Figure 3.--Comparative fiber diameter distribution of imported improved and unimproved wools of identical average diameters



Note on symbols.--$\bar{X}$ = mean or arithmetic average, and V = coefficient of variation.

All the wools sampled in this investigation which on a visual basis were found to be unimproved are listed in tables 5A, 5B, and 5C. All the wools sampled which on a visual basis were found to be improved are listed in tables 6A, 6B, and 6C. The coefficients of variation for each individual sample, computed from the data reported by each of the three laboratories, are also shown in these six tables. All samples of improved wool have coefficients of variation less than 33 percent and all samples of unimproved wool have coefficients of variation greater than 33 percent. The coefficient of variation of 33 percent therefore is a dividing line between improved and unimproved wools. The average of the coefficients of variation was 46 percent for the 66 lots of unimproved wools and 27 percent for the 80 lots of improved wools. 1/

In addition to differences in the variability of fiber diameter, an important distinction between most improved and unimproved wools is the difference in the percentage of kemp fibers in the wools. Most unimproved wools have a significant percentage of kemp fibers, whereas improved wools generally have only a very small percentage. Laboratory A, for example, found that 61 of the 66 lots of unimproved wools it tested contained 0.5 percent or more of kemp fibers, but that only 3 of the 80 lots of improved wools it tested contained that great a percentage of kemp fibers (table 2). Although the proportions of kemp fibers in these two groups differ significantly from an overall point of view, no specified percentage of kemp can be used to distinguish between improved and unimproved wools with the degree of reliability which is obtained by

1/ Based on results submitted by laboratory A.

the use of the coefficient of variation, since some improved wools had a higher percentage of kemp fibers than some unimproved wools. For similar reasons, the percentage of medullated fibers to the total number of fibers in a sample cannot be used to distinguish reliably between the two types of wool.

Differences between laboratory test results for unimproved wools

The measurements of unimproved wools reported by the three laboratories often differed significantly for the same lot of wool. The greatest differences between laboratory results for these wools occurred between the results reported by laboratory A and those reported by laboratory C. Somewhat smaller differences were noted in comparing the results of laboratories A and B. The differences appear to be attributable largely to the use of different methods of measuring kemp fibers described in the section on measurement procedures followed by the laboratories, since the greatest differences were found where the amount of kemp in the sample was large. Thus, there were large differences between the standard deviations obtained by laboratories A and C for unimproved wool samples (tables 5A and 5C). These differences were found to be strongly correlated with the percentage of kemp in the samples. The correlation coefficient was 0.75.

Fineness of unimproved wools

Unimproved wools cannot be graded visually with a high degree of precision because their fiber diameters are highly variable. Most imported wools of this type, however, are not required to be graded. The named and similar wools need only to be identified as such under the provisions of paragraph 1101 of the Tariff Act of 1930 to qualify for

duty-free entry, or, if they are not to be used for carpets or other selected duty-free uses, for the lowest rates of duty applicable to any type of wool (table 1). However, mixtures and blends, which constitute most of the remaining part of the unimproved wools imported into the United States, must be classified by visual grade as best it can be done.

As one result of this study micron data are available which indicate the fineness of unimproved wools. The tariff grades that were obtained from the application of the micron system to named and similar wools, mixtures, and blends, based on the results obtained by laboratory A, are presented below (by number of samples):

Visual classification	Micron grades 1/				Total
	nf/40s	44s	46s	f/46s	
Named and similar	13	8	8	24	53
Mixtures	-	1	1	3	5
Blends	1	-	2	5	8
Total	14	9	11	32	66

1/ The grades abbreviated in this tabulation are defined on p. 10.

The average fiber diameters of the unimproved wools, and the tariff grades related thereto, were found to be much finer than they are generally considered to be. Mongolian wools were found to be about 58s, the finest of the unimproved wools. In addition, the Mongolian wools were noteworthy for their extreme variation in fiber diameter. (Their coefficients of variation ranged from 62 to 68 percent.) Scotch Blackface wools, on the other hand, were coarse (most of them were nf/40s). They had a variation in fiber diameter which, while considerable, approximated the average for all unimproved wools; their coefficients of variation (based on test results from laboratory A) ranged from 43 to 51 percent.

The number of samples of mixtures and blends that are finer than 46s in the preceding tabulation is significant for duty purposes. Although the 13 samples of mixtures and blends covered in the tabulation were officially (visually) classified as not finer than 40s, 8 of the 13 lots would not have qualified for duty-free use if the proposed micron grades had been the official standards because, on the basis of micron grading, they were finer than 46s. 1/ These 8 lots are the only lots of unimproved wools in the tabulation whose dutiable status would have been changed had the micron standards used in this report been in effect, since they are the only unimproved wool samples which are classified for duty purposes on the basis of grade.

Comparison of Micron and Visual Classification Systems for Improved Wools

In contrast with most unimproved wools, all improved wools that are imported must be classified by grade for duty purposes. While many grades are commercially recognized, only four are presently used for tariff classification: (1) Not finer than 40s; (2) finer than 40s, not finer than 44s; (3) finer than 44s, not finer than 46s; and (4) finer than 46s. Although the micron grades provided for in the micron standards which the Department of Agriculture is planning to propose for official use are more numerous, they would be converted to the above tariff grades if the micron standards were adopted for the purpose of tariff classification. The present system of classifying wool for customs purposes, which involves a visual inspection of the wool with

1/ Only named and similar wools and all other wools not finer than 46s can be imported duty-free, under bond, for carpets and certain other specified uses.

reference to the U.S. Department of Agriculture standards of 1926, has been discussed in the section on U.S. tariff classification of wool.

Micron grading

Micron standards are the only official standards now in effect for all grades of wool top. 1/ Official micron specifications for raw wool, grades 50s through 80s, inclusive, were released by the Department of Agriculture in November 1942 for optional use only, in place of the visual standards of 1926. 2/ At present there are no official standards for micron grading of wools coarser than grade 50s. The Tariff Commission report of September 1959 based its discussion of micron grading of wools coarser than 50s on specifications prepared by the American Society for Testing and Materials.

The U.S. Department of Agriculture has developed considerable information on the micron analysis of wool in recent years. The Department has indicated that it is planning to propose micron grade specifications on wool which, if adopted for official use, would supplant all present visual and micron grade standards now in effect. The average fiber diameter limits for each numerical grade in those standards are virtually the same as the ASTM specifications which the Commission used in its 1959 report. These new U.S. Department of Agriculture specifications, upon which this report is based, are as follows: 3/

1/ Wool top is a continuous untwisted strand of longer wool fibers from which the shorter fibers or noil have been removed by combing. Wool top is dutiable as such and need not be classified by grade for duty purposes.

2/ While these specifications for optional use have been applicable to the tariff classification of imported wool since 1960 they have not been used in practice, since all wools finer than 46s are dutiable at the highest rate.

3/ The standards set forth testing procedures and also include other specifications in addition to average fiber diameter.

Numerical grade	Limits for average fiber diameter (microns)
Finer than 80s	17.69 and smaller
80s	17.70-19.14
70s	19.15-20.59
64s	20.60-22.04
62s	22.05-23.49
60s	23.50-24.94
58s	24.95-26.39
56s	26.40-27.84
54s	27.85-29.29
50s	29.30-30.99
48s	31.00-32.69
46s	32.70-34.39
44s	34.40-36.19
40s	36.20-38.09
36s	38.10-40.20
Coarser than 36s	40.21 and larger

The micron tariff classifications which correspond to the above numerical micron grades are as follows:

Tariff classification	Limits for average fiber diameter (microns)
Finer than 46s	32.69 and smaller
46s	32.70-34.39
44s	34.40-36.19
Not finer than 40s	36.20 and larger

Differences between visual and micron grades for improved wools

On the basis of the results of micron tests performed by the three laboratories (tables 6A, 6B, and 6C), tariff grades were assigned to each lot of improved wool tested in this investigation. The visual grade and the micron grades obtained for each lot tested by the laboratories are presented in table 6E. The extent of agreement between the visual and

micron grades applicable to these improved wools is summarized below: 1/

Visual grade	Tariff grade, as determined by micron analysis				
	nf/40s	44s	46s	f/46s	Total
Laboratory A					
Nf/40s	25	13	4	1	43
44s	14	5	1	1	21
46s	2	2	4	-	8
F/46s	-	1	3	-	4
Total	41	21	12	2	76
Laboratory B					
Nf/40s	18	9	5	1	33
44s	12	5	2	1	20
46s	1	2	3	2	8
F/46s	-	-	4	-	4
Total	31	16	14	4	65
Laboratory C					
Nf/40s	12	21	9	1	43
44s	9	7	3	2	21
46s	-	3	4	1	8
F/46s	-	-	4	-	4
Total	21	31	20	4	76

The tabulation shows that there was agreement between visual and micron grades for only about three-eighths of the improved wools tested by the laboratories. The extent of this agreement was significantly greater for laboratories A and B (40 percent or more) than for laboratory C (30 percent). The extent of agreement was also significantly greater for the coarser wools than for the finer ones. On the average, about 46 percent of the lots with a visual grade of not finer than 40s had the

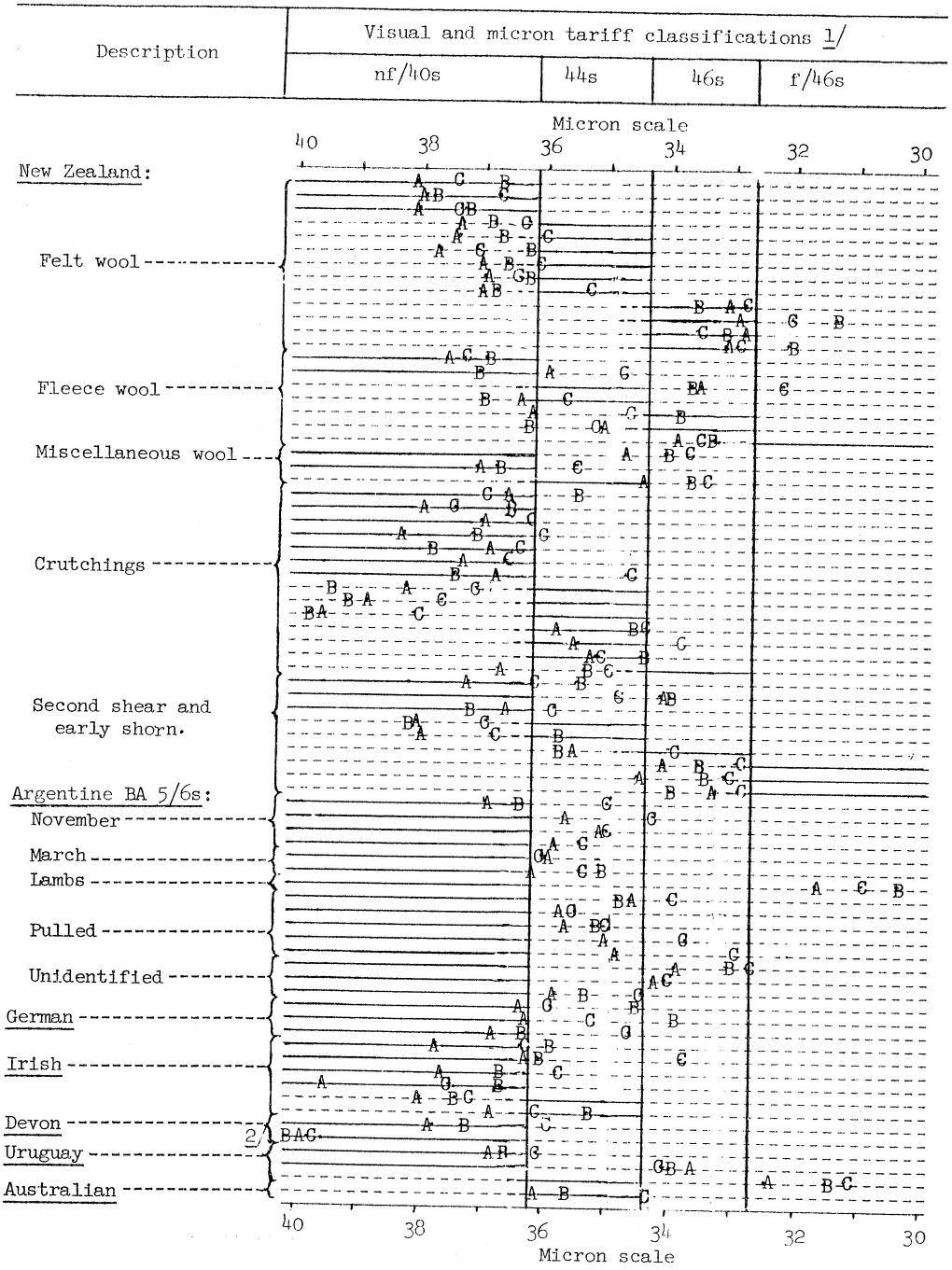
1/ Four of the 80 lots of improved wools were of mixed visual grade and are not included in the tabulation. The results of the micron tests for improved wools are also presented, in table 6D, on the basis of the more numerous numerical grades.

same micron grade and about 59 percent of the lots with a micron grade of not finer than 40s had the same visual grade. In contrast, only about 28 percent of the lots with visual grades finer than 40s had the same micron grades and about 22 percent of the lots having micron grades finer than 40s had the same visual grades.

The data summarized in the above tabulation are graphically portrayed for each individual sample in figure 4. Figure 4 is vertically divided into four sections, or columns, each of which represents one of the four tariff grades for wool. Each wool sample is shown as a horizontal solid and dashed line. The samples are grouped on the chart by country or origin and by type. The position of the average fiber diameter of each sample, as determined by each laboratory, is indicated on the horizontal line by the appropriate letter. These letters are plotted to the micron scales given at the top and bottom of the figure. Only in that section of the chart which coincides with the visual grade of the sample is the horizontal line solid; in the other sections it is a dashed line. When the visual grade and the micron grade for a sample are identical, the letter for the micron grade appears on the solid line; when they do not agree, the symbol appears on the dashed line.

Thus in figure 4 the relationship between the visual grades that were assigned by the customs examiners and the micron grades obtained by the three laboratories on each sample can be clearly seen. One significant trend is detectable in the disparities between visual and micron grades depicted in figure 4. All 15 lots of Argentine BA 5/6s wools were visually graded as not finer than 40s. When graded on a micron basis, however, 13 of these lots (according to results for laboratory A)

Figure 4.--Improved wools: Official visual classification of the Bureau of Customs, and micron tariff classification based on average fiber diameters as determined by 3 laboratories, by types of wool samples



1/ Solid line (——) denotes visual grade as determined by U.S. Bureau of Customs. The letters A, B, and C, which are plotted using the micron scale, indicate both the average fiber diameter and the tariff classification obtained from the results of the respective laboratories.

2/ The average diameters obtained for this sample by the 3 laboratories were larger than 40 microns. The diameters obtained are given in tables 6A, 6B, and 6C.

Note.--This chart enables 2 types of comparisons to be made for each of the 80 improved wools plotted therein: (1) the extent of agreement between laboratories in their determination of the average fiber diameters of the samples and the corresponding tariff classifications on a micron basis; and (2) the extent of agreement between the tariff classifications visually assigned by the Bureau of Customs and those based on the micron data of the 3 laboratories. With one notable exception, there were no consistent patterns in the differences between visual and micron classifications; however, virtually all the Argentine BA 5/6s were visually assigned grades coarser than those based on the micron tests.

were finer than 40s: 10 of them were 44s, 2 were 46s, and 1 was finer than 46s. Although the micron grades of BA 5/6s were significantly finer than the visual grades, all but 1 of the 15 samples tested would nevertheless have qualified for duty-free entry under the micron grading system. 1/

The largest group of wools tested in this investigation consisted of New Zealand wools. The micron grades for these wools were generally coarser than the visual grades: 22 lots had the same visual and micron grade (according to results for laboratory A), 20 had micron grades that were coarser than the visual grades, and only 4 had micron grades that were finer than the visual grades.

Only 15 wools listed in figure 4 were not from Argentina or New Zealand. Two-thirds of those wools (based on test results from laboratory A) received identical micron and visual grades.

Reliability of Micron Grading

The reliability of micron grading is evaluated in two ways in this section. First, the internal consistency of the results obtained on each sample within each laboratory is examined and evaluated through comparisons of duplicates. Since all the tests performed by each laboratory on each sample were in duplicate, many such comparisons were made. Second, the results for each sample reported by the different laboratories are compared. Fewer comparisons can be made for this second measure of reliability than for the first measure described above because (a) only

1/ Wools not finer than 46s are free of duty when used for carpets and other limited purposes.

wools containing little or no kemp, that is, mainly improved wools, can be included, 1/ and (b) not all laboratories tested all improved wool samples.

Internal consistency

Chi-square and "t" tests are used in this report to assess the internal consistency of sample results. 2/ The "t" test measures how well the average fiber diameter of the duplicates of a sample agree. In general, a sufficient number of fibers are measured so that the average diameter of the duplicates of an improved wool sample will ordinarily be within about 0.5 micron of each other. If the duplicates of each sample were treated alike, less than a fifth of the differences between duplicates would ordinarily be larger than 0.8 micron.

When large differences occur between the average diameters of duplicates of a sample, it is improbable that the duplicates were treated alike. 3/ For example, one of the laboratories found that the average diameters of the duplicates of sample No. 320 (New Zealand crutchings) differed from each other by 1.2 microns. A difference as large as this or larger would be expected to occur only 1 time out of 20. By itself, this does not indicate conclusively that the duplicates were treated differently. However, a judgment as to whether such differences arose by chance or resulted from different treatment afforded the duplicates can be made when all samples are considered collectively.

1/ The effect of kemp fibers on the laboratory test results is discussed on p. 22. For consistency with other sections of the report only the results for improved wools are compared between laboratories.

2/ The chi-square and "t" tests are discussed in detail in app. B.

3/ Unlike treatment of sample duplicates in all likelihood arises from laboratory error and lack of precision in laboratory measurement.

The extent of agreement between the distributions of fiber diameters of sample duplicates is measured by the chi-square test. The number of fibers in each 5-micron cell in one duplicate should, in general, be reasonably close to the number found in the corresponding 5-micron cell in the other duplicate. The probability that differences in fiber-diameter distribution of considerable magnitude would occur is small if the two duplicates were treated alike. When large differences occur they will have correspondingly smaller probabilities. As in the "t" test, large differences are not expected to arise consistently by chance unless the duplicates were not treated alike.

Distribution of individual sample probabilities.--The probabilities derived from the application of the "t" and chi-square tests to the core sample data are given in table 7. As expected, there is wide variation in the size of the probabilities. 1/ They have been grouped below, for purposes of discussion, into probability intervals of 20 percent each. Provided the duplicates in each sample were treated alike, about one-fifth of the samples tested should fall into each of these intervals.

Unimproved wools.--The probabilities in table 7, which relate to the data reported by the three laboratories for unimproved wools, are distributed as follows:

1/ Some of this variation is "expected," because differences between duplicates, to which the probabilities are related, that are supposed to occur only 1 time in 10 do occur, on the average, just about that often when sample duplicates are treated alike.

Probability interval	Laboratory A			Laboratory B			Laboratory C		
	Expected number	Actual number		Expected number	Actual number		Expected number	Actual number	
		Chi-sq.	"t"		Chi-sq.	"t"		Chi-sq.	"t"
0 to 20 percent	13.2	16	14	11.2	22	17	13.2	23	17
21 to 40 percent	13.2	9	11	11.2	14	6	13.2	15	10
41 to 60 percent	13.2	12	13	11.2	8	10	13.2	15	13
61 to 80 percent	13.2	14	17	11.2	3	14	13.2	7	12
81 to 100 percent	13.2	15	11	11.2	9	9	13.2	6	14
Total-------	66	66	66	56	56	56	66	66	66

A comparison of the actual and expected distributions of probabilities in the tabulation above shows that laboratory A's results for unimproved wools are much more consistent, or reliable, than are those of the other laboratories. The distribution of probabilities for laboratory A was close to expectations; that is, the duplicates for that laboratory agreed with each other about as well as could be expected. The test results of the other two laboratories, however, tended to cluster in the lowest probability interval (0 to 20 percent). The clustering was definitely significant, however, only for the chi-square probabilities; that is, there were many more large differences between duplicates in the number of fibers per cell than would have been expected.

Improved wools.--The probabilities in table 7 which relate to the data reported by the three laboratories for improved wools, are distributed as follows:

Probability interval	Laboratory A			Laboratory B			Laboratory C		
	Expected number	Actual number		Expected number	Actual number		Expected number	Actual number	
		Chi-sq.	"t"		Chi-sq.	"t"		Chi-sq.	"t"
0 to 20 percent	16	18	28	13	38	23	16	30	27
21 to 40 percent	16	23	19	13	13	15	16	17	19
41 to 60 percent	16	13	13	13	6	10	16	9	11
61 to 80 percent	16	17	9	13	7	10	16	15	15
81 to 100 percent	16	9	11	13	1	7	16	9	8
Total	80	80	80	65	65	65	80	80	80

Except for the chi-square probabilities for laboratory A, there is considerable clustering within the lower probability levels for these improved wools, indicating that large differences between means of duplicate samples occurred more frequently than expected. Inasmuch as the distribution of probabilities for improved wools deviates from its expected distribution to a greater degree than does the distribution of probabilities for unimproved wools, it is apparent that test results for improved wools were definitely of lower internal consistency, or reliability, than were those for the unimproved wools.

All wools.--The combined distribution of probabilities for both unimproved and improved wools is as follows:

Probability interval	Laboratory A			Laboratory B			Laboratory C		
	Expected number	Actual number		Expected number	Actual number		Expected number	Actual number	
		Chi-sq.	"t"		Chi-sq.	"t"		Chi-sq.	"t"
0 to 20 percent	29.2	34	42	24.2	60	40	29.2	53	44
21 to 40 percent	29.2	32	30	24.2	27	21	29.2	32	29
41 to 60 percent	29.2	25	26	24.2	14	20	29.2	24	24
61 to 80 percent	29.2	31	26	24.2	10	24	29.2	22	27
81 to 100 percent	29.2	24	22	24.2	10	16	29.2	15	22
Total	146	146	146	121	121	121	146	146	146

From the tabulation above, it is readily apparent that an excessive number of test results fell in the lowest probability interval (0 to 20 percent). The occurrence of improbable results significantly in excess of the number that were expected indicates that, in all likelihood, some samples were subject to error and lack of precision in measurement. However, there is no way of identifying the particular samples that were so affected.

Group probabilities.--Probabilities have been calculated for the improved wool samples as a group, for the unimproved wool samples as a group, and for both combined, for each laboratory. These probabilities are used to assess the significance of differences between duplicates of samples when those differences are considered as groups. These group probabilities, the size of which also reflect the distribution of individual sample probabilities noted above, are distributed as follows (in percent):

Laboratory	Unimproved		Improved		Total	
	Chi-square test	"t" test	Chi-square test	"t" test	Chi-square test	"t" test
A	63	23	5	4	20	2
B	1/	42	1/	1/	1/	1/
C	1/	14	1/	1/	1/	1/

1/ Less than 1 percent.

These chi-square and "t" probabilities support the findings previously made that the test results for unimproved wools are more reliable than are those for improved wools, and that the test results for laboratory A conform more closely to theoretical expectations than do those for the other two laboratories.

The probabilities that relate to both improved and unimproved wools considered as a group are shown, by laboratory, under the heading "Total." The 20-percent chi-square probability under that heading indicates that the differences between duplicates for all samples tested by laboratory A were generally of sizes that could be expected to occur one time out of five. On the other hand, the 2-percent probability shown for "t" tests performed by laboratory A indicates that the difference in average fiber diameter between the two sets of sample duplicates is so large that the probability that it occurred by chance is only 1 in 50.

The chi-square and "t" probabilities for all samples tested by the other two laboratories were less than 1 percent. The differences between sample duplicates to which those probabilities relate are therefore so large that their occurrence cannot reasonably be attributed to chance; rather, they should be attributed to differences in the manner in which the duplicates were tested.

Another way of demonstrating the differences between the three sets of test data is to consider the effect of eliminating a few selected samples. Such arbitrary exclusion of extreme test results would not of course, generally be considered good practice. It does demonstrate, however, the differences that exist between the results that were obtained from the three laboratories. The elimination of only 5 percent of the samples with the lowest individual probabilities would materially increase the probabilities for all samples considered as a single group shown in the tabulation for laboratory A on page 43. The distribution of individual

sample probabilities for "all wools" shown for that laboratory on page 42 would also agree more closely with the number expected for that laboratory. More than 15 percent of the samples having the lowest individual probabilities would have to be eliminated, however, before the distribution of individual probabilities and the level of group probabilities for the other two laboratories could approximate the new distribution and levels of group probabilities for laboratory A.

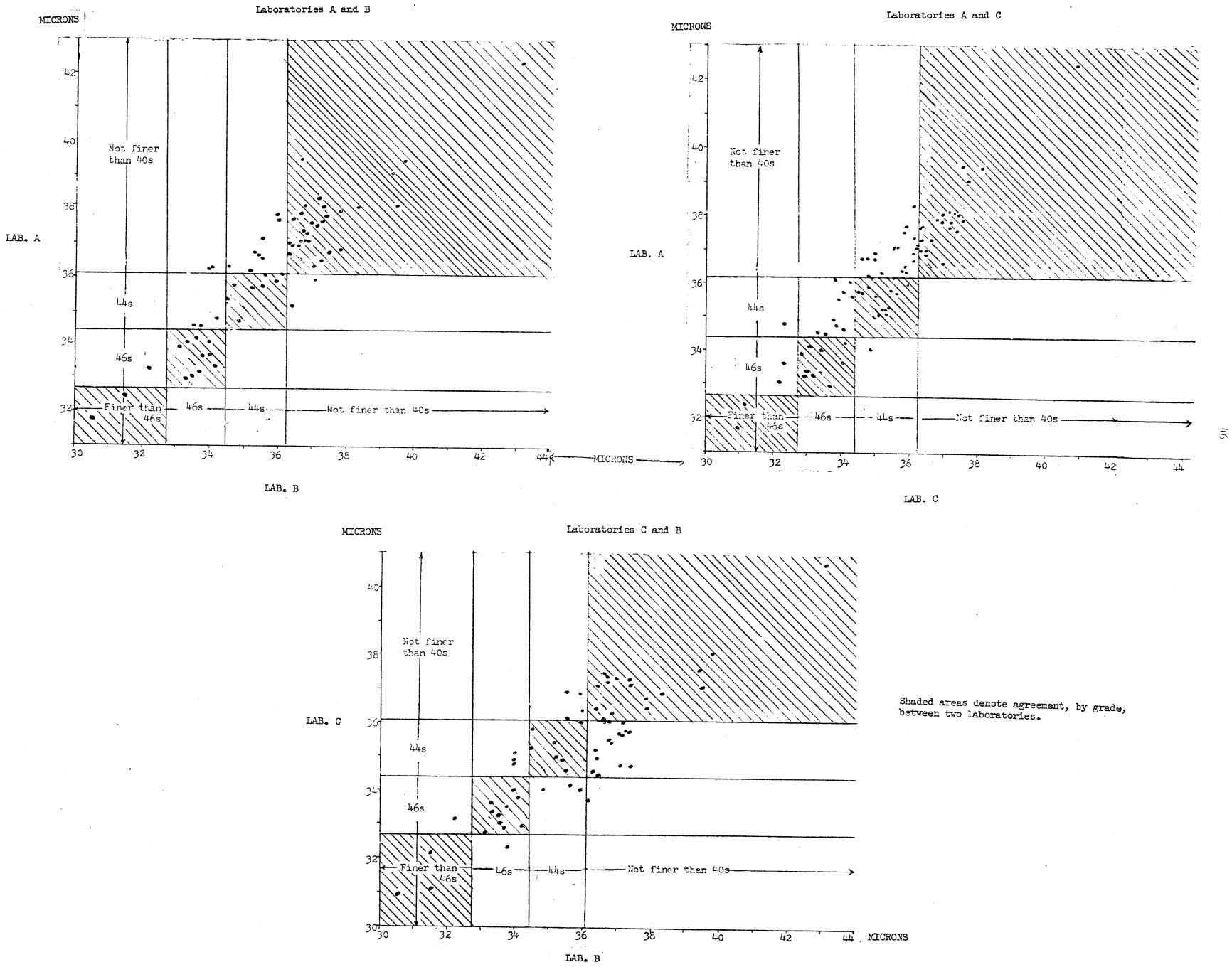
Agreement between laboratories

Tariff grades based on the results of micron analysis performed at different laboratories are compared in this section to determine the extent to which the laboratories agreed on the grade of improved wools. Comparisons are limited to improved wools since only those wools contain little or no kemp (see p. 29). 1/

The extent of tariff-grade (as well as micron-diameter) agreement between laboratories for samples of improved wool is shown in figure 5. Figure 5A compares the average fiber diameter measurements obtained for 65 improved wool samples by laboratories A and B. The scales along both the vertical and horizontal axes are in microns; the tariff grades are delineated by lattice lines and labeled within the chart itself. Consequently, interlaboratory comparisons of both the average fiber diameter and tariff grade obtained on each sample can be made. When a sample is within a shaded area it indicates that the two laboratories

1/ Moreover, comparisons of data for unimproved wools are not considered essential since those wools are usually entered free of duty, and they are not generally graded. Also, except for mixtures and blends, unimproved wools would continue to be classified on a visual basis even if a micron grading system was adopted for classification purposes.

Figure 5.--Improved wool samples: Comparisons between laboratories of results of micron analysis



Shaded areas denote agreement, by grade, between two laboratories.

agree on grade. Figures 5B and 5C present similar comparisons for laboratories A and C, and B and C, respectively. The extent of grade agreement between laboratories for improved wools on a tariff classification basis is as follows: 1/

Laboratories	Percent of the samples
A and B	74
A and C	56
B and C	58
Average	62

Even when laboratory performance is perfect in all respects, complete grade agreement between laboratories would not be expected. The sharp dividing lines that exist between tariff grades place a maximum limit of about 90 percent on the extent to which any two laboratories would agree on tariff grades. This inability to achieve perfect agreement results from the fact that there will always be some variation between successive tests on any sample, even when measurement procedures are identical. Laboratory test results falling on opposite sides of a given dividing line will often be obtained by the different laboratories (and even by the same laboratory upon retesting the same sample) for samples whose actual average diameters are near the dividing line between two grades (i.e., within 0.4 micron of a grade line). The 5th and 7th samples in figure 4 are illustrative of samples that fall on opposite sides of a dividing line.

The average micron diameter determined for all improved wool samples tested by laboratory A was 0.53 micron coarser than the average micron diameter for the improved wool samples tested by laboratory B, and

1/ Grade agreement based on the numerical grades (table 6D) was 66, 49, 52, and 55 percent, respectively, for the same laboratory comparisons presented in the tabulation.

laboratory C's diameter measurements were determined to be, on the average, 0.46 micron finer than those obtained by laboratory B. These overall average micron-diameter differences between laboratories, statistically termed "bias," are reflected in figure 5A by the tendency for the dots to fall on the coarser part of the micron scales for laboratory A and on the finer side for laboratory B. These diameter differences arise because of differences in laboratory measurement techniques (e.g., slight differences in equipment and magnification, and differences in the selection of fibers to be counted and measured). Some differences in laboratory results due to bias were expected since provision had not been made for complete uniformity between laboratories in test standards and procedures. Greater uniformity is to be expected as more experience in this field is gained; this improvement in testing techniques would eliminate or reduce many of the differences between laboratory results. 1/

Statistical analysis indicates that the elimination of the biases described above would raise the extent of grade agreement between any two laboratories from the present 62 percent to 70-75 percent. Further, the more uniform testing procedures would probably be accompanied by some increase in the precision of measurement within the laboratories. Consequently, it would appear that interlaboratory agreement on tariff grades of improved wools would ultimately exceed 75 percent under a micron

1/ Many of the differences in test results, both within and between laboratories, reflect the fact that one of the three laboratories has had considerably more experience in the micron grading of coarse wools than have the other two laboratories.

grading system. An even further increase would also result if there was a significant increase in the number of fibers measured per sample.

Hand Sampling

The residues from core samples that were taken to determine the clean content of wools are considered representative of the lots of wool from which they were selected. They are therefore considered satisfactory for micron analysis. 1/ Hand samples, on the other hand, are not ordinarily used in conjunction with micron analysis. Nevertheless, a small number (15) of the hand samples taken during the investigation were subjected to micron analysis to determine their adequacy for that purpose. 2/

The procedures by which the hand and core samples were obtained are described in the section on procedures followed in obtaining and analyzing wool samples. The hand samples were subsampled for comparison with the core samples by compressing each hand sample into a miniature package or bale and then coring it. These cores were drawn in duplicate and were separately scoured and mixed at each of the two participating laboratories. The procedure subsequently followed in measuring the

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1/ E. M. Pohle and others, Relationship of Fineness in Wool Top, Noil, Card Sliver, and Grease Wool, U.S. Department of Agriculture, 1952, and Core-Sampling Grease Wool for Fineness and Variability, U.S. Department of Agriculture, 1954.

2/ It was originally intended to have micron tests performed on half of the 146 hand samples. As work progressed, however, it became evident that little further testing of hand samples was needed and that its continuance would reduce the number of core samples that could be tested in time for inclusion in the September 1959 report. Consequently, micron testing of hand samples was discontinued, and hand samples from only 8 lots of wool were analyzed by laboratory B and only 15 (including the same 8 lots) were analyzed by laboratory A. Laboratory C did not participate in this phase of the investigation.

diameter of the fibers in the cored hand samples is the same as that already described, beginning on page 21. The basic micron data obtained from these hand samples are presented in table 8.

Two distinct steps were involved in appraising the adequacy of hand samples for micron analysis. The first was that of determining whether the micron test results for the cored hand sample duplicates were internally consistent. The internal consistency of these results is determined by applying to them the "t" and chi-square tests presented in appendix B and previously discussed in connection with core samples. 1/ It is sufficient to note here with regard to these tests that (a) only 2 low probabilities (probabilities that are 5 percent or less) were obtained for the 46 "t" and chi-square tests and, of course, 2 (which is about 5 percent of 46) were expected with that number of tests; and (b) the probability results for the samples as groups were not out of line with expectations (the chi-square and "t" probabilities were .37 and .46 for laboratory A and .63 and .16 for laboratory B, respectively). The hand samples were therefore considered to be internally consistent.

The second step in determining the adequacy of the hand samples was that of comparing the micron analysis results for those samples with the test results obtained directly from the core samples taken from the same lots of wool. Inasmuch as core samples, quite apart from the present analysis of them, are generally considered representative of the lots of wool from which they are obtained, the micron analysis results on

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1/ The differences between the duplicates of hand samples No. 331, No. 351, and No. 375 as originally tested by laboratory A were quite large. For those three samples the analysis is based on retest data.

these 15 core samples were likewise considered representative of the lots from which they were drawn. Therefore, if the variation between the micron results for hand and core samples is no greater than can be ascribed to chance, it can be concluded that hand samples also are adequate for micron analysis.

Comparisons of the micron data for hand samples with those for core samples definitely showed that the hand samples were inferior to the core samples for micron analysis. These comparisons showed (a) that the differences between the micron analysis results for the hand samples tested both by laboratories A and B were too great for both sets of results to be accepted as representative of the same lots of wool (indicated by data in columns 10, 11, and 12 of table 9); (b) that many extreme differences existed between the measurements of the hand and core samples on the individual lots tested by laboratories A and B (indicated by data in columns 7, 8, and 9); and (c) that, as a group, the differences between the micron test results for hand samples and those for core samples were so large that they could not reasonably be attributed to chance but, rather, must be attributed to actual and appreciable differences between the hand samples and the core samples (shown by group probabilities in columns 7, 8, and 9). For these reasons, it was concluded that samples obtained by hand cannot be considered adequate for micron analysis of wool.

APPENDIX A

STATISTICAL TABLES

Table 1.--Tariff classification and most favored nation rates of duty in effect on wool on Jan. 1, 1958, and Jan. 1, 1962 1/

(Specific rate of duty in cents per pound of clean content)

Tariff par.	Classification	For apparel use 2/		For carpets and other uses 3/	
		Jan. 1, 1958	Jan. 1, 1962	Jan. 1, 1958	Jan. 1, 1962
1101	Named wools and similar wools: 4/				
	In the grease or washed	13	13	Free	Free
	On the skin	11	11	Free	Free
	Sorted, or matchings, not scoured	14	14	Free	Free
	Scoured	16	16	Free	Free
	All other wools:				
	Not finer than 40s:				
	In the grease or washed	13	13	Free	Free
	On the skin	11	11	Free	Free
	Sorted, or matchings, not scoured	14	14	Free	Free
	Scoured	16	16	Free	Free
1102	Finer than 40s, not finer than 44s:				
	In the grease	17	17	17	Free
	On the skin	15	15	15	Free
	Sorted, or matchings, not scoured	18	18	18	Free
	Scoured	20	20	20	Free
	Finer than 44s, not finer than 46s:				
	In the grease	25.50	25.50	25.50	Free
	On the skin	24.00	24.00	24.00	Free
	Sorted, or matchings, not scoured	26.25	26.25	26.25	Free
	Scoured	27.75	27.75	27.75	Free
	Finer than 46s:				
	In the grease	25.50	25.50	25.50	25.50
	On the skin	24.00	24.00	24.00	24.00
	Sorted, or matchings, not scoured	26.25	26.25	26.25	26.25
	Scoured	27.75	27.75	27.75	27.75
1106	Carbonized wools	27.75 5/ + 6.25% ad val.	27.75 5/ + 6.25% ad val.	27.75 5/ + 6.25% ad val.	27.75 5/ + 6.25% ad val.

1/ Does not apply to Communist-dominated countries.

2/ Includes wool used in blankets, upholstery, most industrial uses; wools used for papermakers' felts exempt from duty after July 30, 1960.

3/ Other uses are limited to knit or felt boots, heavy fulled lumbermen's socks, and press cloth and, after July 30, 1960, wools used in papermakers' felts. Wools entered free are subject to the bonding provisions of par. 1101(b) of the Tariff Act of 1930, as amended.

4/ The following wools are specifically named in paragraph 1101(a) of the Tariff Act of 1930; Donskoi, Smyrna, Cordova, Valparaiso, Ecuadorean, Syrian, Aleppo, Georgian, Turkestan, Arabian, Bagdad, Persian, Sistan, East Indian, Thibetan, Chinese, Manchurian, Mongolian, Egyptian, Sudan, Cyprus, Sardinian, Pyrenean, Oporto, Iceland, Scotch Blackface, Black Spanish, Kerry, Haslock, and Welsh Mountain. Similar wools are those which show no evidence of merino or English blood and which are similar in appearance to the named wools.

5/ The specific rate of duty is on an actual weight basis rather than on clean content.

Table 2.—**Results of micron analysis of 146 samples** of wool: Laboratory A

Sample No.	Origin	Description and customs (visual) classification 1/	Total fibers counted	Percent medullated fibers	Percent kemp fibers	Percentage of fibers in each micron cell																				
						5.00 to 9.99	10.00 to 14.99	15.00 to 19.99	20.00 to 24.99	25.00 to 29.99	30.00 to 34.99	35.00 to 39.99	40.00 to 44.99	45.00 to 49.99	50.00 to 54.99	55.00 to 59.99	60.00 to 64.99	65.00 to 69.99	70.00 to 74.99	75.00 to 79.99	80.00 to 84.99	85.00 to 89.99	90.00 to 94.99	95.00 to 99.99	100.00 and over
		UNIMPROVED																								
		Named and similar																								
241	Arg.	CORDOVA gr, shn	1,600	9.75	0.82	-:	1.6:	13.2:	24.0:	19.1:	13.0:	9.3:	6.9:	4.7:	3.3:	2.1:	1.4:	0.8:	0.3:	0.1:	0.1:	-:	0.1:	-:	-
130	Scot.	SCOTCH BLACKFACE slt, flcs	1,600	34.94	11.37	-:	2.6:	9.4:	14.3:	14.4:	10.9:	12.3:	7.7:	6.7:	4.2:	3.3:	3.5:	2.4:	1.7:	1.7:	1.2:	1.0:	1.0:	0.4:	1.3
140	Scot.	SCOTCH BLACKFACE srt, wh	1,600	30.25	8.68	-:	2.3:	9.8:	15.6:	16.7:	14.1:	11.4:	8.1:	6.1:	4.1:	4.4:	2.4:	1.9:	1.3:	.8:	.4:	.1:	.3:	.1:	.1
250	Scot.	SCOTCH BLACKFACE gr, shn, mach	1,600	39.06	8.44	-:	1.7:	10.1:	14.8:	16.7:	13.6:	10.5:	8.6:	6.0:	4.8:	2.9:	3.8:	2.1:	1.2:	1.1:	.8:	.3:	.4:	.3:	.3
451	Scot.	SCOTCH BLACKFACE slt, flcs	1,600	33.38	9.25	-:	1.8:	8.9:	14.4:	14.6:	16.6:	10.8:	7.9:	5.9:	3.6:	2.9:	2.7:	3.4:	1.5:	1.8:	1.3:	.8:	.7:	.3:	.1
375	Scot.	HASLOCK wh, gr, pul	1,600	34.00	9.88	-:	1.5:	7.7:	13.7:	16.9:	14.6:	10.4:	8.4:	8.2:	4.7:	4.5:	3.2:	3.2:	1.4:	.6:	.5:	.2:	.1:	.1:	.1
163	Eng.	WELSH MOUNTAIN flcs	1,600	12.75	3.06	-:	1.7:	10.2:	18.0:	19.9:	17.9:	14.6:	6.8:	3.5:	2.0:	1.9:	1.1:	.6:	.4:	.4:	.3:	.1:	.1:	.2:	.3
173	Eng.	WELSH MOUNTAIN wh, gr, pul	1,600	16.54	2.63	-:	.8:	7.1:	16.4:	21.8:	17.2:	12.6:	8.4:	6.7:	2.9:	2.3:	1.4:	.9:	.5:	.2:	.3:	.1:	.2:	.1:	.1
482	Ire.	WELSH MOUNTAIN scd, kpy, flcs	1,600	13.12	4.62	-:	1.9:	9.9:	19.0:	20.1:	16.8:	11.3:	7.3:	4.3:	2.3:	1.3:	1.4:	1.1:	.7:	.6:	.8:	.3:	.3:	.3:	.3
133	Malta	CYPRUS wh, flcs	1,600	18.24	3.69	-:	3.9:	16.3:	17.9:	16.3:	8.7:	7.4:	7.6:	5.4:	4.6:	3.1:	2.9:	1.9:	1.3:	.6:	.5:	.4:	.3:	.1:	.8
143	Malta	CYPRUS wh, flcs	1,600	17.44	5.87	-:	2.9:	15.7:	20.1:	14.2:	11.2:	8.1:	5.3:	5.4:	4.3:	3.1:	2.6:	2.1:	1.3:	.8:	.7:	.5:	.3:	.4:	1.0
153	Malta	CYPRUS wh, flcs	1,600	14.38	2.07	-:	2.9:	17.9:	21.8:	15.3:	10.3:	7.2:	7.8:	5.6:	3.6:	2.8:	1.6:	1.1:	.6:	.4:	.2:	.2:	.1:	.2:	.4
100	Italy	SARDINIAN lb, shn, scd	1,600	20.50	4.94	-:	1.9:	12.6:	22.6:	14.7:	7.8:	5.6:	6.1:	5.9:	6.1:	4.9:	3.8:	2.8:	1.3:	1.7:	.7:	.4:	.4:	.3:	.4
110	Italy	SARDINIAN shn, scd	1,600	11.06	3.25	-:	5.9:	22.2:	19.8:	14.1:	9.0:	5.5:	2.8:	3.0:	2.8:	2.8:	3.2:	3.2:	1.6:	1.3:	.6:	1.1:	.4:	.3:	.4
211	Syria	ALEPPO flcs, scd 2/	1,600	8.88	.94	-:	2.0:	16.0:	21.0:	17.1:	13.3:	8.1:	6.4:	6.3:	3.1:	2.8:	1.4:	.8:	.4:	.4:	.3:	.1:	.1:	.1:	.3
221	Syria	ALEPPO gr, scd 2/	1,600	10.06	.32	-:	2.3:	13.1:	19.4:	17.1:	12.4:	10.3:	7.7:	5.8:	4.1:	2.9:	1.7:	1.4:	.4:	.3:	.5:	.2:	.1:	.2:	.1
385	Syria	ALEPPO gr, pul, wh, scd 2/	1,600	12.44	2.32	-:	1.1:	10.9:	18.5:	17.4:	11.9:	9.4:	6.1:	6.2:	4.1:	3.2:	3.4:	3.0:	1.7:	1.0:	.5:	.6:	.5:	.3:	.2
390	Syria	ALEPPO gr, pul, wh, scd 2/	1,600	10.50	1.19	-:	2.6:	12.0:	18.5:	19.1:	11.5:	9.2:	6.2:	6.5:	3.7:	3.3:	2.2:	1.6:	.7:	.9:	.6:	.3:	.1:	.1:	.9
395	Syria	ALEPPO gr, pul, wh, scd 2/	1,600	9.82	1.63	-:	2.2:	13.6:	18.6:	17.7:	12.1:	8.2:	6.8:	5.3:	3.2:	2.9:	2.8:	2.4:	1.2:	.7:	.6:	.6:	.3:	.1:	.7
480	Syria	ALEPPO flcs, lst wh, scd 2/	1,600	7.50	2.44	-:	2.9:	14.3:	21.1:	20.0:	12.1:	9.5:	5.4:	5.2:	3.3:	2.2:	.9:	1.1:	.5:	.3:	.3:	.3:	.3:	.1:	.2
260	Iraq	AWASSI (Bagdad) wh, flcs, scd 2/	1,600	6.75	.94	-:	3.9:	14.5:	20.7:	17.8:	12.1:	7.4:	6.4:	6.0:	4.1:	1.8:	1.5:	1.2:	1.2:	.4:	.2:	.3:	.4:	.1:	-
210	Iraq	AWASSI (Bagdad) wh, flcs, scd 2/	1,600	7.19	.68	-:	4.2:	15.2:	21.3:	18.1:	13.1:	8.1:	6.5:	4.4:	3.4:	2.9:	1.5:	.5:	.4:	.1:	.2:	.1:	-:	-:	-
270	Iraq	AWASSI (Bagdad) gr, pcs, fn, scd 2/	1,600	10.06	1.44	-:	4.8:	16.6:	22.0:	18.4:	11.1:	7.3:	7.1:	4.7:	2.9:	1.5:	1.1:	.9:	.6:	.4:	.3:	.1:	.1:	-:	.1
290	Iraq	AWASSI (Bagdad) wh, flcs, scd 2/	1,600	7.06	.44	-:	3.2:	12.9:	20.6:	20.1:	9.9:	10.1:	6.6:	5.5:	3.7:	3.2:	1.6:	1.3:	.2:	.4:	.4:	.2:	-:	-:	.1
230	Iran	IRANIAN (Persian) gr, pul, scd 2/	1,600	8.37	1.44	-:	1.3:	10.4:	17.0:	19.3:	13.6:	9.3:	6.8:	6.1:	4.6:	3.1:	2.9:	2.1:	.5:	1.1:	.6:	.4:	.3:	.2:	.4
251	Iran	IRANIAN (Persian) gr, pul, clp, clr, md	1,600	10.00	.50	-:	1.8:	11.1:	18.9:	15.3:	13.6:	8.6:	7.1:	6.3:	3.8:	3.4:	3.3:	3.1:	.8:	.8:	.5:	.5:	.3:	.1:	.7
282	Iran	IRANIAN (Persian) gr, pul, gry	1,600	12.75	.87	-:	.6:	7.6:	16.7:	19.7:	14.4:	10.4:	6.4:	6.5:	4.6:	4.3:	2.7:	2.1:	.3:	1.3:	1.0:	.2:	.4:	.3:	.5
450	Iran	IRANIAN (Persian) gr, pul, wh, scd 2/	1,600	13.82	1.75	-:	.9:	6.5:	13.4:	17.7:	15.7:	11.4:	7.3:	7.8:	3.9:	5.1:	3.2:	2.8:	1.0:	.7:	.9:	.3:	.4:	.5:	.6
461	Iran	IRANIAN (Persian) gr, pul, wh, scd 2/	1,600	7.75	1.44	-:	1.6:	13.3:	20.6:	17.1:	11.6:	8.4:	7.1:	5.3:	4.8:	3.0:	2.6:	1.7:	-:	.7:	.3:	.3:	.2:	.1:	.1
471	Iran	IRANIAN (Persian) gr, pul, off-wh, scd 2/	1,600	13.62	1.25	-:	.6:	6.3:	15.3:	16.7:	16.1:	10.1:	8.4:	6.7:	4.7:	4.5:	3.0:	2.8:	1.3:	1.0:	.6:	.5:	.6:	.2:	.6
170	India	JORIA (E Indian) gr, shn, wh, scd 2/	1,600	43.56	9.81	-:	.5:	2.9:	10.5:	15.4:	16.9:	12.7:	10.3:	7.6:	7.5:	6.1:	3.3:	3.1:	1.8:	.8:	.2:	.1:	.1:	.1:	.1
240	India	VICANERE (E Indian) gr, shn, wh	1,600	40.88	5.25	-:	.7:	7.1:	16.3:	18.8:	13.8:	12.3:	7.4:	6.2:	5.6:	3.0:	3.1:	2.6:	.9:	1.1:	.3:	.4:	.1:	.2:	.1
402	India	BICANERE (E Indian) gr, shn, sup wh, scd 2/	1,600	34.32	4.69	-:	2.1:	9.6:	18.6:	18.5:	13.9:	10.9:	18.2:	6.4:	4.7:	3.1:	1.8:	1.4:	.4:	.1:	.1:	.1:	-:	.1:	.1
410	India	BICANERE (E Indian) gr, shn, wh, scd 2/	1,600	40.00	3.38	-:	1.2:	8.1:	16.1:	18.1:	14.9:	11.1:	8.2:	8.2:	5.1:	3.9:	1.9:	1.9:	.9:	.1:	.1:	.1:	-:	-:	.1
460	India	BICANERE (E Indian) gr, shn, wh, scd 2/	1,600	37.75	3.18	-:	1.0:	9.4:	17.6:	20.0:	14.3:	11.0:	7.9:	6.6:	4.3:	2.9:	1.7:	1.2:	.6:	.6:	.2:	.4:	.1:	.1:	-
200	India	E INDIAN gr, shn, wh, scd 2/	1,600	11.31	8.00	-:	3.6:	17.9:	20.5:	17.6:	10.5:	7.4:	5.6:	4.7:	3.1:	2.3:	1.8:	1.7:	.9:	.7:	1.1:	.4:	.1:	-:	.1
401	Pak.	MONTGOMERY (E Indian) sup wh, scd, pul	1,600	20.12	6.88	-:	3.6:	17.8:	21.4:	16.3:	11.1:	8.9:	5.5:	4.3:	3.3:	2.5:	1.9:	1.7:	.4:	.4:	.4:	.3:	.1:	-:	.1
252	Pak.	MONTGOMERY (E Indian) gr, shn, pale yel	1,600	21.25	5.32	-:	2.4:	17.3:	22.1:	15.4:	12.1:	8.0:	7.1:	4.6:	3.2:	2.9:	2.1:	1.3:	.6:	.4:	.3:	.1:	.1:	-:	-
452	Pak.	MONTGOMERY (E Indian) gr, shn, yel, scd 2/	1,600	36.06	7.12	-:	.9:	6.5:	15.9:	17.3:	12.8:	11.6:	8.6:	6.7:	5.1:	3.1:	3.6:	2.9:	1.2:	1.6:	1.0:	.6:	.3:	.2:	.1
490	Pak.	MONTGOMERY (E Indian) scd, pul, vel	1,600	30.75	3.56	-:	.7:	5.8:	16.1:	19.1:	15.6:	11.2:	9.0:	6.1:	4.3:	3.3:	2.0:	2.7:	1.0:	1.1:	.6:	.4:	.3:	.2:	.5
492	Pak.	E INDIAN gr, shn, yel, scd 2/	1,600	34.82	5.25	-:	1.0:	8.6:	15.4:	17.3:	13.1:	9.7:	9.0:	6.6:	4.1:	3.9:	3.4:	2.6:	1.5:	1.4:	.7:	.6:	.4:	.3:	.4
201	Pak.	PAKISTAN (E Indian), gr, shn, scd, 2/ wh	1,600	10.75	2.31	-:	6.6:	23.4:	24.6:	14.2:	9.9:	6.3:	4.0:	3.4:	1.8:	2.0:	1.2:	.9:	.5:	.6:	.1:	-:	.1:	.3:	.1
180	Pak.	KHORRASSAN (E Indian) gr, shn, sup, wh, scd 2/	1,600	16.62	7.06	-:	3.9:	16.3:	23.7:	16.5:	9.7:	7.5:	5.1:	4.7:	3.2:	2.9:	1.6:	1.9:	.9:	1.1:	.2:	.2:	.1:	.4:	.1
430	Pak.	KHORRASSAN (E Indian) gr, shn, wh, scd 2/	1,600	17.94	4.12	-:	5.6:	19.5:	21.7:	15.8:	9.5:	8.7:	5.3:	4.3:	1.9:	1.7:	2.2:	1.2:	.9:	.8:	.3:	.3:	.1:	.1:	.1
421	Afgn.	KANDAHAR (E Indian) gr, shn, wh, scd 2/	1,600	8.19	.75	0.1:	9.4:	23.0:	19.0:	14.7:	9.3:	6.5:	5.2:	4.3:	2.3:	2.4:	1.0:	.7:	.5:	.3:	.4:	.3:	.1:	.1:	.1
411	Pak.	KANDAHAR (E Indian) gr, shn, sup wh, scd 2/	1,600	12.88	4.50	-:	3.2:	17.1:	23.3:	17.8:	12.1:	7.6:	5.1:	3.6:	2.8:	2.3:	1.5:	1.7:	.7:	.4:	.2:	.1:	.3:	.1:	.1
183	O.Mon	MONGOLIAN wsh, pul, wh, scd 2/	1,600	2.87	6.00	-:	16.4:	30.8:	22.7:	11.6:	6.2:	2.2:	1.1:	1.1:	.7:	.9:	1.2:	1.1:	.9:	1.0:	.9:	.6:	.3:	.1:	.4
440	O.Mon	MONGOLIAN gr, shn, wh, scd 2/	1,600	2.44	7.87	-:	15.1:	32.8:	22.9:	10.3:	4.4:	2.5:	.7:	.7:	.5:	1.1:	1.3:	1.7:	1.2:	1.6:	1.0:	.9:	.7:	.3:	.2
462	USSR	MONGOLIAN shn, wsh, wh, scd 2/	1,600	3.19	6.62	.7:	18.7:	31.1:	19.9:	11.4:	5.6:	2.2:	1.2:	.9:	1.7:	1.2:	.8:	.8:	1.1:	.7:	1.0:	.6:	.2:	.1:	.1
272	Ire.	BLACKFACE gr, shn, mach	1,600	18.12	4.37	-:	3.3:	14.5:	20.5:	18.0:	12.7:	8.7:	5.2:	4.7:	3.7:	1.7:	1.9:	2.0:	.7:	.8:	.5:	.4:	.2:	.1:	.3
291	U S Af	KARAKUL shn, scd, lt gry	1,600	7.75	.18	-:	5.6:	19.1:	21.9:	15.6:	7.9:	6.3:	5.7:	6.2:	3.3:	3.0:	2.0:	1.4:	.7:	.2:	.6:	.3:	.1:	-:	.1
380	U S Af	KARAKUL gr, shn, lt gry	1,600	7.94	1.32	-:	5.6:	20.5:	21.6:	13.3:	7.4:	6.2:	6.9:	6.5:	4.4:	3.2:	1.4:	1.5:	.8:	.2:	.1:	.11	.1:	.13	.1
281	Yugo.	ZACKEL gr, pul, lt gry	1,600	9.37	1.06	-:	.7:	5.7:	13.0:	14.2:	13.7:	13.8:	9.0:	8.3:	5.6:	5.0:	3.8:	3.0:	1.4:	1.3:	.6:	.4:	.2:	.2:	.1

See footnotes at end of table.

Table 2.—**Results of micron analysis of 146 samples** of wool: Laboratory A--Continued

Sample No.	Origin	Description and customs (visual) classification 1/	Total fibers counted	Percent medulated fibers	Percent kemp fibers	Percentage of fibers in each micron cell																			
						5.00 to 9.99	10.00 to 14.99	15.00 to 19.99	20.00 to 24.99	25.00 to 29.99	30.00 to 34.99	35.00 to 39.99	40.00 to 44.99	45.00 to 49.99	50.00 to 54.99	55.00 to 59.99	60.00 to 64.99	65.00 to 69.99	70.00 to 74.99	75.00 to 79.99	80.00 to 84.99	85.00 to 89.99	90.00 to 94.99	95.00 to 99.99	100.00 and over
		UNIMPROVED—Continued																							
		Mixtures of named and improved																							
123	Arg.	CORDOVA and nf/40s shn, scd	1,600	7.31	0.18	-	0.9	12.4	21.3	19.8	14.3	10.6	8.6	5.1	2.7	2.0	1.0	0.3	0.1	0.3	-	0.3	0.1	0.1	0.1
355	Arg.	CORDOVA and nf/40s gr, shn	1,600	5.12	.88	-	1.9	10.2	19.7	22.0	15.5	12.4	7.3	5.8	1.9	1.3	.9	.6	.2	.1	0.1	-	.1	-	-
481	Arg.	CORDOVA and nf/40s gr, shn	1,600	7.06	.38	-	.9	11.9	22.2	21.2	15.2	11.1	7.4	3.8	2.9	1.4	1.0	.7	.1	.1	-	-	-	.1	-
150	Scot.	SCOTCH BLACKFACE and nf/40s gr, fles	1,600	35.81	1.82	-	1.1	6.7	13.4	15.5	16.0	14.7	11.4	9.1	4.6	2.9	1.9	1.0	.6	.6	.2	.1	.1	.1	-
120	Italy	SARDINIAN and nf/40s gr, pul	1,600	11.38	5.38	-	5.1	17.5	18.8	16.9	10.3	7.4	4.1	4.1	2.4	2.6	2.1	2.1	1.4	1.1	.9	1.0	.5	.8	.9
		Carpet blends																							
160	U.K.	LONDONSHIRE scd, shn, pul, wh	1,600	13.94	2.00	-	4.7	13.0	15.4	15.4	10.9	11.3	9.6	7.3	4.2	2.7	1.3	1.4	.9	.8	.6	-	-	.2	.3
420	U.K.	ENGLISH gr, shn, wh	1,600	20.68	5.19	-	2.0	11.5	18.8	18.3	13.4	12.4	8.5	4.8	3.7	2.2	1.5	.9	.6	.7	.3	.3	.1	-	-
442	U.K.	WELSH gr, pul	1,600	14.82	1.88	-	1.3	8.6	17.3	21.6	17.2	12.6	7.8	4.8	3.9	1.4	.8	1.2	.4	.2	.4	.2	.2	.1	-
441	U.K.	ENGLISH CROSSBRED 3/ gr, shn	1,600	34.69	2.94	-	.8	3.8	8.2	11.6	12.7	14.6	15.1	11.4	8.0	4.8	2.8	2.2	1.3	.9	1.1	.3	.1	.3	-
232	Neth.	HOLLAND scd, shn, wh	1,600	7.00	2.88	-	6.2	15.6	17.6	19.6	13.3	8.9	6.1	3.8	2.3	1.4	1.3	1.0	.5	.5	.5	.4	.3	.3	.4
242	Neth.	HOLLAND scd, shn, wh	1,600	10.62	2.25	-	7.6	16.1	17.3	18.8	12.7	10.6	6.2	4.3	1.4	1.5	.8	.7	.5	.5	.2	.3	.2	.1	.2
412	Neth.	HOLLAND scd, shn, pul, wh	1,600	9.25	2.25	0.6	8.7	14.4	19.5	17.4	10.6	10.1	6.0	3.9	1.6	1.5	1.3	.9	.6	1.1	.3	.4	.3	.3	.5
422	Neth.	HOLLAND scd, shn, pul, wh	1,600	8.82	2.82	-	4.5	12.7	18.5	19.0	13.6	9.9	7.7	4.8	2.3	1.1	1.2	1.2	.7	.6	.8	.7	.1	.3	.3
		IMPROVED																							
		Not finer than 40s																							
331	N.Z.	FELT flcs, fe	1,600	6.75	-	-	.3	1.8	6.9	10.7	15.8	21.9	20.1	13.9	5.3	2.2	.5	.5	.1	-	-	-	-	-	-
351	N.Z.	FELT flcs, fe	1,600	4.19	-	-	.2	2.0	6.2	12.1	15.7	22.8	18.6	13.7	5.7	2.2	.7	.1	-	-	-	-	-	-	-
371	N.Z.	FELT flcs, fe	1,600	4.00	-	-	.2	1.5	6.3	10.2	17.4	22.8	20.2	13.8	4.2	2.6	.6	.1	-	-	.1	-	-	-	-
261	N.Z.	SOFT COTTED flcs, fe	1,600	5.88	-	-	.3	3.5	10.8	17.2	20.8	19.9	14.9	7.0	3.9	1.1	.4	.2	-	-	-	-	-	-	-
105	N.Z.	"B" style flcs, fe	1,600	8.50	-	-	.3	2.8	9.3	15.7	19.5	19.7	16.5	9.8	3.6	2.0	.7	.1	-	-	-	-	-	-	-
340	N.Z.	"B" style es, flcs	1,600	6.62	.06	-	.2	1.1	7.4	13.7	18.5	19.1	18.9	12.5	4.7	2.7	.6	.3	.2	-	-	-	-	-	.1
330	N.Z.	EARLY SHORN flcs	1,600	2.44	-	-	.3	1.7	6.9	12.8	17.8	22.6	20.1	11.4	3.4	1.9	.8	.3	-	-	-	-	-	-	-
115	N.Z.	2D SHEAR gr, shn	1,600	7.75	.06	-	.3	2.3	9.6	15.0	19.1	19.2	16.1	9.7	5.4	1.8	.8	.4	-	-	.1	-	.1	-	.1
335	N.Z.	2D SHEAR gr, shn	1,600	7.88	-	-	.4	4.6	13.9	16.5	20.5	17.6	13.4	8.1	3.8	.8	.4	-	-	-	-	-	-	-	-
135	N.Z.	PULLED gr, fe	1,600	7.06	-	-	.1	1.6	7.7	14.6	18.1	20.1	18.3	11.3	5.0	2.3	.8	.1	-	-	-	-	-	-	-
101	N.Z.	CRUTCHINGS gr, shn	1,600	17.25	.31	-	.1	2.5	7.9	14.7	16.4	16.4	17.7	13.0	6.0	3.3	.9	.4	.1	.3	.2	-	-	-	.1
145	N.Z.	CRUTCHINGS gr, shn	1,600	18.25	.12	-	.3	2.8	9.2	14.4	17.5	18.7	16.6	9.5	6.1	2.6	1.6	.3	.1	.1	.1	.1	-	-	-
162	N.Z.	CRUTCHINGS gr, shn	1,600	14.94	.12	-	.3	1.7	7.1	14.0	15.7	19.2	16.5	11.9	7.7	3.8	1.3	.6	.1	.1	-	-	-	-	-
165	N.Z.	CRUTCHINGS gr, shn	1,600	14.12	.06	-	.1	1.3	6.1	14.5	20.6	23.8	16.7	9.8	4.6	1.9	.4	.1	-	.1	-	-	-	-	-
185	N.Z.	CRUTCHINGS gr, shn	1,600	18.87	.12	-	.2	3.7	10.1	11.9	16.6	17.1	16.8	12.8	5.9	3.2	1.2	.2	.1	.1	.1	-	-	-	-
195	N.Z.	CRUTCHINGS gr, shn	1,600	16.50	-	-	.2	1.8	8.3	13.9	19.4	21.3	17.2	10.0	4.6	2.0	.8	.4	-	.1	-	-	-	-	-
320	N.Z.	CRUTCHINGS gr, shn	1,600	18.56	.12	-	.2	3.4	11.9	15.9	15.7	17.7	17.7	13.1	9.0	6.8	4.1	1.4	.4	.2	.1	-	-	.1	-
103	Arg.	BA 5/6s Nov, scd, shn	1,600	6.62	-	-	.3	3.1	9.9	13.9	17.2	18.0	16.5	10.6	5.4	3.1	1.3	.4	.1	.1	.1	-	-	-	-
182	Arg.	BA 5/6s Nov, gr, shn	1,600	5.69	-	-	.4	3.9	10.5	14.1	18.1	21.6	15.4	9.2	4.3	1.2	1.0	.1	.1	-	-	-	-	-	-
202	Arg.	BA 5/6s Nov, scd, shn	1,600	9.50	.12	-	.6	4.3	11.3	16.3	18.3	18.8	15.4	8.8	3.3	1.9	.7	.3	-	-	-	-	-	-	-
212	Arg.	BA 5/6s Mar, gr, shn	1,600	8.00	-	-	.3	3.0	10.9	15.8	15.8	20.4	16.4	9.8	4.8	1.6	.7	.3	-	.1	.1	-	-	-	-
222	Arg.	BA 5/6s Mar, scd, shn	1,600	6.38	-	-	.6	3.5	10.0	13.9	16.9	20.8	16.3	10.1	4.8	1.6	1.0	.4	.1	-	-	-	-	-	-
491	Arg.	BA 5/6s Nov, gr, shn, long	1,600	5.56	-	-	.4	3.9	10.3	14.4	17.3	22.1	15.6	8.6	4.6	1.4	.7	.5	-	.1	-	-	-	.1	-
231	Arg.	BA 5/6s pul, wsh	1,600	7.12	-	-	.3	3.6	11.0	15.3	18.3	19.0	15.8	10.1	3.4	1.8	1.0	.3	-	-	.1	-	-	-	-
370	Arg.	BA 5/6s gr, pul, fe	1,600	4.32	.18	-	.1	4.3	11.1	14.3	18.7	18.3	15.7	10.8	3.6	2.4	.5	.1	-	.1	-	-	-	-	-
400	Arg.	BA 5/6s gr, pul	1,600	6.50	-	-	.3	4.2	10.9	16.9	19.4	20.1	14.6	7.8	2.7	1.4	.8	.6	.1	.1	.1	-	-	-	-
172	Arg.	BA 5/6s gr, pul, 3/4 in	1,600	6.19	-	-	.3	3.4	11.9	17.4	20.4	19.8	14.1	6.6	3.4	2.0	.4	.2	-	.1	-	-	-	-	-
470	Arg.	BA 5/6s gr, pul, 3/4 in	1,600	5.94	-	-	.6	4.9	12.3	13.5	19.2	19.3	16.6	8.1	3.4	1.4	.5	.1	.1	-	-	-	-	-	-
192	Arg.	BA 5/6s shn, scd	1,600	6.32	.06	-	.6	5.8	13.4	17.6	17.4	17.0	14.1	7.7	2.9	.6	.6	.1	-	-	-	-	-	-	-
350	Arg.	BA 5/6s shn, scd, ce	1,600	3.26	-	-	.3	3.6	10.1	15.4	18.0	21.1	15.6	9.1	3.2	1.8	.9	.6	.1	.1	.1	-	-	-	-
360	Arg.	BA 5/6s gr, shn, sup lb	1,600	18.69	.56	-	.7	8.4	17.8	22.6	17.3	14.4	8.5	5.6	2.7	1.0	.4	.2	.1	.1	.1	-	.1	-	-
113	Arg.	BA 5/6s scd, bur, shn	1,600	7.94	-	-	.3	5.1	11.5	17.5	22.7	19.4	12.4	6.1	3.0	1.4	.3	.3	-	-	-	-	-	-	-
305	W.Ger.	flcs	1,600	17.96	.19	-	.4	4.9	9.4	14.6	18.9	18.2	12.8	10.1	5.2	2.9	1.6	.7	.1	.1	-	-	-	-	-
310	W.Ger.	flcs	1,600	21.38	.38	-	1.0	4.6	9.2	15.2	17.2	17.4	14.5	10.7	4.9	3.1	1.2	.6	.3	.1	-	-	-	-	.1
432	W.Ger.	Eider flcs, fe	1,600	22.81	-	-	.4	4.1	8.5	14.6	18.9	18.7	13.8	10.3	5.4	2.5	1.6	.8	.3	-	-	-	-	-	-
315	Ire.	Wethers flcs, fe	1,600	20.56	.25	-	.5	1.7	6.7	12.4	18.7	21.-	18.3	11.0	5.0	2.7	1.2	.4	.3	-	-	.1	-	-	-
223	Ire.	Wethers felt flcs, fe, slt	1,600	24.62	.19	-	.1	2.6	7.2	12.8	18.7	20.0	17.8	10.3	6.2	2.3	.9	.6	.2	.1	.1	-	-	-	-
4/ 280	Ire.	Crossbred gr, shn	1,600	26.06	-	-	.1	1.1	4.0	11.4	16.9	20.2	18.1	15.0	7.4	3.7	1.4	.6	.1	-	-	-	.1	-	-
472	Ire.	Crossbred flcs, fe	1,600	32.81	.75	-	.7	5.0	10.4	15.3	16.1	17.9	13.8	10.2	5.8	2.7	1.6	.3	.1	.1	-	-	-	-	-
220	U.K.	DEVON sc	1,600	49.31	2.94	-	.4	3.4	9.7	14.2	15.8	16.4	14.4	12.7	5.6	4.3	1.5	1.1	.1	.2	-	.1	-	-	-
262	U.K.	DEVON flcs	1,600	31.50	.62	-	-	.8	4.1	8.1	11.3	17.9	18.7	17.1	10.6	5.4	3.3	1.1	.7	.6	.2	-	.1	-	-
312	Uru.	cb flcs, low mixed quality	1,600	4.69	-	-	.2	1.9	7.7	14.4	16.2	23.1	19.6	9.5	4.3	2.4	.5	.1	.1	-	-	-	-	-	-
322	Uru.	cb flcs, low mixed quality	1,600	4.31	-	-	.2	3.9	11.2	17.3	24.6	20.8	13.8	6.1	1.6	.2	.2	.1	-	-	-	-	-	-	-

See footnotes at end of table.

Table 2.—**Results of micron analysis of 146 samples** of wool: Laboratory A--Continued

Sample No.	Origin	Description and customs (visual) classification 1/	Total fibers counted	Percent medulated fibers	Percent kemp fibers	Percentage of fibers in each micron cell																				
						5.00 to 9.99	10.00 to 14.99	15.00 to 19.99	20.00 to 24.99	25.00 to 29.99	30.00 to 34.99	35.00 to 39.99	40.00 to 44.99	45.00 to 49.99	50.00 to 54.99	55.00 to 59.99	60.00 to 64.99	65.00 to 69.99	70.00 to 74.99	75.00 to 79.99	80.00 to 84.99	85.00 to 89.99	90.00 to 94.99	95.00 to 99.99	100.00 and over
		IMPROVED--Continued																								
		Finer than 40s, not finer than 44s																								
301	N.Z.	FELT flcs, ce	1,600	4.94	-	-	0.1	1.1	6.3	13.2	18.0	24.4	18.6	12.3	3.6	1.8	0.5	0.1	-	-	-	-	-	-	-	-
341	N.Z.	FELT flcs, ce	1,600	6.37	-	-	.1	1.9	6.9	11.9	18.3	23.3	18.0	11.3	4.7	2.1	.8	.2	-	-	0.1	-	-	-	-	-
345	N.Z.	FELT flcs, ce	1,600	3.81	-	-	-	1.6	5.0	13.4	17.2	22.5	21.3	12.0	4.5	1.8	.7	-	-	-	-	-	-	-	-	-
361	N.Z.	FELT flcs, ce	1,600	4.75	-	-	.2	1.8	8.1	13.7	18.2	20.9	17.2	11.6	4.9	2.4	.7	.3	-	-	-	-	-	-	-	-
321	N.Z.	FELT flcs, ce	1,600	5.19	-	-	.4	1.9	7.6	13.3	18.3	21.1	18.6	11.4	4.6	2.4	.2	.2	-	-	-	-	-	-	-	-
213	N.Z.	FELT gr, pul, fe	1,600	6.81	-	-	.1	1.6	7.6	14.7	17.9	21.1	18.1	11.1	5.0	2.2	.5	.1	0.1	-	-	-	-	-	-	-
253	N.Z.	"B" flcs, fe	1,600	5.82	0.06	-	.3	2.7	8.8	12.2	20.3	22.4	16.7	9.1	2.1	.2	.1	-	-	-	-	-	-	-	-	-
190	N.Z.	"B" flcs, ce	1,600	4.12	-	-	.9	5.4	12.1	17.3	20.4	19.7	13.5	6.6	3.2	.7	.1	-	.1	-	-	-	-	-	-	-
325	N.Z.	EARLY SHORN flcs	1,600	9.81	.12	-	.1	1.7	7.8	13.5	17.1	19.2	17.2	12.1	6.3	3.1	1.1	.2	-	0.1	-	-	-	-	-	-
161	N.Z.	2d SHEAR gr, shn	1,600	9.62	-	-	-	.9	6.9	12.3	18.8	21.3	17.5	11.8	6.4	2.8	.8	.5	-	-	-	-	-	-	-	-
102	N.Z.	CRUTCHINGS gr, shn	1,600	15.44	-	-	.1	2.6	8.4	11.1	16.1	19.1	18.1	11.8	7.0	3.3	1.9	.3	-	.1	-	0.1	-	-	-	-
112	N.Z.	CRUTCHINGS gr, shn	1,600	17.50	-	-	.1	1.3	6.8	12.1	16.5	18.0	17.4	13.1	7.9	4.3	1.8	.6	.1	-	-	-	-	-	-	-
191	N.Z.	CRUTCHINGS gr, shn	1,600	14.38	.06	-	.1	.9	7.6	11.9	14.6	16.9	18.0	14.3	8.1	5.3	1.6	.6	-	-	-	-	-	-	-	-
121	N.Z.	CRUTCHINGS blend, gr, shn	1,600	13.88	-	-	.4	4.0	10.3	15.7	18.3	18.9	14.7	9.7	4.2	2.1	1.4	.2	-	.1	-	-	-	-	0.1	-
131	N.Z.	CRUTCHINGS blend, gr, shn	1,600	12.25	-	-	.3	2.4	11.6	18.3	18.9	17.6	14.1	10.0	3.1	2.1	.7	.6	-	.1	.1	-	-	-	.1	-
141	N.Z.	CRUTCHINGS blend, gr, shn	1,600	12.38	.12	-	.2	3.3	12.5	18.7	18.3	17.1	12.5	8.1	5.7	1.5	1.2	.5	.1	.1	-	-	-	-	.1	-
271	N.Z.	DAG scd, shn	1,600	10.69	-	-	.3	3.3	12.9	19.1	19.8	18.2	11.9	7.8	3.8	1.9	.6	.2	-	-	.1	.1	-	-	-	-
203	Ire.	FELT wethers, flcs, sup, slt, ce	1,600	27.31	.31	-	.5	1.6	6.2	14.8	18.3	18.3	17.7	10.9	6.3	3.2	1.3	.7	-	.1	.1	-	-	-	-	-
292	Ire.	FELT wethers, flcs, sup, slt, fe	1,600	28.00	.25	-	.6	3.1	8.4	13.4	19.5	20.7	14.1	10.7	4.9	2.6	1.1	.6	.2	.1	-	-	-	-	-	-
233	Austl.	"B" flcs	1,600	7.38	-	-	.3	2.1	7.9	13.4	19.5	20.7	14.1	10.7	4.9	2.6	1.1	.6	.2	.1	-	-	-	-	-	-
365	Uru.	MONTE CRIOLLA gr, shn	1,600	19.37	.25	-	1.2	6.9	16.9	20.6	19.1	14.9	9.4	5.3	2.2	2.1	.7	.2	.2	.1	.1	-	-	-	-	-
		Finer than 44s, not finer than 46s																								
302	N.Z.	FELT gr, pul	1,600	14.19	-	-	.9	5.5	15.1	17.9	19.2	17.3	13.6	6.4	3.1	.5	.4	.1	-	-	-	-	-	-	-	-
311	N.Z.	FELT gr, pul	1,600	13.62	-	-	.2	4.6	14.3	20.7	20.7	18.1	12.7	5.6	1.7	.9	.4	.1	-	-	-	-	-	-	-	-
381	N.Z.	FELT gr, pul	1,600	11.56	-	-	.7	5.9	14.9	19.9	19.9	15.0	12.1	7.5	2.9	1.1	.4	-	-	-	-	-	-	-	-	-
391	N.Z.	FELT gr, pul	1,600	15.94	-	-	.3	4.6	12.7	20.9	21.8	17.4	12.6	6.7	1.9	.9	.1	.1	-	-	-	-	-	-	-	-
142	N.Z.	"B" flcs, fe	1,600	5.19	-	-	.3	2.3	8.8	14.2	21.0	19.5	16.7	10.5	4.4	1.4	.5	.3	.1	-	-	-	-	-	-	-
243	N.Z.	"C" flcs, ce	1,600	6.12	-	-	.8	4.3	9.4	17.1	18.6	18.9	16.4	9.1	3.4	1.6	.1	.3	-	-	-	-	-	-	-	-
171	N.Z.	2d SHEAR gr, shn	1,600	8.75	-	-	-	2.8	9.5	16.4	20.9	18.5	15.1	9.2	4.8	2.2	.4	.2	-	-	-	-	-	-	-	-
152	N.Z.	CRUTCHINGS gr, shn	1,600	15.32	.12	-	.2	1.1	7.0	14.4	22.0	21.7	17.4	9.6	3.6	1.9	.7	.3	-	-	-	-	-	0.1	-	-
		Finer than 46s																								
181	N.Z.	"B" flcs	1,600	5.25	-	-	.6	5.0	11.4	17.3	21.2	20.8	11.8	6.5	4.1	.5	.5	.3	-	-	-	-	-	-	-	-
122	N.Z.	2d SHEAR gr, shn	1,600	6.06	-	-	.2	3.9	13.1	18.7	20.5	18.0	12.6	7.5	3.8	1.3	.4	-	-	-	-	-	-	-	-	-
132	N.Z.	2d SHEAR gr, shn	1,600	6.50	-	-	.2	4.0	11.6	17.8	20.2	17.7	15.3	8.9	2.8	1.1	.3	.1	-	-	-	-	-	-	-	-
151	N.Z.	2d SHEAR gr, shn	1,600	7.50	-	-	.2	4.9	13.5	20.3	20.2	17.9	13.0	6.0	2.8	.8	.3	.1	-	-	-	-	-	-	-	-
		Composite grades (bales mixed)																								
111	N.Z.	44s-46s 2d sh, gr, shn	1,600	7.13	-	-	.1	1.3	6.1	15.1	20.7	20.6	17.8	9.9	4.9	2.6	.8	.1	-	-	-	-	-	-	-	-
125	N.Z.	nf/40s-44s-46s gr, pul	1,600	7.06	-	-	.1	1.5	6.8	14.2	17.5	19.7	18.4	12.2	6.2	2.2	1.0	.2	-	-	-	-	-	-	-	-
155	N.Z.	nf/40s-44s-46s 2d sh, gr, shn	1,600	8.82	-	-	.3	3.3	9.9	17.9	18.5	19.8	16.0	7.9	4.2	1.5	.6	-	.1	-	-	-	-	-	-	-
175	N.Z.	nf/40s-44s-46s 2d sh, gr, shn	1,600	8.06	-	-	.1	2.3	10.4	17.2	19.8	22.2	14.2	8.4	3.4	1.4	.4	.2	-	-	-	-	-	-	-	-

1/ Designations: bur, burry; cb, combing; ce, toward coarse edge of customs grade; clp, clipped; clr, colored; es, early shorn; fe, toward fine edge of customs grade; felt, papermakers' felt type; flcs, fleeces; fn, fawn; gr, greasy; gry, gray; in, inches in length of fiber; kpy, kempy; lb, lambs (wool); lt, light; mach, machined; Mar, shorn in March; md, moth damage; nf/40s, not finer than 40s; Nov, shorn in November; pcs, pieces; pul, pulled; scd, scoured; 2d sh, second shear; shn, shorn; slt, selected; srt, sorted; sup, super; wh, white; wsh, washed; yel, yellow; 44s, finer than 40s and not finer than 44s; 46s, finer than 44s and not finer than 46s.

2/ Washed with water after shearing or pulling and consequently considered scoured by customs.

3/ Complaint filed by buyer that this lot was merely a mixed lot and not the standard English blend.

4/ Sample No. 280 was originally classified as an Irish Blackface by mistake; the wool was reexamined and regraded after it was discovered that this classification was out of line with its micron grade and with the hand sample that was taken.

Table 3.—**Results of micron analysis of 146 samples** of wool: Laboratory B

Sample No.	Origin	Description and customs (visual) classification 1/	Total fibers counted	Percent medullated fibers	Percent kemp fibers	Percentage of fibers in each micron cell																				
						5.00 to 9.99	10.00 to 14.99	15.00 to 19.99	20.00 to 24.99	25.00 to 29.99	30.00 to 34.99	35.00 to 39.99	40.00 to 44.99	45.00 to 49.99	50.00 to 54.99	55.00 to 59.99	60.00 to 64.99	65.00 to 69.99	70.00 to 74.99	75.00 to 79.99	80.00 to 84.99	85.00 to 89.99	90.00 to 94.99	95.00 to 99.99	100.00 and over
		UNIMPROVED																								
		Named and similar																								
241	Arg.	CORDOVA gr, shn	1,200	14.25	1.67	-	2.4	12.3	20.7	18.8	15.2	8.7	6.9	4.9	3.8	1.9	1.6	0.9	0.4	0.5	0.7	0.1	0.1	0.1	-
130	Scot.	SCOTCH BLACKFACE slt, flcs	1,200	32.58	7.75	-	1.6	11.6	19.2	18.0	14.6	12.9	6.0	6.2	3.8	2.1	1.6	1.6	.5	.1	.1	.1	-	-	-
140	Scot.	SCOTCH BLACKFACE srt, wh	1,200	30.92	8.17	0.1	2.8	10.3	17.2	21.0	13.6	9.8	6.8	3.9	3.8	2.4	2.2	2.0	.8	.5	.7	.1	.3	.5	1.2
250	Scot.	SCOTCH BLACKFACE gr, shn, mach	1,200	40.92	9.50	-	2.3	9.9	15.7	16.4	15.0	10.2	5.7	5.1	4.9	3.4	2.5	2.5	1.0	.6	1.7	-	.8	.4	1.9
451	Scot.	SCOTCH BLACKFACE slt, flcs	1,200	35.58	10.75	-	2.6	7.4	12.2	18.5	19.1	10.5	7.1	5.4	3.2	3.2	2.2	2.5	1.0	1.0	1.3	.2	.6	.3	1.7
375	Scot.	HASLOCK wh, gr, pul	1,600	30.57	8.76	-	.9	9.2	16.9	16.8	14.1	14.0	12.3	7.0	4.0	2.5	1.2	1.0	.1	-	-	-	-	-	-
163	Eng.	WELSH MOUNTAIN flcs	1,200	11.25	2.34	-	2.8	12.8	21.7	20.5	15.5	12.2	6.2	3.3	2.1	1.1	.3	.3	.4	.2	.3	-	.1	.1	.1
173	Eng.	WELSH MOUNTAIN wh, gr, pul	1,200	16.92	1.66	-	1.5	9.1	16.8	24.4	18.4	11.4	7.8	4.8	1.9	1.6	.8	.4	.4	-	.3	.2	.1	-	.1
482	Ire.	WELSH MOUNTAIN scd, kpy, flcs	1,200	10.25	3.00	-	1.7	10.3	19.9	25.5	17.3	10.1	6.7	1.8	1.4	1.4	1.0	1.2	.4	.1	.3	.2	.3	.1	.3
133	Malta	CYPRUS wh, flcs	1,200	16.92	3.75	-	4.5	20.3	20.9	14.7	9.9	7.1	6.0	5.4	3.8	3.1	2.3	1.0	.5	.3	.1	.1	-	-	-
143	Malta	CYPRUS wh, flcs	1,200	13.75	4.33	-	3.7	15.2	23.3	17.2	10.0	8.5	6.0	4.7	3.5	1.8	1.0	.7	1.1	1.2	.8	.3	.2	.1	.7
153	Malta	CYPRUS wh, flcs	1,200	11.92	3.25	-	2.3	12.8	26.1	22.2	9.7	5.8	4.2	4.3	4.0	3.1	2.0	1.5	.5	.3	.5	.2	.1	.1	.3
100	Italy	SARDINIAN lb, shn, scd	1,200	21.59	5.17	-	3.5	18.2	18.5	14.8	9.7	6.8	6.6	6.1	6.4	3.5	3.1	1.6	.8	.1	.3	-	-	-	-
110	Italy	SARDINIAN shn, scd	1,200	11.00	3.92	-	8.2	20.3	20.0	14.4	8.7	6.0	4.0	2.9	3.5	3.3	2.9	2.1	1.0	.4	.7	.3	.2	.5	.6
211	Syria	ALEPPO flcs, scd 2/	1,200	7.33	1.09	-	3.4	15.9	22.1	19.6	12.8	6.5	4.8	3.1	4.3	3.7	2.1	.8	.4	.2	.3	-	-	-	-
221	Syria	ALEPPO gr, scd 2/	1,200	6.08	2.08	-	2.4	13.5	20.0	18.6	14.3	9.1	6.3	3.8	4.1	3.4	1.5	1.2	.1	.8	.2	.2	.2	-	.3
385	Syria	ALEPPO gr, pul, wh, scd 2/	1,600	9.69	4.07	-	1.6	11.5	23.1	20.1	10.1	8.8	7.7	5.5	3.0	2.8	2.3	2.7	.6	.1	-	.1	-	-	-
390	Syria	ALEPPO gr, pul, wh, scd 2/	1,600	8.57	2.63	-	1.9	15.8	21.5	17.6	10.9	9.4	7.9	6.4	3.3	2.4	1.4	1.0	.3	.1	.1	-	-	-	-
395	Syria	ALEPPO gr, pul, wh, scd 2/	1,600	10.07	2.63	-	3.2	16.3	20.2	17.8	10.9	8.3	6.8	4.8	3.2	2.9	2.7	2.1	.5	.2	.1	-	-	-	-
480	Syria	ALEPPO flcs, lst wh, scd 2/	1,200	9.42	2.42	-	3.0	15.9	22.8	18.0	11.3	7.7	5.4	4.2	3.5	2.0	1.4	1.8	.8	.6	.8	.1	.4	.2	.1
260	Iraq	AWASSI (Bagdad) wh, flcs, scd 2/	1,200	6.92	3.33	-	1.9	11.1	18.1	21.5	12.0	9.1	5.7	5.4	5.4	3.3	1.7	1.6	1.0	.6	.7	.1	.3	.1	.4
210	Iraq	AWASSI (Bagdad) wh, flcs, scd 2/	1,200	6.00	.42	-	2.3	16.6	22.1	16.6	12.8	8.4	7.5	4.4	3.7	2.5	1.3	1.1	.2	.4	.1	-	-	-	-
270	Iraq	AWASSI (Bagdad) gr, pcs, fn, scd 2/	1,200	7.84	1.34	-	5.8	22.0	24.4	17.8	8.8	6.1	5.2	3.1	2.0	1.5	1.1	.5	.6	.5	.3	.1	.2	-	-
290	Iraq	AWASSI (Bagdad) wh, flcs, scd 2/	1,200	11.83	1.33	-	4.0	14.9	19.9	18.9	11.4	9.2	6.2	4.7	3.2	2.5	2.1	1.3	.7	.4	.3	.1	.1	.1	-
230	Iran	IRANIAN (Persian) gr, pul, scd 2/	1,200	12.00	5.17	-	1.8	13.3	21.5	19.1	11.9	9.3	6.5	5.0	4.8	2.9	2.0	1.0	.5	.3	.1	-	-	-	-
251	Iran	IRANIAN (Persian) gr, pul, clp, clr, md	1,200	11.84	12.59	-	2.5	10.7	19.0	16.9	13.8	7.8	5.4	4.3	4.3	4.4	2.8	2.7	2.0	1.1	1.1	.2	.2	.4	.4
282	Iran	IRANIAN (Persian) gr, pul, gry	1,200	20.67	4.17	-	1.6	10.0	16.6	19.2	14.0	8.6	7.1	7.9	5.4	3.7	2.3	1.2	.9	.7	.2	.2	.2	.2	-
450	Iran	IRANIAN (Persian) gr, pul, wh, scd 2/	1,200	15.00	3.50	-	.7	5.2	12.6	17.6	15.0	11.3	7.6	6.0	6.9	4.0	4.1	3.3	2.4	1.5	.3	.1	.5	.2	.7
461	Iran	IRANIAN (Persian) gr, pul, wh, scd 2/	1,200	8.50	2.42	-	2.0	12.0	19.9	17.6	12.6	7.9	6.5	5.0	4.9	3.8	2.6	1.7	1.4	1.3	.4	-	.2	.1	.1
471	Iran	IRANIAN (Persian) gr, pul, off-wh, scd 2/																							
170	India	JORIA (E Indian) gr, shn, wh, scd 2/	1,200	46.67	12.50	-	.3	5.4	12.6	17.8	17.8	12.0	11.5	9.0	5.5	3.5	2.1	1.4	.8	-	.2	.1	-	-	-
240	India	VICANERE (E Indian) gr, shn, wh	1,200	45.75	8.00	-	1.5	7.9	17.8	21.5	17.0	11.8	7.5	6.4	4.2	2.2	1.1	.9	.1	.1	-	-	-	-	-
402	India	BICANERE (E Indian) gr, shn, sup wh, scd 2/	1,200	38.42	9.00	-	1.2	6.8	18.0	20.3	16.2	10.5	7.9	7.2	4.1	3.0	1.4	1.8	.8	.2	.4	.1	-	-	.1
410	India	BICANERE (E Indian) gr, shn, wh, scd 2/	1,200	35.00	6.09	-	1.1	5.8	13.5	19.8	18.9	12.6	8.2	6.4	5.8	2.9	2.0	1.7	.8	.3	.2	-	-	-	-
460	India	BICANERE (E Indian) gr, shn, wh, scd 2/																							
200	India	E INDIAN gr, shn, wh, scd 2/	1,200	11.59	10.33	3.2	16.7	25.1	21.5	9.4	5.2	3.5	3.5	1.4	1.9	1.8	1.5	1.2	.8	1.5	.1	.8	.2	-	.7
401	Pak.	MONTGOMERY (E Indian) sup wh, scd, pul	1,200	18.59	10.09	-	4.9	16.7	20.5	15.0	12.8	8.2	5.9	3.0	2.0	2.4	1.9	2.3	.6	1.2	1.4	.2	.3	.3	.4
252	Pak.	MONTGOMERY (E Indian) gr, shn, pale yel	1,200	18.08	8.42	-	3.0	13.7	22.9	19.6	11.1	7.3	5.1	4.1	3.5	2.0	1.7	2.2	1.7	.2	.4	.2	.2	.4	.7
452	Pak.	MONTGOMERY (E Indian) gr, shn, yel, scd 2/																							
490	Pak.	MONTGOMERY (E Indian) scd, pul, yel																							
492	Pak.	E INDIAN gr, shn, yel, scd 2/																							
201	Pak.	PAKISTAN (E Indian) gr, shn, scd, 2/ wh	1,200	14.92	4.25	-	5.7	31.5	20.1	12.3	8.0	8.1	6.5	2.8	2.5	1.2	.5	.4	.3	.1	-	-	-	-	-
180	Pak.	KHORRASSAN (E Indian) gr. shn, sup, wh, scd 2/	1,200	14.67	9.17	-	3.6	19.3	24.4	16.6	11.5	7.8	6.2	3.7	3.3	1.3	.9	.8	.4	.1	.1	-	-	-	-
430	Pak.	KHORRASSAN (E Indian) gr, shn, wh, scd 2/																							
421	Afgn.	KANDAHAR (E Indian) gr, shn, wh, scd 2/	1,200	10.00	2.50	-	4.6	17.3	22.9	16.5	11.6	7.9	4.3	3.6	3.0	2.9	2.0	1.2	.8	.5	.3	.2	.2	.1	.1
411	Pak.	KANDAHAR (E Indian) gr, shn, sup wh, scd 2/	1,200	15.75	4.75	-	2.4	15.5	23.2	17.8	12.2	6.5	6.7	3.7	4.6	1.8	1.3	1.7	1.3	.5	.4	-	.1	-	.3
183	O.Mon	MONGOLIAN wsh, pul, wh, scd 2/	1,200	4.25	6.84	3.6	24.1	33.8	19.8	8.6	4.3	2.1	1.1	1.1	.6	.3	.5	.1	-	-	-	-	-	-	-
440	O.Mon	MONGOLIAN gr, shn, wh, scd 2/	1,200	1.50	7.09	2.7	22.4	32.8	19.3	9.5	4.2	3.0	2.0	.9	.9	.7	.6	.4	.2	.1	-	.1	-	.1	.1
462	USSR	MONGOLIAN shn, wsh, wh, scd 2/	1,200	1.83	6.33	-	12.6	34.6	24.8	13.1	4.6	1.7	1.0	.6	.6	.7	.5	1.3	.8	.4	1.0	.3	.4	.1	.9
272	Ire.	BLACKFACE gr, shn, mach	1,200	17.09	4.67	-	3.6	16.2	20.3	20.1	15.3	9.1	5.5	3.3	1.6	1.9	1.2	.9	.6	.3	.1	-	-	-	-
291	U S Af	KARAKUL shn, scd, lt gry	1,200	10.50	1.42	-	2.5	16.4	23.7	17.6	8.9	8.1	7.4	4.4	3.3	2.6	2.4	1.2	.7	.2	-	.2	.2	.1	.1
380	U S Af	KARAKUL gr, shn, lt gry	1,600	9.94	4.25	-	4.2	22.7	20.7	15.7	9.6	7.5	6.2	5.6	3.0	2.2	1.7	.8	.1	-	-	-	-	-	-
281	Yugo.	ZACKEL gr, pul, lt gry	1,200	23.00	.42	-	.5	4.6	11.3	18.4	14.2	13.7	8.2	5.2	6.3	5.1	4.9	2.3	1.1	1.5	.9	.5	.1	.4	.8

See footnotes at end of table.

Table 3.—**Results of micron analysis of 146 samples** of wool: Laboratory B—Continued

Sample No.	Origin	Description and customs (visual) classification 1/	Total fibers counted	Percent medullated fibers	Percent kemp fibers	Percentage of fibers in each micron cell																		
						5.00 to 9.99	10.00 to 14.99	15.00 to 19.99	20.00 to 24.99	25.00 to 29.99	30.00 to 34.99	35.00 to 39.99	40.00 to 44.99	45.00 to 49.99	50.00 to 54.99	55.00 to 59.99	60.00 to 64.99	65.00 to 69.99	70.00 to 74.99	75.00 to 79.99	80.00 to 84.99	85.00 to 89.99	90.00 to 94.99	95.00 to 99.99	100.00 and over
		UNIMPROVED—Continued																						
		Mixtures of named and improved																						
123	Arg.	CORDOVA and nf/40s shn, scd	1,200	6.59	0.25	–	1.4	13.4	23.8	20.4	12.5	11.2	8.6	2.8	2.3	1.9	0.9	0.5	0.2	–	–	0.1	–	–	–
355	Arg.	CORDOVA and nf/40s gr, shn	1,600	4.51	.50	–	1.1	10.2	22.9	26.1	13.8	10.1	7.5	4.0	2.0	1.2	.5	.4	.1	–	0.1	–	–	–	–
481	Arg.	CORDOVA and nf/40s gr, shn	1,200	5.67	.09	–	2.2	13.9	20.2	21.3	16.0	11.2	6.9	4.2	1.8	.9	.5	.4	.1	0.1	.2	–	0.1	–	–
150	Scot.	SCOTCH BLACKFACE and nf/40s gr, flcs	1,200	31.25	2.25	–	1.1	6.9	13.7	20.7	18.0	11.7	8.0	7.8	4.6	2.9	1.4	.7	.7	.2	.3	.3	.3	0.1	0.6
120	Italy	SARDINIAN and nf/40s gr, pul	1,200	9.92	10.25	–	4.8	14.8	20.3	17.1	12.0	5.4	4.6	3.0	3.4	3.5	2.1	2.0	1.7	1.0	1.0	–	.7	.5	2.1
		Carpet blends																						
160	U.K.	LONDONSHIRE scd, shn, pul, wh	1,200	13.92	2.59	0.1	7.3	15.5	15.9	13.2	12.9	9.5	8.0	5.6	4.1	2.7	1.6	1.1	.7	.6	.3	.3	.2	.2	.2
420	U.K.	ENGLISH gr, shn, wh	1,200	23.50	4.83	–	3.5	8.6	18.4	18.1	15.6	11.5	8.5	4.3	2.8	2.4	2.0	1.3	.9	.3	.7	.1	.2	.3	.5
442	U.K.	WELSH gr, pul																						
441	U.K.	ENGLISH CROSSBRED 3/ gr, shn																						
232	Neth.	HOLLAND scd, shn, wh	1,200	8.33	3.33	.2	7.4	16.6	21.4	19.3	12.1	9.9	4.1	1.7	1.3	1.3	.7	.5	.6	.6	.9	.6	.2	–	.6
242	Neth.	HOLLAND scd, shn, wh	1,200	7.92	3.42	–	3.5	10.3	18.2	18.3	17.8	12.8	7.2	4.8	2.2	.6	.9	.8	.8	.4	.5	.1	.1	.2	.5
412	Neth.	HOLLAND scd, shn, pul, wh																						
422	Neth.	HOLLAND scd, shn, pul, wh																						
		IMPROVED																						
		Not finer than 40s																						
331	N.Z.	FELT flcs, fe	1,200	5.17	–	–	.1	3.5	6.1	13.8	18.5	21.2	19.3	11.2	4.3	1.8	.1	.1	–	–	–	–	–	–	–
351	N.Z.	FELT flcs, fe	1,200	3.34	.09	–	–	2.4	6.0	10.3	19.9	21.5	18.7	12.3	5.9	2.2	.5	.2	.1	–	–	–	–	–	–
371	N.Z.	FELT flcs, fe	1,200	4.84	.09	–	.2	1.6	6.6	11.6	18.8	22.3	20.5	11.9	4.7	1.6	.2	–	–	–	–	–	–	–	–
261	N.Z.	SOFT COTTED flcs, fe	1,200	5.25	.09	–	1.0	3.2	12.9	19.3	19.8	17.7	14.2	6.5	3.8	.6	.4	.4	.1	.1	–	–	–	–	–
105	N.Z.	"B" style, flcs, fe	1,200	7.42	.67	–	.2	1.2	8.3	14.1	18.2	21.0	19.3	9.8	4.8	1.4	1.0	.5	.1	.1	–	–	–	–	–
340	N.Z.	"B" style, es, flcs	1,200	3.83	.09	–	.4	2.0	6.9	13.6	20.6	20.3	15.4	13.7	4.8	1.6	.4	.1	.1	.1	–	–	–	–	–
330	N.Z.	EARLY SHORN flcs	1,200	3.09	–	–	.6	3.1	9.3	15.5	18.5	20.2	18.9	9.7	3.1	.7	.4	–	–	–	–	–	–	–	–
115	N.Z.	2d SHEAR gr, shn	1,200	7.17	–	–	.3	1.3	6.8	16.4	20.0	17.2	17.8	10.4	5.7	2.4	1.1	.6	–	–	–	–	–	–	–
335	N.Z.	2d SHEAR gr, shn	1,200	2.50	–	–	.5	5.5	11.6	20.6	18.8	16.3	12.7	8.7	3.3	1.4	.5	.1	–	–	–	–	–	–	–
135	N.Z.	PULLED gr, fe	1,200	7.09	.25	–	.4	3.0	8.0	11.9	17.8	23.3	18.0	9.5	5.3	2.2	.4	.1	.1	–	–	–	–	–	–
101	N.Z.	CRUTCHINGS gr, shn	1,200	17.84	.59	–	.1	3.1	7.6	17.2	18.5	18.7	14.7	11.3	4.9	2.0	1.1	.6	–	.1	.1	–	–	–	–
145	N.Z.	CRUTCHINGS gr, shn																							
162	N.Z.	CRUTCHINGS gr, shn	1,200	16.25	.67	–	.3	2.9	8.5	16.2	16.0	16.7	17.4	11.7	6.2	2.2	.8	.5	.2	.2	.1	–	–	.1	–
165	N.Z.	CRUTCHINGS gr, shn	1,200	19.92	.25	–	.5	1.1	5.1	13.2	21.4	18.8	18.6	12.4	5.8	1.8	.6	.4	.1	.1	.1	–	–	–	–
185	N.Z.	CRUTCHINGS gr, shn																							
195	N.Z.	CRUTCHINGS gr, shn	1,200	12.09	.17	–	.9	1.8	6.5	14.6	20.8	17.7	14.2	12.4	6.9	2.5	1.1	.5	–	–	.1	–	–	–	–
320	N.Z.	CRUTCHINGS gr, shn	1,200	13.83	1.17	–	.7	3.7	10.7	18.6	19.9	14.9	13.4	7.9	6.2	1.8	1.3	.4	.4	.1	–	–	–	–	–
103	Arg.	BA 5/6s Nov, scd, shn	1,200	10.67	.09	–	.4	2.9	10.0	12.8	20.6	20.5	16.3	6.8	4.5	3.4	1.0	.5	.1	.2	–	–	–	–	–
182	Arg.	BA 5/6s Nov, gr, shn																							
202	Arg.	BA 5/6s Nov, scd, shn																							
212	Arg.	BA 5/6s Mar, gr, shn																							
222	Arg.	BA 5/6s Mar, scd, shn	1,200	7.00	.17	–	.8	3.7	10.3	17.2	16.7	21.9	14.8	8.5	3.9	1.5	.6	.1	–	–	–	–	–	–	–
491	Arg.	BA 5/6s Nov, gr, shn, long																							
231	Arg.	BA 5/6s pul, wsh																							
370	Arg.	BA 5/6s gr, pul, fe	1,600	5.75	1.82	–	.6	4.2	12.1	14.9	16.6	21.2	15.9	8.1	3.5	1.6	.8	.5	–	–	–	–	–	–	–
400	Arg.	BA 5/6s gr, pul																							
172	Arg.	BA 5/6s gr, pul, 3/4 in	1,200	8.59	.33	–	1.0	5.5	12.9	15.3	16.4	19.5	13.4	8.3	5.1	1.1	.6	.4	.1	.1	.1	.1	.1	–	–
470	Arg.	BA 5/6s gr, pul, 3/4 in																							
192	Arg.	BA 5/6s shn, scd																							
350	Arg.	BA 5/6s shn, scd, ce	1,600	2.00	.13	–	.5	2.5	11.9	15.6	18.5	18.9	17.9	8.2	3.5	1.2	1.0	.2	.1	–	–	–	–	–	–
360	Arg.	BA 5/6s gr, shn, sup lb	1,600	5.94	.19	–	.7	7.1	23.1	26.1	16.9	9.6	8.6	4.5	1.5	1.1	.4	.3	.1	–	–	–	–	–	–
113	Arg.	BA 5/6s scd, bur, shn	1,200	15.09	.09	–	1.6	7.4	14.9	16.2	19.2	18.4	9.5	7.5	3.1	.9	.6	.4	.1	–	.1	–	.1	–	–
305	W.Ger.	flcs	1,200	12.59	–	–	.4	6.1	12.1	18.9	19.8	15.4	9.9	7.0	6.3	2.7	1.3	.1	–	–	–	–	–	–	–
310	W.Ger.	flcs	1,200	12.75	.09	–	1.0	6.2	11.1	19.8	19.4	16.3	12.2	6.5	4.2	2.4	.7	.2	–	–	–	–	–	–	–
432	W.Ger.	Eider flcs, fe	1,200	17.25	.83	–	.1	2.3	8.1	16.7	20.6	21.1	14.9	7.9	4.1	2.4	.9	.5	.2	.2	.1	.1	–	–	–
315	Ire.	Wethers flcs, fe	1,200	8.84	–	–	.6	1.3	7.7	16.9	20.9	20.6	18.0	8.6	3.4	1.3	.6	–	.1	–	–	–	–	–	–
223	Ire.	Wethers felt flcs, fe, slt	1,200	18.33	.67	–	.7	2.1	8.4	12.9	18.3	20.9	18.0	9.3	5.2	2.2	1.1	.6	.2	.1	–	–	–	–	–
4/ 280	Ire.	Crossbred gr, shn	1,200	23.67	.75	–	.7	4.5	6.7	13.3	18.9	18.8	18.9	10.1	4.8	1.7	1.0	.3	–	.1	.1	–	–	–	–
472	Ire.	Crossbred flcs, fe	1,200	31.50	.83	–	1.0	3.8	10.1	15.4	15.7	19.7	16.6	9.2	3.9	2.7	.7	.8	.2	.2	–	–	–	–	–
220	U.K.	Devon sc	1,200	48.09	1.34	–	.7	3.0	9.3	14.1	19.3	17.6	14.4	9.4	6.0	2.9	1.5	.7	.3	.2	–	.2	.1	.2	.1
262	U.K.	DEVON flcs	1,200	30.67	4.17	–	.1	.9	2.6	7.2	13.4	13.4	21.9	16.8	11.7	5.5	3.2	1.5	1.0	.4	.3	–	.1	–	–
312	Uru.	cb flcs, low mixed quality	1,200	18.17	–	–	.4	3.3	8.3	14.3	15.5	24.2	15.7	10.4	5.7	.8	.5	.5	.3	.1	–	–	–	–	–
322	Uru.	cb flcs, low mixed quality	1,200	4.33	–	–	.6	3.9	8.1	18.7	24.9	20.9	15.2	5.2	1.6	.6	.2	.1	–	–	–	–	–	–	–

See footnotes at end of table.

Table 3.—**Results of micron analysis of 146 samples** of wool: Laboratory B--Continued

Sample No.	Origin	Description and customs (visual) classification 1/	Total fibers counted	Percent medullated fibers	Percent kemp fibers	Percentage of fibers in each micron cell																				
						5.00 to 9.99	10.00 to 14.99	15.00 to 19.99	20.00 to 24.99	25.00 to 29.99	30.00 to 34.99	35.00 to 39.99	40.00 to 44.99	45.00 to 49.99	50.00 to 54.99	55.00 to 59.99	60.00 to 64.99	65.00 to 69.99	70.00 to 74.99	75.00 to 79.99	80.00 to 84.99	85.00 to 89.99	90.00 to 94.99	95.00 to 99.99	100.00 and over
		IMPROVED--Continued																								
		Finer than 40s, not finer than 44s																								
301	N.Z.	FELT flcs, ce	1,200	5.72	0.09	-:	0.5:	1.3:	7.3:	15.0:	20.5:	17.7:	18.9:	12.8:	3.8:	1.5:	0.5:	0.1:	0.1:	-:	-:	-:	-:	-:	-:	-
341	N.Z.	FELT flcs, ce	1,200	4.17	-	-:	-:	2.1:	5.9:	13.7:	20.2:	24.3:	17.0:	11.1:	4.4:	1.0:	.2:	.1:	-:	-:	-:	-:	-:	-:	-:	-
345	N.Z.	FELT flcs, ce	1,200	2.84	.19	-:	.3:	2.1:	7.9:	15.1:	19.4:	21.1:	17.1:	10.0:	5.1:	1.6:	.3:	-:	-:	-:	-:	-:	-:	-:	-:	-
361	N.Z.	FELT flcs, ce	1,200	4.25	-	-:	.7:	2.5:	6.5:	14.7:	18.5:	20.6:	20.0:	10.0:	4.3:	1.4:	.6:	.2:	-:	-:	-:	-:	-:	-:	-:	-
321	N.Z.	FELT flcs, ce	1,200	2.17	-	-:	-:	2.3:	8.1:	14.6:	19.5:	21.6:	18.2:	9.9:	3.7:	1.5:	.5:	.1:	-:	-:	-:	-:	-:	-:	-:	-
213	N.Z.	FELT gr, pul, fe	1,200	6.50	-	-:	.5:	2.1:	6.6:	14.2:	22.6:	17.9:	16.0:	12.2:	5.3:	1.7:	.6:	.3:	-:	-:	-:	-:	-:	-:	-:	-
253	N.Z.	"B" flcs, fe	1,200	6.17	.09	-:	.4:	2.8:	5.6:	12.6:	20.2:	21.9:	19.3:	9.0:	5.3:	2.2:	.4:	.2:	.1:	-:	-:	-:	-:	-:	-:	-:	-
190	N.Z.	"B" flcs, ce	1,200	3.17	.17	-:	1.2:	4.4:	12.3:	17.6:	21.6:	19.3:	12.1:	7.3:	2.6:	.9:	.4:	.1:	-:	0.1:	0.1:	-:	-:	-:	-:	-
325	N.Z.	EARLY SHORN flcs	1,200	4.92	.09	-:	.5:	1.7:	9.1:	18.1:	20.4:	18.6:	13.6:	10.3:	5.2:	1.7:	.7:	-:	.1:	-:	-:	-:	-:	-:	-:	-
161	N.Z.	2d SHEAR gr, shn	1,200	7.17	.17	-:	.2:	.9:	7.6:	12.7:	16.1:	19.9:	19.1:	10.8:	9.0:	2.2:	1.0:	.4:	.1:	-:	-:	-:	-:	-:	-:	-:	-
102	N.Z.	CRUTCHINGS gr, shn	1,200	14.00	.33	-:	.2:	1.6:	6.0:	10.9:	16.9:	18.0:	17.7:	13.3:	8.2:	3.9:	2.0:	.8:	.3:	-:	.1:	-:	0.1:	-:	-:	-
112	N.Z.	CRUTCHINGS gr, shn	1,200	13.75	.42	-:	.4:	2.5:	6.3:	10.5:	19.4:	15.8:	14.7:	12.6:	9.4:	5.2:	1.6:	.8:	.2:	.3:	.2:	0.1:	-:	-:	-:	-
191	N.Z.	CRUTCHINGS gr, shn	1,200	16.17	.09	-:	.3:	3.7:	6.0:	10.3:	13.5:	17.5:	17.9:	13.5:	8.6:	3.8:	3.3:	1.2:	.1:	.1:	.1:	-:	-:	-:	0.1	-
121	N.Z.	CRUTCHINGS blend, gr, shn	1,200	9.42	.09	-:	.6:	3.4:	11.9:	18.2:	21.8:	15.7:	14.9:	7.1:	4.0:	1.4:	.5:	.2:	.1:	.1:	.1:	-:	-:	-:	-	
131	N.Z.	CRUTCHINGS blend, gr, shn																								
141	N.Z.	CRUTCHINGS blend, gr, shn	1,200	11.33	.17	-:	1.3:	3.4:	14.0:	18.0:	19.0:	17.5:	11.5:	7.4:	3.9:	2.5:	1.0:	.3:	.2:	-:	-:	-:	-:	-:	-:	-
271	N.Z.	DAG scd, shn	1,200	9.50	-	-:	.7:	5.3:	13.3:	19.9:	20.7:	14.9:	11.2:	7.0:	4.3:	1.9:	.3:	.4:	-:	-:	.1:	-:	-:	-:	-:	-
203	Ire.	FELT wethers, flcs, sup, slt, ce	1,200	33.42	.59	-:	.7:	2.9:	5.1:	12.4:	19.6:	23.3:	17.1:	11.4:	3.2:	1.9:	1.4:	.4:	.3:	-:	-:	.2:	-:	0.1:	-:	-
292	Ire.	FELT wethers, flcs, sup, slt, fe	1,200	24.75	.75	-:	1.4:	5.0:	9.0:	14.7:	19.9:	20.4:	14.2:	8.6:	3.5:	1.7:	1.1:	.2:	.2:	.1:	-:	-:	-:	-:	-:	-
233	Austl:	"B" flcs	1,200	12.83	.50	-:	.4:	3.1:	8.3:	16.7:	20.8:	20.9:	16.3:	7.8:	3.2:	1.4:	.5:	.2:	-:	.1:	.1:	-:	-:	-:	-:	-
365	Uru.	MONTE CRIOLLA gr, shn	1,600	9.32	.76	-:	.6:	8.4:	19.0:	20.2:	19.6:	15.2:	8.5:	5.1:	1.3:	.9:	.7:	.3:	-:	.1:	-:	.1:	-:	-:	.2
		Finer than 44s, not finer than 46s																								
302	N.Z.	FELT gr, pul	1,200	24.75	-	-:	.7:	5.8:	11.8:	19.7:	20.3:	17.2:	13.3:	5.7:	3.2:	1.1:	.8:	.2:	.2:	-:	-:	-:	-:	-:	-:	-
311	N.Z.	FELT gr, pul	1,200	16.17	.09	-:	.5:	5.7:	16.9:	24.1:	21.2:	15.9:	8.9:	4.9:	1.4:	.4:	-:	.1:	-:	-:	-:	-:	-:	-:	-:	-
381	N.Z.	FELT gr, pul	1,200	13.00	-	-:	.4:	4.6:	11.6:	21.7:	23.5:	15.6:	13.2:	5.5:	2.7:	.8:	.2:	.2:	-:	-:	-:	-:	-:	-:	-:	-
391	N.Z.	FELT gr, pul	1,200	13.33	.17	-:	.8:	6.3:	13.0:	21.1:	23.2:	17.3:	11.5:	4.8:	1.5:	.4:	-:	.1:	-:	-:	-:	-:	-:	-:	-:	-
142	N.Z.	"B" flcs, fe	1,200	4.25	-	-:	.5:	4.4:	12.3:	16.2:	21.8:	21.4:	12.9:	6.5:	2.6:	.7:	.4:	.3:	-:	-:	-:	-:	-:	-:	-:	-
243	N.Z.	"C" flcs, ce	1,200	5.59	.09	-:	.2:	3.2:	7.0:	15.4:	19.6:	21.7:	17.0:	8.0:	4.5:	2.2:	.8:	.3:	.1:	-:	-:	-:	-:	-:	-:	-
171	N.Z.	2d SHEAR gr, shn	1,200	9.50	-	-:	.3:	2.4:	9.8:	15.7:	20.3:	21.3:	12.5:	10.2:	4.6:	1.7:	1.0:	.2:	-:	-:	-:	-:	-:	-:	-:	-
152	N.Z.	CRUTCHINGS gr, shn	1,200	15.50	-	-:	.2:	2.6:	7.8:	17.5:	22.3:	21.5:	15.1:	8.0:	3.1:	1.2:	.4:	.1:	.1:	-:	-:	.1:	-:	-:	-:	-
		Finer than 46s																								
181	N.Z.	"B" flcs	1,200	5.67	.09	-:	.8:	5.4:	11.0:	19.9:	21.5:	19.4:	12.5:	6.4:	2.2:	.6:	.2:	.1:	-:	-:	-:	-:	-:	-:	-:	-
122	N.Z.	2d SHEAR gr, shn	1,200	6.25	.09	-:	.2:	4.4:	10.7:	24.1:	21.4:	16.7:	11.6:	6.4:	2.7:	.7:	.8:	.2:	-:	-:	.1:	-:	-:	-:	-:	-
132	N.Z.	2d SHEAR gr, shn	1,200	7.00	.09	-:	.6:	3.6:	12.7:	22.4:	19.7:	18.4:	11.5:	7.3:	2.0:	1.0:	.6:	.2:	-:	-:	-:	-:	-:	-:	-:	-
151	N.Z.	2d SHEAR gr, shn	1,200	5.92	-	-:	.7:	3.6:	12.7:	17.2:	21.0:	19.1:	14.5:	6.4:	2.8:	1.2:	.4:	.4:	-:	-:	-:	-:	-:	-:	-:	-
		Composite grades (bales mixed)																								
111	N.Z.	44s-46s 2d sh, gr, shn																								
125	N.Z.	nf/40s-44s-46s gr, pul																								
155	N.Z.	nf/40s-44s-46s 2d sh, gr, shn																								
175	N.Z.	nf/40s-44s-46s 2d sh, gr, shn																								

1/ Designations: bur, burry; cb, combing; ce, toward coarse edge of customs grade; clp, clipped; clr, colored; es, early shorn; fe, toward fine edge of customs grade; felt, papermakers' felt type; flcs, fleeces; fn, fawn; gr, greasy; gry, gray; in, inches in length of fiber; kpy, kempy; lb, lambs (wool); lt, light; mach, machined; Mar, shorn in March; md, moth damage; nf/40s, not finer than 40s; Nov, shorn in November; pcs, pieces; pul, pulled; scd, scoured; 2d sh, second shear; shn, shorn; slt, selected; srt, sorted; sup, super; wh, white; wsh, washed; yel, yellow; 44s, finer than 40s and not finer than 44s; 46s, finer than 44s and not finer than 46s.

2/ Washed with water after shearing or pulling and consequently considered scoured by customs.

3/ Complaint filed by buyer that this lot was merely a mixed lot and not the standard English blend.

4/ Sample No. 280 was originally classified as an Irish Blackface by mistake; the wool was reexamined and regraded after it was discovered that this classification was out of line with its micron grade and with the hand sample that was taken.

Table 4.--Results of micron analysis of 146 samples of wool: Laboratory C

Sample No.	Origin	Description and customs (visual) classification 1/	Total fibers counted	Percent medullated fibers	Percent kemp fibers	Percentage of fibers in each micron cell																				
						5.00 to 9.99	10.00 to 14.99	15.00 to 19.99	20.00 to 24.99	25.00 to 29.99	30.00 to 34.99	35.00 to 39.99	40.00 to 44.99	45.00 to 49.99	50.00 to 54.99	55.00 to 59.99	60.00 to 64.99	65.00 to 69.99	70.00 to 74.99	75.00 to 79.99	80.00 to 84.99	85.00 to 89.99	90.00 to 94.99	95.00 to 99.99	100.00 and over
		UNIMPROVED																								
		Named and similar																								
241	Arg.	CORDOVA gr, shn	1,218	12.2	-	0.2	2.0	14.2	19.6	17.9	13.8	9.6	9.7	7.2	2.2	1.1	0.8	0.6	0.2	0.2	0.2	0.2	0.2	0.1	-
130	Scot.	SCOTCH BLACKFACE slt, flcs	1,222	37.7	7.4	-	.8	9.4	14.9	17.6	15.0	9.9	9.3	6.0	2.9	2.4	1.6	1.8	-	.6	.4	.8	.5	.6	5.5
140	Scot.	SCOTCH BLACKFACE srt, wh	1,229	35.7	6.6	-	1.4	9.1	17.6	19.7	13.7	12.0	7.1	6.5	1.2	1.4	1.8	2.4	-	.7	.2	.5	.6	.6	3.5
250	Scot.	SCOTCH BLACKFACE gr, shn, mach	1,218	42.8	5.5	-	.7	8.5	16.3	16.0	16.3	10.9	9.2	6.8	2.3	2.8	2.1	2.5	-	1.2	-	.3	.2	1.2	2.7
451	Scot.	SCOTCH BLACKFACE slt, flcs	1,273	26.3	5.7	-	2.5	11.1	17.9	18.2	13.6	11.1	7.5	7.0	1.7	1.6	1.7	1.0	.5	.2	.5	.1	.4	-	3.4
375	Scot.	HASLOCK wh, gr, pul	1,276	34.4	6.7	-	1.1	6.9	16.8	20.4	13.9	10.3	9.6	8.5	1.6	2.0	1.6	2.2	.4	.7	.7	.7	.1	.6	1.9
163	Eng.	WELSH MOUNTAIN flcs	1,242	15.9	2.6	-	1.1	10.7	19.6	20.0	20.7	11.0	7.1	5.2	.7	.6	.2	.6	-	.2	-	.2	.1	.2	1.8
173	Eng.	WELSH MOUNTAIN wh, gr, pul	1,223	19.0	-	-	1.1	6.8	18.6	21.7	17.0	12.3	8.7	6.6	2.1	1.2	.8	.8	-	.4	-	.6	.2	-	1.1
482	Ire.	WELSH MOUNTAIN scd, kpy, flcs	1,246	9.3	5.1	-	1.8	11.6	23.0	23.8	16.3	9.4	4.9	2.6	.4	.7	.2	.6	.6	.2	.1	.1	.7	.2	2.8
133	Malta	CYPRUS wh, flcs	1,258	20.1	3.7	-	3.7	17.1	18.9	14.8	10.9	9.3	7.5	6.7	1.5	2.1	1.7	2.1	-	.3	.2	.2	.4	.6	2.0
143	Malta	CYPRUS wh, flcs	1,233	18.9	2.6	-	1.9	14.7	19.3	18.2	12.1	8.0	6.9	7.0	2.2	2.2	1.3	3.4	-	.3	.1	.1	.2	.3	1.8
153	Malta	CYPRUS wh, flcs	1,220	13.2	1.4	-	3.0	18.6	22.3	14.9	10.7	7.5	8.4	7.8	.9	1.4	1.6	1.5	-	.3	-	.3	.1	.1	.6
100	Italy	SARDINIAN lb, shn, scd	1,239	27.0	3.8	-	1.3	14.1	18.8	15.6	7.6	8.3	6.8	9.9	3.0	3.6	3.0	4.0	.1	.8	.2	.3	.2	.9	1.5
110	Italy	SARDINIAN shn, scd	1,235	11.9	2.4	.1	9.1	20.2	19.3	13.4	8.6	5.7	5.3	4.7	1.8	2.4	1.9	2.9	-	.7	.7	.7	.1	.5	1.9
211	Syria	ALEPPO flcs, scd 2/	1,217	10.7	2.3	-	3.6	13.1	19.1	15.5	12.3	9.2	7.6	8.4	3.9	2.5	1.9	1.3	-	.3	-	.4	.1	.2	.6
221	Syria	ALEPPO gr, scd 2/	1,221	11.6	1.3	-	2.5	14.2	20.4	16.1	12.4	9.5	8.3	8.0	2.0	2.0	1.2	1.6	-	.3	.2	.2	.2	.5	.4
385	Syria	ALEPPO gr, pul, wh, scd 2/	1,243	9.9	3.2	-	1.5	8.8	19.8	21.1	11.6	9.5	6.0	7.6	3.0	2.6	2.2	2.4	.5	1.0	.1	1.0	.1	.2	1.0
390	Syria	ALEPPO gr, pul, wh, scd 2/	1,230	8.6	1.4	-	2.8	13.5	19.2	19.1	11.3	9.8	8.0	6.7	2.5	2.0	1.9	1.2	.4	.5	.2	.2	.1	.2	.4
395	Syria	ALEPPO gr, pul, wh, scd 2/	1,245	10.1	3.4	-	.6	10.0	19.7	17.8	11.2	9.2	6.2	7.9	2.7	4.1	2.5	1.9	.2	1.6	.8	.5	.5	.8	1.8
480	Syria	ALEPPO flcs, lst wh, scd 2/	1,212	9.2	2.1	-	2.6	12.5	21.2	17.8	11.8	9.4	6.8	7.8	2.2	2.0	3.0	1.2	-	.4	.2	.3	-	.4	.4
260	Iraq	AWASSI (Bagdad) wh, flcs, scd 2/	1,212	6.0	1.7	-	2.9	15.7	20.0	16.6	13.0	8.9	7.3	7.3	2.5	2.2	1.2	1.0	-	.3	.2	.2	.1	.2	.4
210	Iraq	AWASSI (Bagdad) wh, flcs, scd 2/	1,214	6.0	1.0	-	3.8	16.8	20.9	18.0	9.9	7.0	8.3	6.8	2.6	2.6	.9	1.1	-	.4	-	.1	-	.3	.5
270	Iraq	AWASSI (Bagdad) gr, pcs, fn, scd 2/	1,204	10.8	-	-	4.6	16.2	24.3	17.6	10.3	8.9	7.4	4.9	1.2	1.6	1.0	1.2	.1	.1	-	.2	-	.2	.2
290	Iraq	AWASSI (Bagdad) wh, flcs, scd 2/	1,221	8.5	1.2	-	4.1	14.6	19.8	16.1	11.8	8.9	8.0	7.5	2.3	2.2	1.6	1.6	.4	.2	.1	.5	.1	-	.2
230	Iran	IRANIAN (Persian) gr, pul, scd 2/	1,216	10.0	2.9	-	.9	10.0	16.4	19.5	14.6	10.1	7.7	7.6	3.0	3.0	1.3	2.9	.1	.7	-	.5	-	.3	1.4
251	Iran	IRANIAN (Persian) gr, pul, clp, clr, md	1,207	6.5	3.2	-	1.3	11.8	17.9	17.8	12.7	7.7	7.6	8.0	2.5	3.2	2.1	4.1	-	.2	.8	.3	.4	.3	1.3
282	Iran	IRANIAN (Persian) gr, pul, gry	1,222	10.1	3.4	-	.9	8.3	15.8	19.3	11.5	10.5	9.0	9.9	3.3	2.2	3.0	2.9	-	.6	-	.6	-	.4	1.8
150	Iran	IRANIAN (Persian) gr, pul, wh, scd 2/	1,237	10.7	2.7	-	1.0	7.5	19.8	15.1	13.1	11.5	7.4	8.2	3.6	4.1	2.7	3.1	.2	.3	.4	.4	-	.6	1.0
461	Iran	IRANIAN (Persian) gr, pul, wh, scd 2/	1,198	7.9	-	-	1.4	14.1	21.9	19.0	10.8	10.8	5.9	6.5	2.7	1.9	1.3	2.4	-	.2	.1	-	-	-	.2
471	Iran	IRANIAN (Persian) gr, pul, off-wh, scd 2/	1,251	9.2	2.5	-	.5	6.6	13.8	23.2	12.9	11.3	8.0	6.9	3.0	3.0	3.1	3.1	.1	1.1	.1	1.1	.2	.3	1.7
170	India	JORIA (E Indian) gr, shn, wh, scd 2/	1,216	50.8	6.3	-	.1	5.4	16.7	18.3	14.6	11.0	9.7	8.3	2.1	2.5	2.4	3.4	.1	.9	-	1.2	.4	1.1	1.8
240	India	VICANERE (E Indian) gr, shn, wh	1,213	41.5	3.3	-	1.2	7.7	15.4	17.9	18.5	11.6	8.4	7.1	2.0	2.6	1.2	3.0	.2	.8	.1	.2	.2	1.0	.9
402	India	BICANERE (E Indian) gr, shn, sup wh, scd 2/	1,213	42.6	4.6	-	1.5	9.4	18.0	18.4	16.9	10.0	8.3	8.6	1.9	1.8	1.7	1.7	.2	.7	.2	.3	.1	.2	.1
410	India	BICANERE (E Indian) gr, shn, wh, scd 2/	1,211	32.0	2.5	-	.9	9.4	19.3	18.7	18.1	10.7	7.6	7.3	2.0	1.1	1.7	1.5	.2	.7	-	.3	.1	.1	.3
460	India	BICANERE (E Indian) gr, shn, wh, scd 2/	1,211	24.2	2.5	-	2.5	12.9	19.9	19.8	15.0	9.4	7.2	5.3	1.1	2.1	.8	2.4	-	.6	.1	.4	.1	.1	.3
200	India	E INDIAN gr, shn, wh, scd 2/	1,218	14.6	8.4	.1	4.1	19.8	20.4	15.1	11.3	7.6	4.9	5.6	1.9	1.6	1.0	1.4	.3	.4	-	1.1	.3	.9	2.2
401	Pak.	MONTGOMERY (E Indian) sup wh, scd, pul	1,244	17.8	4.4	.1	4.9	21.7	21.3	14.8	10.0	9.2	5.1	4.7	1.6	1.5	.7	1.4	-	.7	.3	.5	.4	.3	.9
252	Pak.	MONTGOMERY (E Indian) gr, shn, pale yel	1,223	23.7	4.4	-	2.0	18.6	21.2	18.4	10.5	8.2	6.0	5.9	1.3	2.1	1.4	1.3	-	.1	.6	.8	.2	.8	.5
452	Pak.	MONTGOMERY (E Indian) gr, shn, yel, scd 2/	1,240	29.4	6.9	.1	.7	8.1	17.3	19.7	15.3	10.9	8.1	6.8	2.4	3.6	1.7	1.4	-	1.0	.3	.6	.2	.5	1.3
490	Pak.	MONTGOMERY (E Indian) scd, pul, yel	1,245	20.3	3.9	-	.6	6.2	17.2	20.2	14.3	11.0	8.3	6.9	3.0	2.7	2.2	2.6	.2	1.2	.8	-	1.2	-	1.4
492	Pak.	E INDIAN gr, shn, yel, scd 2/	1,227	19.6	7.4	-	1.1	10.4	19.4	20.4	13.7	10.7	6.7	4.2	2.1	2.5	1.4	1.7	.2	.9	.5	1.1	.5	.5	2.0
201	Pak.	PAKISTAN (E Indian) gr, shn, scd, 2/ wh	1,217	16.2	1.3	-	6.7	22.0	22.7	17.9	9.1	6.6	5.0	3.9	.7	1.1	1.1	1.3	-	.5	.3	.3	-	.2	.6
180	Pak.	KHORRASSAN (E Indian) gr, shn, sup wh, scd 2/	1,214	23.3	6.6	-	3.0	17.4	22.2	16.0	10.3	6.9	6.0	4.9	2.8	1.3	1.3	1.3	.2	1.1	.3	1.0	.5	1.2	2.3
430	Pak.	KHORRASSAN (E Indian) gr, shn, wh, scd 2/	1,210	18.5	3.7	-	5.6	22.4	20.7	18.1	8.6	7.4	5.5	4.1	1.2	1.2	.8	1.2	.1	.8	.2	.6	-	.3	1.2
421	Afghn.	KANDAHAR (E Indian) gr, shn, wh, scd 2/	1,220	7.5	2.2	-	6.8	25.6	20.1	15.7	8.4	5.5	4.9	5.6	1.1	2.2	1.4	.6	-	.4	.6	-	.4	-	.7
411	Pak.	KANDAHAR (E Indian) gr, shn, sup wh, scd 2/	1,207	15.4	2.7	-	2.0	16.6	26.6	19.4	9.6	5.8	6.0	4.4	2.1	1.3	1.4	2.1	-	.2	.2	-	.4	.3	1.6
183	O. Mon.	MONGOLIAN wsh, pul, wh, scd 2/	1,220	5.3	7.9	-	17.2	30.2	20.0	10.3	6.9	2.5	1.2	1.2	.2	.7	.2	1.8	-	.4	.7	-	.7	.1	5.7
440	O. Mon.	MONGOLIAN gr, shn, wh, scd 2/	1,214	3.5	6.9	.3	16.5	30.6	20.8	12.3	4.9	2.8	.9	1.6	.3	.5	.3	2.0	-	-	.5	1.0	.3	.5	3.9
462	USSR	MONGOLIAN shn, wsh, wh, scd 2/	1,242	4.2	6.0	.2	12.4	32.4	22.6	14.4	4.7	4.4	1.4	1.2	.4	.5	.4	1.4	-	.3	.1	.2	.6	.5	3.9
272	Ire.	BLACKFACE gr, shn, mach	1,219	22.3	3.9	-	2.6	12.4	18.1	16.9	17.4	11.5	6.5	5.1	1.6	1.6	1.6	1.0	.1	.2	.1	.5	.2	.2	2.4
291	U S Af.	KARAKUL shn, scd, lt gry	1,212	8.8	-	-	4.5	18.7	21.0	12.9	8.7	6.9	7.2	9.9	1.8	3.6	1.6	2.2	.4	.1	.1	.1	.2	.1	-
380	U S Af.	KARAKUL gr, shn, lt gry	1,212	9.8	-	-	3.5	19.7	19.5	13.2	10.3	8.8	7.0	9.2	2.2	2.9	1.3	1.5	.1	.3	.1	.1	.1	.1	.1
281	Yugo.	ZACKEL gr, pul, lt gry	1,234	10.1	2.4	-	.2	5.1	11.5	15.4	16.6	13.5	10.4	10.1	3.0	3.2	4.0	4.0	.1	.1	1.2	-	.4	.2	1.0

See footnotes at end of table.

Table 4.—**Results of micron analysis of 146 samples** of wool: Laboratory C—Continued

Sample No.	Origin	Description and customs (visual) classification 1/	Total fibers counted	Percent medullated fibers	Percent kemp fibers	Percentage of fibers in each micron cell																			
						5.00 to 9.99	10.00 to 14.99	15.00 to 19.99	20.00 to 24.99	25.00 to 29.99	30.00 to 34.99	35.00 to 39.99	40.00 to 44.99	45.00 to 49.99	50.00 to 54.99	55.00 to 59.99	60.00 to 64.99	65.00 to 69.99	70.00 to 74.99	75.00 to 79.99	80.00 to 84.99	85.00 to 89.99	90.00 to 94.99	95.00 to 99.99	100.00 and over
		UNIMPROVED—Continued																							
		Mixtures of named and improved																							
123	Arg.	CORDOVA and nf/40s shn, scd	1,214	10.5	-	-	1.1	11.4	21.2	19.9	16.0	11.0	9.2	6.0	1.0	1.5	0.5	0.5	-	-	0.1	0.2	0.1	0.1	0.2
355	Arg.	CORDOVA and nf/40s gr, shn	1,220	9.2	1.6	-	1.2	13.4	17.4	19.4	17.8	11.2	8.2	5.3	2.4	1.4	.7	.6	0.1	-	.3	-	.3	.1	.2
481	Arg.	CORDOVA and nf/40s gr, shn	1,209	6.3	-	-	1.0	13.2	20.5	19.4	15.3	11.7	7.4	6.4	1.7	.8	.8	.7	-	0.3	.2	.2	-	.2	.2
150	Scot.	SCOTCH BLACKFACE and nf/40s gr, flcs	1,223	31.2	2.1	-	1.7	5.4	14.1	19.4	17.8	13.9	11.6	9.1	1.7	1.6	1.0	.9	-	.2	-	.8	-	.3	.5
120	Italy	SARDINIAN and nf/40s gr, pul	1,224	11.7	7.3	-	4.8	15.9	18.9	14.1	10.7	6.4	4.2	7.8	1.7	2.6	1.3	4.3	-	.4	.3	.9	.1	.9	4.7
		Carpet blends																							
160	U.K.	LONDONSHIRE scd, shn, pul, wh	1,250	18.7	-	-	3.6	13.4	17.0	13.4	13.0	13.4	9.6	8.2	2.7	1.6	1.0	1.5	-	.1	.1	.2	.2	.4	.6
420	U.K.	ENGLISH gr, shn, wh	1,230	12.8	4.2	0.1	3.5	15.0	19.6	19.9	13.4	11.6	6.0	4.0	1.9	.6	.8	.6	.3	.5	.3	.2	.2	.2	1.3
442	U.K.	WELSH gr, pul	1,252	8.0	2.4	-	.8	8.9	18.4	22.7	16.9	12.9	8.3	4.7	1.4	1.1	1.4	.8	.2	-	.2	.2	.3	.2	.6
441	U.K.	ENGLISH CROSSBRED 3/ gr, shn	1,239	27.0	2.8	-	.8	5.3	10.1	16.4	14.4	16.2	12.8	11.1	4.1	3.4	1.4	1.5	.3	.5	.1	.6	-	.2	.8
232	Neth.	HOLLAND scd, shn, wh	1,207	8.3	2.6	-	6.5	13.3	17.8	19.0	15.8	10.5	7.4	5.3	.7	.3	.6	.7	-	.3	.3	.3	.1	.2	.9
242	Neth.	HOLLAND scd, shn, wh	1,223	6.2	3.1	-	12.8	17.0	16.7	18.4	9.9	10.4	5.9	2.6	1.1	.5	.4	.6	.3	-	.7	-	.2	.1	2.4
412	Neth.	HOLLAND scd, shn, pul, wh	1,208	6.9	3.3	-	5.5	16.5	17.2	19.8	13.4	10.6	6.5	3.6	.7	1.7	.7	.8	-	.3	-	.8	-	.6	1.3
422	Neth.	HOLLAND scd, shn, pul, wh	1,211	5.1	3.0	-	7.1	15.3	20.3	18.0	13.5	9.5	5.5	4.7	1.2	1.1	.5	.6	-	.5	-	.4	-	.2	1.6
		IMPROVED																							
		Not finer than 40s																							
331	N.Z.	FELT flcs, fe	1,238	7.1	-	-	.4	1.5	7.1	13.0	18.5	21.0	20.3	11.1	3.4	2.3	1.2	.1	-	.1	-	-	-	-	-
351	N.Z.	FELT flcs, fe	1,373	6.8	-	-	.1	2.6	8.2	12.5	20.5	19.8	17.0	12.7	3.7	1.9	.6	.4	-	-	-	-	-	-	-
371	N.Z.	FELT flcs, fe	1,275	6.9	-	-	.1	.8	7.5	13.3	19.4	20.4	19.4	11.9	3.4	2.8	.9	.1	-	-	-	-	-	-	-
261	N.Z.	SOFT COTTED flcs, fe	1,238	3.6	-	-	.1	4.1	11.5	19.9	22.7	17.1	13.6	8.2	1.7	.7	.2	.2	-	-	-	-	-	-	-
105	N.Z.	"B" style, es flcs	1,226	5.8	-	-	.2	2.6	9.2	16.3	24.5	22.0	14.9	7.8	.9	.9	.4	.2	-	-	-	-	-	-	-
340	N.Z.	"B" style, fe flcs	1,215	7.9	-	-	.3	1.2	6.9	13.2	18.9	20.5	18.8	14.7	2.8	1.6	.8	.3	-	-	-	-	-	-	-
330	N.Z.	EARLY SHORN flcs	1,253	3.2	-	-	.2	3.6	9.0	14.2	16.7	22.2	17.4	11.3	2.6	1.2	1.1	.4	.1	-	-	-	-	-	-
115	N.Z.	2d SHEAR gr, shn	1,211	10.7	-	-	.1	2.6	8.6	17.6	17.3	21.8	15.8	11.6	2.4	1.7	.3	.2	-	-	-	-	-	-	-
335	N.Z.	2d SHEAR gr, shn	1,355	6.0	-	-	.2	3.2	11.4	17.7	20.2	19.6	13.6	8.9	2.7	1.7	.3	.4	.1	-	-	-	-	-	-
135	N.Z.	PULLED gr, fe	1,240	10.0	-	-	.1	2.3	7.1	17.1	20.9	23.3	16.7	9.8	1.2	1.1	.2	.2	-	-	-	-	-	-	-
101	N.Z.	CRUTCHINGS gr, shn	1,242	20.6	-	-	.1	1.0	6.8	15.1	20.1	19.1	15.8	15.2	2.4	2.2	1.1	.9	-	-	-	-	.1	-	.1
145	N.Z.	CRUTCHINGS gr, shn	1,211	17.6	-	-	-	2.4	8.8	16.5	18.2	20.2	16.8	12.5	1.8	1.4	.6	.5	-	-	-	-	.1	-	.2
162	N.Z.	CRUTCHINGS gr, shn	1,216	16.3	-	-	.2	2.2	8.8	17.4	20.8	18.3	13.7	13.2	1.8	2.6	.4	.4	-	-	-	-	.1	-	.1
165	N.Z.	CRUTCHINGS gr, shn	1,222	15.1	-	-	-	1.2	6.9	13.3	24.7	21.9	15.8	11.9	2.0	1.5	.5	.2	-	-	-	-	.1	-	-
185	N.Z.	CRUTCHINGS gr, shn	1,210	11.7	-	-	-	2.6	8.0	15.8	17.7	21.2	16.2	11.4	3.4	1.6	1.9	.2	-	-	-	-	-	-	-
195	N.Z.	CRUTCHINGS gr, shn	1,226	10.0	-	-	.2	3.8	11.7	16.8	19.5	20.1	15.5	8.2	2.5	1.0	.3	.2	-	-	-	-	-	.1	.1
320	N.Z.	CRUTCHINGS gr, shn	1,266	16.4	-	-	-	3.3	11.1	14.5	17.5	16.4	14.7	12.3	3.9	3.2	2.0	.9	-	-	-	-	.1	-	.1
103	Arg.	BA 5/6s Nov, scd, shn	1,260	7.1	-	-	.2	4.4	10.5	15.9	20.2	19.5	14.6	10.4	1.8	1.7	.6	.1	-	-	-	-	.1	-	-
182	Arg.	BA 5/6s Nov, gr, shn	1,232	7.7	-	-	.1	5.2	12.4	15.0	21.7	18.7	14.9	8.3	1.7	1.5	.2	.2	-	-	-	-	-	-	.1
202	Arg.	BA 5/6s Nov, scd, shn	1,264	7.1	1.0	-	.4	5.1	11.4	15.0	18.0	18.7	17.3	7.9	3.5	1.5	.6	.6	-	-	-	-	-	-	-
212	Arg.	BA 5/6s Mar, gr, shn	1,224	7.7	-	-	.3	3.5	10.1	14.5	18.7	18.9	16.8	11.4	2.7	1.9	.7	.4	-	-	-	.1	-	-	-
222	Arg.	BA 5/6s Mar, scd, shn	1,304	3.4	-	-	.3	3.2	12.1	14.3	18.4	19.3	16.7	11.1	2.2	1.1	.9	.3	.1	-	-	-	-	-	-
491	Arg.	BA 5/6s Nov, gr, shn, long	1,310	3.1	-	-	.2	2.4	12.3	15.5	18.2	18.8	17.0	11.8	2.1	1.4	.6	-	-	-	-	-	-	-	-
231	Arg.	BA 5/6s pul, wsh	1,210	6.9	-	-	.2	2.8	10.1	13.3	22.0	21.2	16.3	10.7	1.7	1.0	.5	.2	-	-	-	-	-	-	-
370	Arg.	BA 5/6s gr, pul, fe	1,243	5.0	-	-	.2	4.8	11.5	15.4	18.0	19.3	15.5	11.4	1.8	1.6	.4	.1	-	-	-	-	-	-	-
400	Arg.	BA 5/6s gr, pul	1,210	4.8	-	-	.5	4.1	13.2	17.6	21.0	19.6	13.6	7.7	1.2	.9	.4	.2	-	-	-	-	-	-	-
172	Arg.	BA 5/6s gr, pul, 3/4 in	1,225	8.6	-	-	.3	3.8	13.5	17.8	18.9	20.1	14.4	7.8	2.0	.7	.4	.2	-	-	.1	-	-	-	-
470	Arg.	BA 5/6s gr, pul, 3/4 in	1,235	2.7	-	-	.3	5.7	12.5	20.8	18.2	18.3	14.9	6.6	2.0	.4	.1	.1	-	.1	-	-	-	-	-
192	Arg.	BA 5/6s shn, scd	1,222	7.4	1.0	-	.5	5.4	13.9	15.7	20.0	18.9	13.1	7.8	2.2	1.1	.5	.6	-	.1	-	-	.2	-	-
350	Arg.	BA 5/6s shn, scd, ce	1,244	5.9	-	-	.5	4.3	11.0	15.7	19.5	20.7	16.8	8.3	1.8	.8	.2	.3	-	-	-	-	.1	-	-
360	Arg.	BA 5/6s gr, shn, sup lb	1,221	20.3	1.2	-	1.5	10.7	18.3	20.8	17.0	13.5	9.8	5.6	1.3	.7	.3	.2	.1	-	-	-	.1	-	.1
113	Arg.	BA 5/6s scd, bur, shn	1,217	12.4	-	-	.6	6.5	14.0	19.3	21.4	16.6	11.6	6.8	1.8	1.0	.2	.2	-	-	-	-	-	-	-
305	W.Ger.	flcs	1,207	21.1	1.1	-	.3	3.7	10.1	17.9	15.8	17.9	15.7	12.8	2.9	1.6	.5	.6	-	-	-	-	.2	-	-
310	W.Ger.	flcs	1,236	21.2	1.0	-	1.0	4.4	9.6	16.0	22.4	17.9	12.7	9.6	2.6	2.2	.9	.4	-	.1	.1	-	.1	-	-
432	W.Ger.	Eider flcs, fe	1,261	16.0	-	-	.3	5.6	11.1	17.4	18.9	17.5	14.5	10.5	2.4	.9	.2	.1	.1	.2	-	.1	-	-	.2
315	Ire.	Wethers flcs, fe	1,232	18.1	-	-	.2	1.9	7.6	16.3	20.4	21.2	15.9	10.2	3.3	1.8	.5	.3	-	.1	-	-	.1	.1	.1
223	Ire.	Wethers felt flcs, fe, slt	1,211	13.0	-	-	.5	3.2	9.7	15.0	18.1	21.6	16.0	11.4	1.4	2.1	.5	.3	-	-	.1	-	-	.1	-
4/ 280	Ire.	Crossbred gr, shn	1,214	22.0	-	-	.2	1.5	6.3	12.7	19.0	23.0	18.6	12.7	1.8	2.7	.9	.6	-	-	-	-	-	-	-
472	Ire.	Crossbred flcs, fe	1,246	22.6	1.0	-	.7	5.5	13.6	16.5	20.3	18.9	11.9	8.2	1.6	1.8	.6	.1	.1	-	.1	.1	-	-	-
220	U.K.	DEVON sc	1,218	42.0	4.8	.5	4.6	12.5	14.2	18.0	16.6	13.4	10.6	4.6	3.2	.9	.3	.2	.2	.1	.1	-	-	-	-
262	U.K.	DEVON flcs	1,270	23.1	1.6	-	-	1.4	4.2	9.2	16.3	19.1	18.6	15.9	5.6	3.9	2.3	2.1	.4	.5	-	-	-	.2	.3
312	Uru.	cb flcs, low mixed quality	1,208	4.6	-	-	-	2.2	8.7	14.4	18.9	21.6	19.1	11.8	2.2	.9	.1	.1	-	-	-	-	-	-	-
322	Uru.	cb flcs, low mixed quality	1,209	5.2	-	-	.1	2.6	10.6	19.3	22.5	22.3	14.3	6.4	1.3	.3	.2	.1	-	-	-	-	-	-	-

See footnotes at end of table.

Table 4.—**Results of micron analysis of 146 samples** of wool: Laboratory C--Continued

Sample No.	Origin	Description and customs (visual) classification 1/	Total fibers counted	Percent medullated fibers	Percent kemp fibers	Percentage of fibers in each micron cell																						
						5.00 to 9.99	10.00 to 14.99	15.00 to 19.99	20.00 to 24.99	25.00 to 29.99	30.00 to 34.99	35.00 to 39.99	40.00 to 44.99	45.00 to 49.99	50.00 to 54.99	55.00 to 59.99	60.00 to 64.99	65.00 to 69.99	70.00 to 74.99	75.00 to 79.99	80.00 to 84.99	85.00 to 89.99	90.00 to 94.99	95.00 to 99.99	100.00 and over
		IMPROVED--Continued																										
		Finer than 40s, not finer than 44s																										
301	N.Z.	FELT flcs, ce	1,325	6.3	-	-	0.1	1.5	6.6	15.8	21.7	20.9	18.4	10.5	2.9	1.0	0.4	0.2	--	--	--	--	--	--	-
341	N.Z.	FELT flcs, ce	1,202	7.7	-	-	-	1.8	7.1	15.3	21.0	22.6	17.6	11.2	2.2	.8	.3	.1	--	--	--	--	--	--	--	-
345	N.Z.	FELT flcs, ce	1,293	5.6	-	-	-	1.5	6.0	12.4	21.4	22.6	19.0	12.0	2.9	1.5	.5	.2	--	--	--	--	--	--	--	-
361	N.Z.	FELT flcs, ce	1,239	6.5	-	-	.1	2.4	8.0	17.2	20.2	18.4	16.1	12.8	2.3	1.6	.6	.3	--	--	--	--	--	--	--	-
321	N.Z.	FELT flcs, ce	1,207	5.9	-	-	.1	1.2	7.0	14.5	20.2	25.1	15.6	11.8	3.0	1.2	.3	--	--	--	--	--	--	--	--	-
213	N.Z.	FELT gr, pul, fe	1,205	5.6	-	-	.1	1.9	9.3	16.8	20.6	20.1	16.6	12.0	1.1	.9	.5	--	--	--	--	--	--	--	--	-
253	N.Z.	"B" flcs, fe	1,216	6.8	-	-	.1	2.2	9.2	14.5	21.0	21.3	17.7	10.2	1.9	1.4	.4	.1	--	--	--	--	--	--	--	-
190	N.Z.	"B" flcs, ce	1,214	4.4	-	-	.9	7.2	12.1	17.5	24.5	19.9	12.3	4.4	.8	.3	--	.1	--	--	--	--	--	--	--	-
325	N.Z.	EARLY SHORN flcs	1,296	9.6	-	-	.1	1.2	8.1	15.0	21.9	17.5	16.9	12.0	3.5	2.1	1.2	.1	0.3	0.1	--	--	--	--	--	-
161	N.Z.	2d SHEAR gr, shn	1,238	10.5	-	0.1	.1	1.1	6.9	14.6	22.3	18.7	17.5	13.6	2.1	1.4	.7	.8	--	--	--	--	--	--	--	0.1
102	N.Z.	CRUTCHINGS gr, shn	1,225	12.7	-	-	.2	2.1	6.9	12.1	22.9	20.4	15.3	14.0	2.5	1.5	.8	1.2	.1	--	--	--	--	--	--	-
112	N.Z.	CRUTCHINGS gr, shn	1,225	16.8	-	-	.2	2.0	7.8	13.0	16.0	19.1	19.6	15.6	2.6	2.8	.8	.4	--	.1	--	--	--	--	--	-
191	N.Z.	CRUTCHINGS gr, shn	1,234	18.3	-	-	.1	3.9	7.0	10.5	17.1	18.7	15.8	16.0	7.9	1.5	.7	.6	.2	--	--	--	--	--	--	-
121	N.Z.	CRUTCHINGS blend, gr, shn	1,214	14.2	-	-	.4	3.4	12.0	19.0	20.9	17.4	13.7	9.0	1.6	1.6	.4	.5	--	--	--	--	--	--	--	.1
131	N.Z.	CRUTCHINGS blend, gr, shn	1,227	12.8	-	-	.2	2.0	12.1	23.7	18.8	18.4	14.0	7.8	1.3	1.5	.1	.1	--	--	--	--	--	--	--	-
141	N.Z.	CRUTCHINGS blend, gr, shn	1,231	12.9	-	-	.2	3.4	9.6	18.3	20.2	18.6	14.3	11.2	1.1	2.0	.5	.2	--	--	--	--	--	--	0.2	.2
271	N.Z.	DAG scd, shn	1,206	13.4	-	-	.5	4.4	13.7	20.8	21.1	15.0	12.0	8.8	1.5	1.1	.8	.3	--	--	--	--	--	--	--	-
203	Ire.	FELT wethers, flcs, sup, slt, ce	1,209	28.9	-	-	.1	1.7	8.3	12.1	21.4	18.6	17.3	14.0	2.9	2.1	.9	.5	--	.1	--	--	--	--	--	-
292	Ire.	FELT wethers, flcs, sup, slt, fe	1,210	29.7	-	-	.4	3.6	9.4	14.4	18.8	18.5	16.9	12.3	3.1	1.6	.6	.3	--	--	--	--	0.1	--	--	-
233	Austl	"B" flcs	1,228	7.2	-	-	.4	3.4	9.3	18.7	23.3	20.0	15.1	7.0	1.8	.9	.1	--	--	--	--	--	--	--	--	-
365	Uru.	MONTE CRIOLLA gr, shn	1,228	18.7	-	-	1.6	10.0	15.9	21.7	18.3	16.2	7.9	5.4	1.6	.7	.3	.3	.1	--	--	--	--	--	--	-
		Finer than 44s, not finer than 46s																										
302	N.Z.	FELT gr, pul	1,220	21.3	-	-	.3	4.3	13.9	20.4	22.5	16.7	13.6	7.2	.8	.2	.1	--	--	--	--	--	--	--	--	-
311	N.Z.	FELT gr, pul	1,212	17.6	-	-	.3	5.3	17.9	21.1	19.0	17.4	11.3	5.3	1.1	1.0	.2	--	--	--	--	--	--	--	--	-
381	N.Z.	FELT gr, pul	1,209	20.3	-	-	.3	3.1	13.2	18.4	22.1	19.9	13.2	8.5	.8	.3	.1	.1	--	--	--	--	--	--	--	-
391	N.Z.	FELT gr, pul	1,211	20.0	-	-	.2	4.0	15.4	19.9	20.5	16.6	13.8	7.6	1.4	.4	.2	--	--	--	--	--	--	--	--	-
142	N.Z.	"B" flcs, fe	1,227	7.6	-	-	.2	2.8	9.1	16.1	24.1	21.9	15.0	8.3	1.2	1.1	.2	--	--	--	--	--	--	--	--	-
243	N.Z.	"C" flcs, ce	1,212	5.8	-	-	.5	2.3	9.2	17.6	20.4	19.7	17.1	10.0	1.1	1.6	.3	.1	--	--	--	.1	--	--	--	-
171	N.Z.	2d SHEAR gr, shn	1,221	8.4	-	-	.4	3.8	12.4	17.9	21.0	20.3	12.1	8.9	1.7	.9	.3	.2	--	--	--	--	--	--	--	-
152	N.Z.	CRUTCHINGS gr, shn	1,226	15.6	-	-	.1	1.7	10.0	16.1	23.7	21.6	16.7	7.7	1.1	.7	.4	.2	--	--	--	--	--	--	.1	-
		Finer than 46s																										
181	N.Z.	"B" flcs	1,228	7.2	-	-	.5	4.1	11.6	19.6	25.2	17.5	12.5	6.4	1.1	1.1	.2	.2	--	--	--	--	--	--	--	-
122	N.Z.	2d SHEAR gr, shn	1,223	9.6	-	-	.3	5.3	14.2	19.7	20.7	17.6	12.6	7.3	.9	.9	.3	.2	--	--	--	--	--	--	--	-
132	N.Z.	2d SHEAR gr, shn	1,229	10.7	-	-	.1	3.1	12.9	21.0	22.7	19.1	12.7	6.8	.6	.9	--	.1	--	--	--	--	--	--	--	-
151	N.Z.	2d SHEAR gr, shn	1,242	11.0	-	-	.4	5.0	14.5	19.4	20.6	18.0	12.4	7.9	1.0	.6	--	.2	--	--	--	--	--	--	--	-
		Composite grades (bales mixed)																										
111	N.Z.	44s-46s 2d sh, gr, shn	1,250	7.0	-	-	.2	1.7	8.2	16.2	24.0	21.0	15.7	9.0	1.5	1.5	.4	.4	--	--	0.1	.1	--	--	-
125	N.Z.	nf/40s-44s-46s gr, pul	1,225	6.7	-	-	-	1.1	7.7	14.5	22.6	21.5	17.6	10.7	2.2	1.1	.7	.3	--	--	--	--	--	--	--	-
155	N.Z.	nf/40s-44s-46s 2d sh, gr, shn	1,238	9.4	-	-	.2	1.5	10.6	17.7	20.3	20.0	17.6	9.5	.7	1.4	.2	.1	--	.1	--	--	--	--	--	.1
175	N.Z.	nf/40s-44s-46s 2d sh, gr, shn	1,220	10.1	-	-	.4	2.4	8.7	16.9	21.6	21.1	17.1	7.3	2.8	1.2	.1	.3	--	--	.1	--	--	--	--	-

1/ Designations: bur, burry; cb, combing; ce, toward coarse edge of customs grade; clp, clipped; clr, colored; es, early shorn; fe, toward fine edge of customs grade; felt, papermakers' felt type; flcs, fleeces; fn, fawn; gr, greasy; gry, gray; in, inches in length of fiber; kpy, kempy; lb, lambs (wool); lt, light; mach, machined; Mar, shorn in March; md, moth damage; nf/40s, not finer than 40s; Nov, shorn in November; pcs, pieces; pul, pulled; scd, scoured; 2d sh, second shear; shn, shorn; slt, selected; srt, sorted; sup, super; wh, white; wsh, washed; yel, yellow; 44s, finer than 40s and not finer than 44s; 46s, finer than 44s and not finer than 46s.

2/ Washed with water after shearing or pulling and consequently considered scoured by customs.

3/ Complaint filed by buyer that this lot was merely a mixed lot and not the standard English blend.

4/ Sample No. 280 was originally classified as an Irish Blackface by mistake; the wool was reexamined and regraded after it was discovered that this classification was out of line with its micron grade and with the hand sample that was taken.

Table 5A.--Unimproved wools: Average fiber diameter, standard deviation and coefficient of variation computed from micron tests performed by laboratory A

(Arranged in descending order of coefficient of variation)

Sample No.	Description	Average fiber diameter	Standard deviation	Coefficient of variation	Sample No.	Description	Average fiber diameter	Standard deviation	Coefficient of variation
		Microns	Microns	Percent			Microns	Microns	Percent
440	Mongolian	26.41	17.99	68.1	461	Iranian	33.63	15.18	45.1
462	Mongolian	24.73	15.49	62.6	230	Iranian	35.04	15.81	45.1
183	Mongolian	25.16	15.54	61.8	250	Scotch Blackface	36.36	16.38	45.0
120	Sardinian and 40s mixture	33.68	19.69	58.5	211	Aleppo	31.68	14.14	44.6
110	Sardinian	32.54	18.82	57.8	482	Welsh Mountain	32.96	14.62	44.4
143	Cyprus	34.50	18.42	53.4	471	Iranian	37.90	16.80	44.3
412	Holland blend	30.53	15.85	51.9	480	Aleppo	31.34	13.88	44.3
421	Kandahar	28.74	14.86	51.7	252	Montgomery	31.35	13.79	44.0
133	Cyprus	33.97	17.41	51.3	450	Iranian	37.93	16.67	43.9
130	Scotch Blackface	38.80	19.73	50.9	270	Awassi	30.03	13.15	43.8
100	Sardinian	36.18	18.23	50.4	452	Montgomery	37.70	16.35	43.4
395	Aleppo	34.41	16.97	49.3	490	Montgomery	36.69	15.85	43.2
180	Khorrassan	31.64	15.50	49.0	221	Aleppo	32.88	14.16	43.1
232	Holland blend	30.95	15.10	48.8	140	Scotch Blackface	35.26	15.12	42.9
430	Khorrassan	30.20	14.72	48.7	290	Awassi	31.98	13.64	42.7
200	East Indian	31.72	15.45	48.7	240	Vicanere	36.25	15.07	41.6
251	Iranian	35.66	17.35	48.6	210	Awassi	30.47	12.62	41.4
291	Karakul	30.78	14.95	48.6	375	Haslock	36.90	15.14	41.0
201	Pakistan	28.11	13.65	48.6	420	English blend	32.67	13.14	40.2
272	Blackface	32.30	15.31	47.4	460	Bicanere	33.95	13.63	40.2
380	Karakul	30.70	14.52	47.3	281	Zackel	38.82	15.54	40.0
153	Cyprus	31.67	14.94	47.2	402	Bicanere	33.30	12.97	38.9
422	Holland blend	32.19	15.15	47.1	163	Welsh Mountain	32.05	12.48	38.9
385	Aleppo	35.95	16.86	46.9	241	Cordova	30.90	11.98	38.8
451	Scotch Blackface	37.47	17.35	46.3	410	Bicanere	34.88	13.26	38.0
411	Kandahar	30.68	14.22	46.3	123	Cordova and nf/40s mixture	31.34	11.85	37.8
390	Aleppo	33.66	15.55	46.2	442	Welsh blend	32.75	12.25	37.4
401	Montgomery	31.11	14.25	45.8	173	Welsh Mountain	33.67	12.52	37.2
260	Awassi	31.83	14.49	45.5	170	Joria	39.50	14.39	36.4
242	Holland blend	29.86	13.56	45.4	150	Scotch Blackface and 40s mixture	35.65	12.70	35.6
282	Iranian	36.49	16.52	45.3	481	Cordova and nf/40s mixture	30.77	10.91	35.5
160	Londonshire blend	33.66	15.22	45.2	441	English crossbred blend	40.58	14.26	35.1
492	East Indian	37.29	16.84	45.2	355	Cordova and nf/40s mixture	31.11	10.81	34.7

Table 5B.--Unimproved wools: Average fiber diameter, standard deviation and coefficent of variation computed from micron tests performed by laboratory B

(Arranged in descending order of coefficient of variation)

Sample No.	Description	Average fiber diameter	Standard deviation	Coefficient of variation	Sample No.	Description	Average fiber diameter	Standard deviation	Coefficient of variation
		Microns	Microns	Percent			Microns	Microns	Percent
462	Mongolian	25.08	16.50	65.8	183	Mongolian	20.06	8.73	43.5
120	Sardinian and 40s mixture	34.61	20.68	59.8	395	Aleppo	31.57	13.73	43.5
110	Sardinian	31.37	17.76	56.6	201	Pakistan	26.74	11.50	43.0
200	East Indian	31.58	17.58	55.7	211	Aleppo	30.61	13.16	43.0
250	Scotch Blackface	37.34	19.93	53.4	242	Holland blend	32.12	13.75	42.8
401	Montgomery	32.32	16.97	52.5	380	Karakul	29.22	12.44	42.6
140	Scotch Blackface	34.61	17.85	51.6	281	Zackel	39.50	16.76	42.4
440	Mongolian	21.50	11.05	51.4	241	Cordova	31.97	13.41	42.0
451	Scotch Blackface	37.40	19.14	51.2	282	Iranian	34.64	14.43	41.7
232	Holland blend	29.36	14.95	50.9	385	Aleppo	32.45	13.44	41.4
143	Cyprus	31.98	16.19	50.6	482	Welsh Mountain	31.12	12.86	41.3
252	Montgomery	32.54	16.38	50.3	210	Awassi	30.79	12.60	40.9
251	Iranian	35.60	17.34	48.7	180	Khorrassan	28.97	11.86	40.9
480	Aleppo	31.63	15.12	47.8	230	Iranian	31.92	12.93	40.5
421	Kandahar	30.66	14.60	47.6	150	Scotch Blackface and 40s mixture	35.10	14.16	40.3
160	Londonshire blend	32.18	15.32	47.6	272	Blackface	29.71	11.91	40.1
153	Cyprus	31.52	14.73	46.7	390	Aleppo	31.18	12.42	39.8
270	Awassi	28.07	12.90	46.0	130	Scotch Blackface	32.47	12.54	38.6
411	Kandahar	31.62	14.52	45.9	402	Bicanere	34.19	13.19	38.6
260	Awassi	34.03	15.56	45.7	163	Welsh Mountain	30.04	11.39	37.9
133	Cyprus	30.51	13.83	45.3	123	Cordova and nf/40s mixture	30.16	10.88	36.1
461	Iranian	34.14	15.48	45.3	410	Bicanere	35.12	12.60	35.9
100	Sardinian	32.56	14.71	45.2	173	Welsh Mountain	31.72	11.33	35.7
420	English blend	33.67	15.14	45.0	481	Cordova and nf/40s mixture	29.89	10.42	34.9
291	Karakul	31.28	14.03	44.9	240	Vicanere	32.58	11.26	34.6
290	Awassi	31.46	13.89	44.1	375	Haslock	33.56	11.49	34.2
221	Aleppo	32.22	14.21	44.1	170	Joria	36.15	12.35	34.2
450	Iranian	39.29	17.19	43.8	355	Cordova and nf/40s mixture	30.09	9.95	33.1

Note.--The following samples were not analyzed by laboratory B: 412, 422, 430, 441, 442, 452, 460, 471, 490, 492.

Table 5C.--Unimproved wools: Average fiber diameter, standard deviation and coefficient of variation computed from micron tests performed by laboratory C

(Arranged in descending order of coefficient of variation)

Sample No.	Description	Average fiber diameter	Standard deviation	Coefficient of variation	Sample No.	Description	Average fiber diameter	Standard deviation	Coefficient of variation
		Microns	Microns	Percent			Microns	Microns	Percent
183	Mongolian	29.77	27.75	93.2	170	Joria	38.48	19.34	50.3
440	Mongolian	28.61	26.45	92.4	201	Pakistan	28.36	14.22	50.1
462	Mongolian	27.81	23.07	83.0	230	Iranian	35.48	17.59	49.6
130	Scotch Blackface	41.12	30.41	74.0	232	Holland blend	30.73	15.18	49.4
120	Sardinian and 40s mixture	37.32	26.49	71.0	210	Awassi	31.26	15.36	49.1
482	Welsh Mountain	32.93	23.34	70.9	452	Montgomery	35.78	17.57	49.1
110	Sardinian	32.60	22.36	68.6	490	Montgomery	36.98	18.12	49.0
451	Scotch Blackface	35.91	23.43	65.2	160	Londonshire blend	33.36	16.28	48.8
140	Scotch Blackface	37.45	24.27	64.8	385	Aleppo	35.03	16.90	48.2
200	East Indian	32.92	21.19	64.4	450	Iranian	36.62	17.52	47.8
242	Holland blend	29.68	18.89	63.6	211	Aleppo	33.14	15.44	46.6
272	Blackface	34.25	21.66	63.2	221	Aleppo	32.50	14.88	45.8
180	Khorrassan	34.07	21.39	62.8	291	Karakul	31.55	14.45	45.8
133	Cyprus	33.82	21.06	62.3	480	Aleppo	32.78	15.01	45.8
143	Cyprus	34.39	20.38	59.3	240	Vicanere	35.62	16.23	45.6
250	Scotch Blackface	38.11	22.58	59.2	260	Awassi	31.65	14.22	44.9
411	Kandahar	31.52	18.05	57.3	390	Aleppo	32.39	14.45	44.6
430	Khorrassan	29.83	16.92	56.7	380	Karakul	31.28	13.86	44.3
492	East Indian	35.48	19.84	55.9	290	Awassi	31.91	14.13	44.3
100	Sardinian	36.72	20.48	55.8	460	Bicanere	31.86	14.00	43.9
395	Aleppo	37.26	20.43	54.8	270	Awassi	29.63	12.93	43.6
422	Holland blend	30.35	16.45	54.2	410	Bicanere	33.23	14.48	43.6
401	Montgomery	30.31	16.35	53.9	173	Welsh Mountain	33.57	14.61	43.5
421	Kandahar	28.80	15.27	53.0	281	Zackel	38.82	16.34	42.1
375	Haslock	36.74	19.29	52.5	442	Welsh blend	32.56	13.70	42.1
252	Montgomery	31.82	16.66	52.4	461	Iranian	31.49	13.16	41.8
420	English blend	31.35	16.22	51.7	150	Scotch Blackface and 40s mixture	34.84	14.44	41.4
163	Welsh Mountain	32.40	16.62	51.3	355	Cordova and nf/40s mixture	31.60	12.87	40.7
153	Cyprus	31.22	16.02	51.3	402	Bicanere	33.57	13.50	40.2
471	Iranian	37.83	19.30	51.0	441	English crossbred blend	37.67	15.04	39.9
251	Iranian	35.69	18.15	50.9	241	Cordova	31.27	12.16	38.9
412	Holland blend	31.23	15.86	50.8	481	Cordova and nf/40s mixture	31.19	11.89	38.1
282	Iranian	37.04	18.67	50.4	123	Cordova and nf/40s mixture	31.05	11.25	36.2

Table 6A.--Improved wools: Average fiber diameter, standard deviation and coefficient of variation computed from micron tests performed by laboratory A

(Arranged in descending order of average fiber diameter and grouped on the basis of the proposed U.S. Department of Agriculture micron grades)

Sample No.	Description and customs (visual) classification 1/	Average fiber diameter	Standard deviation	Coefficient of variation
	40.21 microns and over (coarser than 36s)	Microns	Microns	Percent
262	UK Devon nf/40s	42.47	10.99	25.9
	38.10 to 40.20 microns (36s)			
280	Irish nf/40s	39.50	9.55	24.2
191	NZ crutchings 44s	39.46	10.42	26.4
112	NZ crutchings 44s	39.06	10.23	26.2
162	NZ crutchings nf/40s	38.35	10.29	26.8
102	NZ crutchings 44s	38.18	10.32	27.0
331	NZ felt nf/40s	38.10	9.33	24.5
	36.20 to 38.09 microns (40s)			
161	NZ 2d shear 44s	38.05	9.34	24.5
371	NZ felt nf/40s	38.04	8.93	23.5
351	NZ felt nf/40s	37.94	9.18	24.2
101	NZ crutchings nf/40s	37.89	10.60	28.0
203	Irish felt 44s	37.87	10.08	26.6
325	NZ early shorn 44s	37.83	9.80	25.9
345	NZ felt 44s	37.72	8.65	22.9
125	NZ nf/40s-44s-46s (mixed)	37.69	9.39	24.9
315	Irish nf/40s	37.67	9.72	25.8
220	UK Devon nf/40s	37.67	11.42	30.3
340	NZ "B" nf/40s	37.60	9.50	25.3
223	Irish 40s	37.56	10.07	26.8
341	NZ felt 44s	37.41	9.05	24.2
301	NZ felt 44s	37.33	8.63	23.1
185	NZ crutchings nf/40s	37.29	10.55	28.3
330	NZ early shorn nf/40s	37.19	9.02	24.3
111	NZ 44s-46s mixed	37.11	9.01	24.3
135	NZ pulled nf/40s	37.10	9.26	25.0
361	NZ felt 44s	37.09	9.36	25.2
213	NZ felt 44s	37.05	9.11	24.6
145	NZ crutchings nf/40s	37.00	10.40	28.1
321	NZ felt 44s	36.99	9.14	24.7
103	Arg BA 5/6s nf/40s	36.89	10.38	28.1
312	Uru nf/40s	36.88	9.10	24.7
165	NZ crutchings nf/40s	36.86	8.69	23.6
195	NZ crutchings nf/40s	36.77	9.35	25.4
292	Irish felt 44s	36.74	10.26	27.9
432	W Germ nf/40s	36.72	10.71	29.2
152	NZ crutchings 46s	36.69	8.87	24.2
320	NZ crutchings nf/40s	36.60	11.09	30.3
115	NZ 2d shear nf/40s	36.49	10.03	27.5
253	NZ "B" 44s	36.37	9.17	25.2
305	W Germ nf/40s	36.36	10.98	30.2
310	W Germ nf/40s	36.31	10.87	29.9
142	NZ "B" 46s	36.23	9.21	25.4
222	Arg BA 5/6s nf/40s	36.20	9.96	27.5
472	Irish nf/40s	36.12	10.89	30.1
	34.40 to 36.19 microns (44s)			
233	Austl "B" 44s	36.03	8.85	24.6
212	Arg BA 5/6s nf/40s	35.97	9.85	27.4
105	NZ "B" nf/40s	35.90	9.33	26.0
171	NZ 2d shear 46s	35.81	9.38	26.2
491	Arg BA 5/6s nf/40s	35.79	9.90	27.7
121	NZ crutchings blend 44s	35.77	10.08	28.2
350	Arg BA 5/6s nf/40s	35.76	9.90	27.7
231	Arg BA 5/6s nf/40s	35.70	9.93	27.8
370	Arg BA 5/6s nf/40s	35.66	9.82	27.5
182	Arg BA 5/6s nf/40s	35.64	9.68	27.2
131	NZ crutchings blend 44s	35.48	10.02	28.2
141	NZ crutchings blend 44s	35.30	10.40	29.5
155	NZ nf/40s-44s-46s (mixed)	35.26	9.29	26.4
175	NZ nf/40s-44s-46s (mixed)	35.25	8.92	25.3
243	NZ "C" 46s	35.11	9.48	27.0
202	Arg BA 5/6s nf/40s	35.05	9.78	27.9
400	Arg BA 5/6s nf/40s	34.94	9.82	28.1
470	Arg BA 5/6s nf/40s	34.82	9.63	27.7
261	NZ soft cotted nf/40s	34.76	9.10	26.2
172	Arg BA 5/6s nf/40s	34.65	9.38	27.1
132	NZ 2d shear nf/40s	34.53	9.10	26.4
271	NZ Dag 44s	34.52	9.70	28.1
	32.70 to 34.39 microns (46s)			
192	Arg BA 5/6s nf/40s	34.25	10.25	29.9
122	NZ 2d shear f/46s	34.12	9.25	27.1
335	NZ 2d shear nf/40s	34.01	9.36	27.5
181	NZ "B" f/46s	34.00	9.25	27.2
113	Arg BA 5/6s nf/40s	33.89	9.14	27.0
322	Uru nf/40s	33.66	8.19	24.3
190	NZ "B" 44s	33.65	9.16	27.2
151	NZ 2d shear f/46s	33.34	9.00	27.0
391	NZ felt 46s	33.24	8.68	26.1
302	NZ felt 46s	33.19	9.39	28.3
311	NZ felt 46s	33.01	8.78	26.6
381	NZ felt 46s	32.94	9.36	28.4
	31.00 to 32.69 microns (48s)			
365	Uru Monte Criolla 44s	32.42	10.35	31.9
360	Arg BA 5/6s nf/40s	31.71	9.95	31.4

1/ Assigned by the U.S. Bureau of Customs. The term "nf/40s" is used to denote all wools not finer than 40s. The term "44s" is used to denote wools finer than 40s, but not finer than 44s. The term "46s" is used to denote wools finer than 44s, but not finer than 46s. The term "f/46s" is used to denote all wools finer than 46s.

Table 6B.--Improved wools: Average fiber diameter, standard deviation and coefficient of variation computed from micron tests performed by laboratory B

(Arranged in descending order of average fiber diameter and grouped on the basis of the proposed U.S. Department of Agriculture micron grades)

Sample No.	Description and customs (visual) classification 1/	Average fiber diameter	Standard deviation	Coefficient of variation
	40.21 microns and over (coarser than 36s)	Microns	Microns	Percent
262	UK Devon nf/40s	43.10	11.01	25.5
	38.10 to 40.20 microns (36s)			
191	NZ crutchings 44s	39.74	11.48	28.9
102	NZ crutchings 44s	39.46	10.43	26.4
112	NZ crutchings 44s	39.35	11.31	28.7
161	NZ 2d shear 44s	38.28	9.68	25.3
	36.20 to 38.09 microns (40s)			
351	NZ felt nf/40s	37.80	9.14	24.2
165	NZ crutchings nf/40s	37.79	9.32	24.7
195	NZ crutchings nf/40s	37.40	10.10	27.0
203	Irish felt 44s	37.35	9.99	26.8
371	NZ felt nf/40s	37.33	8.60	23.0
115	NZ 2d shear nf/40s	37.22	9.59	25.8
220	UK Devon nf/40s	37.22	11.73	31.5
162	NZ crutchings nf/40s	37.16	10.60	28.5
105	NZ "B" nf/40s	37.06	9.37	25.3
223	Irish nf/40s	37.06	9.98	26.9
253	NZ "B" 44s	37.02	9.15	24.7
340	NZ "B" nf/40s	36.96	9.24	25.0
213	NZ felt 44s	36.81	9.33	25.4
301	NZ felt 44s	36.78	9.04	24.6
135	NZ pulled nf/40s	36.77	9.36	25.5
341	NZ felt 44s	36.72	8.44	23.0
331	NZ felt nf/40s	36.70	8.98	24.5
280	Irish nf/40s	36.64	10.11	27.6
101	NZ crutchings nf/40s	36.61	10.03	27.4
361	NZ felt 44s	36.59	9.13	25.0
312	Uru nf/40s	36.55	9.74	26.6
103	Arg BA 5/6s nf/40s	36.38	10.15	27.9
345	NZ felt 44s	36.36	8.98	24.7
243	NZ "C" 46s	36.33	9.42	25.9
321	NZ felt 44s	36.30	8.84	24.4
432	W Germ nf/40s	36.26	9.75	26.9
	34.40 to 36.19 microns (44s)			
472	Irish nf/40s	36.09	10.57	29.3
315	Irish nf/40s	35.92	8.76	24.4
325	NZ early shorn 44s	35.88	9.42	26.3
171	NZ 2d shear 46s	35.88	9.50	26.5
233	Austl "B" 44s	35.58	9.70	27.3
320	NZ crutchings nf/40s	35.50	10.65	30.0
330	NZ early shorn nf/40s	35.48	8.94	25.2
350	Arg BA 5/6s nf/40s	35.43	9.51	26.8
152	NZ crutchings 46s	35.37	8.86	25.0
292	Irish felt 44s	35.22	10.15	28.8
370	Arg BA 5/6s nf/40s	35.18	9.86	28.0
222	Arg BA 5/6s nf/40s	35.12	9.50	27.0
172	Arg BA 5/6s nf/40s	34.84	10.72	30.8
121	NZ crutchings blend 44s	34.62	9.73	28.1
305	W Germ nf/40s	34.52	10.61	30.7
141	NZ crutchings blend 44s	34.46	10.23	29.7
	32.70 to 34.39 microns (46s)			
151	NZ 2d shear f/46s	34.18	9.27	27.1
261	NZ soft cotted nf/40s	34.10	9.52	27.9
310	W Germ nf/40s	34.00	10.16	29.9
335	NZ 2d shear nf/40s	33.97	9.64	28.4
322	Uru nf/40s	33.96	8.19	24.1
142	NZ "B" 46s	33.96	9.00	26.5
271	NZ Dag 44s	33.77	10.06	29.8
190	NZ "B" 44s	33.76	9.41	27.8
302	NZ felt 46s	33.68	9.70	28.8
122	NZ 2d shear f/46s	33.56	9.16	27.3
132	NZ 2d shear f/46s	33.52	9.08	27.1
181	NZ "B" f/46s	33.30	8.83	26.5
381	NZ felt 46s	33.28	8.83	26.5
113	Arg BA 5/6s nf/40s	33.08	10.42	31.5
	31.00 to 32.69 microns (48s)			
391	NZ felt 46s	32.21	8.48	26.3
365	Uru Monte Criolla 44s	31.48	9.68	30.7
311	NZ felt 46s	31.48	8.36	26.6
	29.30 to 30.99 microns (50s)			
360	Arg BA 5/6s nf/40s	30.54	9.35	30.6

1/ Visual grade assigned by the U.S. Bureau of Customs. The term "nf/40s" is used to denote all wools not finer than 40s. The term "44s" is used to denote wools finer than 40s, but not finer than 44s. The term "46s" is used to denote wools finer than 44s, but not finer than 46s. The term "f/46s" is used to denote all wools finer than 46s.

Note.--The following samples were not analyzed by laboratory B: 111, 125, 131, 145, 155, 175, 182, 185, 192, 202, 212, 231, 400, 470, 491.

Table 6C.--Improved wools: Average fiber diameter, standard deviation and coefficient of variation computed from micron tests performed by laboratory C

(Arranged in descending order of average fiber diameter and grouped on the basis of the proposed U.S. Department of Agriculture micron grades)

Sample No.	Description and customs (visual) classification 1/	Average fiber diameter	Standard deviation	Coefficient of variation
	40.21 microns and over (coarser than 36s)	Microns	Microns	Percent
262	UK Devon nf/40s	40.81	11.38	27.9
	36.20 to 38.09 microns (40s)			
191	NZ crutchings 44s	38.06	10.12	26.6
112	NZ crutchings 44s	37.64	9.55	25.4
101	NZ crutchings nf/40s	37.48	9.70	25.9
280	Irish nf/40s	37.43	9.04	24.2
371	NZ felt nf/40s	37.37	8.97	24.0
340	NZ "B" nf/40s	37.35	8.90	23.8
331	NZ felt nf/40s	37.25	9.20	24.7
203	Irish felt 44s	37.15	9.40	25.3
345	NZ felt 44s	37.11	8.48	22.8
102	NZ crutchings 44s	37.10	9.45	25.5
161	NZ 2d shear 44s	36.94	9.21	24.9
320	NZ crutchings nf/40s	36.93	11.10	30.1
325	NZ early shorn 44s	36.88	9.43	25.6
351	NZ felt nf/40s	36.76	9.29	25.3
185	NZ crutchings nf/40s	36.60	9.53	26.0
165	NZ crutchings nf/40s	36.45	8.50	23.3
321	NZ felt 44s	36.44	8.26	22.7
315	Irish nf/40s	36.33	9.54	26.3
125	NZ nf/40s-44s-46s (mixed)	36.32	8.50	23.4
301	NZ felt 44s	36.31	8.43	23.2
145	NZ crutchings nf/40s	36.25	9.70	26.8
	34.40 to 36.19 microns (44s)			
330	NZ early shorn nf/40s	36.18	9.51	26.3
361	NZ felt 44s	36.13	9.35	25.9
341	NZ felt 44s	36.08	8.25	22.9
292	Irish felt 44s	36.06	9.69	26.9
162	NZ crutchings nf/40s	36.06	9.72	27.0
312	Uru nf/40s	36.06	8.48	23.5
212	Arg BA 5/6s nf/40s	35.92	9.70	27.0
220	UK Devon nf/40s	35.84	10.94	30.5
305	W Germ nf/40s	35.83	10.12	28.2
115	NZ 2d shear nf/40s	35.82	8.99	25.1
253	NZ "B" 44s	35.75	8.64	24.2
223	Irish nf/40s	35.74	9.58	26.8
111	NZ 44s-46s (mixed)	35.58	8.79	24.7
135	NZ pulled nf/40s	35.49	8.20	23.1
231	Arg BA 5/6s nf/40s	35.48	8.77	24.7
213	NZ felt 44s	35.47	8.51	24.0
222	Arg BA 5/6s nf/40s	35.45	9.49	26.8
491	Arg BA 5/6s nf/40s	35.40	9.10	25.7
141	NZ crutchings blend 44s	35.29	9.94	28.2
243	NZ "C" 46s	35.25	8.87	25.2
175	NZ nf/40s-44s-46s (mixed)	35.23	8.71	24.7
155	NZ nf/40s-44s-46s (mixed)	35.17	8.84	25.1
	34.40 to 36.19 microns (44s)--Continued			
310	W Germ nf/40s	35.13	10.24	29.2
202	Arg BA 5/6s nf/40s	35.07	9.86	28.1
370	Arg BA 5/6s nf/40s	34.99	9.41	26.9
103	Arg BA 5/6s nf/40s	34.95	9.42	27.0
152	NZ crutchings 46s	34.93	8.18	23.4
335	NZ 2d shear nf/40s	34.86	9.36	26.8
142	NZ "B" 46s	34.76	8.22	23.6
105	NZ "B" nf/40s	34.75	8.81	25.4
195	NZ crutchings nf/40s	34.73	9.60	27.6
432	W Germ nf/40s	34.59	10.21	29.5
350	Arg BA 5/6s nf/40s	34.58	9.03	26.1
121	NZ crutchings blend 44s	34.47	9.82	28.5
	32.70 to 34.39 microns (46s)			
182	Arg BA 5/6s nf/40s	34.27	9.35	27.3
233	Austl "B" 44s	34.20	8.35	24.4
192	Arg BA 5/6s nf/40s	34.06	10.00	29.4
172	Arg BA 5/6s nf/40s	34.03	9.09	26.7
171	NZ 2d shear 46s	34.03	9.07	26.6
322	Uru nf/40s	34.02	7.97	23.4
131	NZ crutchings blend 44s	33.92	8.58	25.3
261	NZ soft cotted nf/40s	33.79	8.69	25.7
472	Irish nf/40s	33.77	9.79	29.0
400	Arg BA 5/6s nf/40s	33.74	8.92	26.4
381	NZ felt 46s	33.64	8.31	24.7
271	NZ Dag 44s	33.51	9.42	28.1
181	NZ "B" f/46s	33.38	8.60	25.8
132	NZ 2d shear f/46s	33.28	8.15	24.5
470	Arg BA 5/6s nf/40s	33.27	8.91	26.8
391	NZ felt 46s	33.13	8.62	26.0
122	NZ 2d shear f/46s	33.04	8.91	27.0
151	NZ 2d shear f/46s	32.97	8.74	26.5
302	NZ felt 46s	32.89	8.27	25.1
113	Arg BA 5/6s nf/40s	32.79	9.22	28.1
	31.00 to 32.69 microns (48s)			
190	NZ "B" 44s	32.31	8.32	25.8
311	NZ felt 46s	32.17	8.94	27.8
365	Uru Monte Criolla 44s	31.14	9.56	30.7
	29.40 to 30.99 microns (50s)			
360	Arg BA 5/6s nf/40s	30.94	10.02	32.4

1/ Assigned by the U.S. Bureau of Customs. The terms "nf/40s" is used to denote all wools not finer than 40s. The term "44s" is used to denote wools finer than 40s, but not finer than 44s. The term "46s" is used to denote wools finer than 44s, but not finer than 46s. The term "f/46s" is used to denote all wools finer than 46s.

Table 6D.--Numerical grades of improved wools based on micron results of 3 laboratories 1/

Sample No.	Description	Laboratory A	Laboratory B	Laboratory C	Sample No.	Description	Laboratory A	Laboratory B	Laboratory C
331	NZ felt	36s	40s	40s	262	UK Devon	c/36s	c/36s	c/36s
351	NZ felt	40s	40s	40s	312	Uru	40s	40s	44s
371	NZ felt	40s	40s	40s	322	Uru	46s	46s	46s
261	NZ soft cotted	44s	46s	46s	301	NZ felt	40s	40s	40s
105	NZ "B"	44s	40s	44s	341	NZ felt	40s	40s	44s
340	NZ "B"	40s	40s	40s	345	NZ felt	40s	40s	40s
330	NZ early shorn	40s	44s	44s	361	NZ felt	40s	40s	44s
115	NZ 2d shear	40s	40s	44s	321	NZ felt	40s	40s	40s
335	NZ 2d shear	46s	46s	44s	213	NZ felt	40s	40s	44s
135	NZ pulled	40s	40s	44s	253	NZ "B"	40s	40s	44s
101	NZ crutchings	40s	40s	40s	190	NZ "B"	46s	46s	48s
145	NZ crutchings	40s	2/	40s	325	NZ early shorn	40s	44s	40s
162	NZ crutchings	36s	40s	44s	161	NZ 2d shear	40s	36s	40s
165	NZ crutchings	40s	40s	40s	102	NZ crutchings	36s	36s	40s
185	NZ crutchings	40s	2/	40s	112	NZ crutchings	36s	36s	40s
195	NZ crutchings	40s	40s	44s	191	NZ crutchings	36s	36s	40s
320	NZ crutchings	40s	44s	40s	121	NZ crutchings, blend	44s	44s	44s
103	Arg BA 5/6s	40s	40s	44s	131	NZ crutchings, blend	44s	2/	46s
182	Arg BA 5/6s	44s	2/	46s	141	NZ crutchings, blend	44s	44s	44s
202	Arg BA 5/6s	44s	2/	44s	271	NZ Dag	44s	46s	46s
212	Arg BA 5/6s	44s	2/	44s	203	Irish felt	40s	40s	40s
222	Arg BA 5/6s	40s	44s	44s	292	Irish felt	40s	44s	44s
491	Arg BA 5/6s	44s	2/	44s	233	Austl "B"	44s	44s	46s
231	Arg BA 5/6s	44s	2/	44s	365	Uru Monte Criolla	48s	48s	48s
370	Arg BA 5/6s	44s	44s	44s	302	NZ felt	46s	46s	46s
400	Arg BA 5/6s	44s	2/	46s	311	NZ felt	46s	48s	48s
172	Arg BA 5/6s	44s	44s	46s	381	NZ felt	46s	46s	46s
470	Arg BA 5/6s	44s	2/	46s	391	NZ felt	46s	48s	46s
192	Arg BA 5/6s	46s	2/	46s	142	NZ "B"	40s	46s	44s
350	Arg BA 5/6s	44s	44s	44s	243	NZ "C"	44s	40s	44s
360	Arg BA 5/6s	48s	50s	50s	171	NZ 2d shear	44s	44s	46s
113	Arg BA 5/6s	46s	46s	46s	152	NZ crutchings	40s	44s	44s
305	W Germ	40s	44s	44s	181	NZ "B"	46s	46s	46s
310	W Germ	40s	46s	44s	122	NZ 2d shear	46s	46s	46s
432	W Germ	40s	40s	44s	132	NZ 2d shear	44s	46s	46s
315	Irish	40s	44s	40s	151	NZ 2d shear	46s	46s	46s
223	Irish	40s	40s	44s	111	NZ 44s-46s	40s	2/	44s
280	Irish	36s	40s	40s	125	NZ 40s-44s-46s	40s	2/	40s
472	Irish	44s	44s	46s	155	NZ 40s-44s-46s	44s	2/	44s
220	UK Devon	40s	40s	44s	175	NZ 40s-44s-46s	44s	2/	44s

1/ Grades based on the proposed U.S. Department of Agriculture micron standards.
2/ Not analyzed.

Table 6E.--Tariff classification of improved wools as visually determined by U.S. Bureau of Customs and as determined from micron analyses by 3 laboratories

(Micron grades put on a basis comparable to those provided for in the Tariff Act of 1930, as amended. Micron grades of 36s and 40s combined to "nf/40s"; micron grades of 48s and all finer grades combined to "f/46s")

Sample No.	Description and customs (visual) classification 1/	Micron grade based on test results reported by-- Laboratory A	Laboratory B	Laboratory C
	Nf/40s			
331	NZ felt	nf/40s	nf/40s	nf/40s
351	NZ felt	nf/40s	nf/40s	nf/40s
371	NZ felt	nf/40s	nf/40s	nf/40s
261	NZ soft cotted	44s	46s	46s
105	NZ "B"	44s	nf/40s	44s
340	NZ "B"	nf/40s	nf/40s	nf/40s
330	NZ early shorn	nf/40s	44s	44s
115	NZ 2d shear	nf/40s	nf/40s	44s
335	NZ 2d shear	46s	46s	44s
135	NZ pulled	nf/40s	nf/40s	44s
101	NZ crutchings	nf/40s	nf/40s	nf/40s
145	NZ crutchings	nf/40s	2/	nf/40s
162	NZ crutchings	nf/40s	nf/40s	44s
165	NZ crutchings	nf/40s	nf/40s	nf/40s
185	NZ crutchings	nf/40s	2/	nf/40s
195	NZ crutchings	nf/40s	nf/40s	44s
320	NZ crutchings	nf/40s	44s	nf/40s
103	Arg BA 5/6s	nf/40s	nf/40s	44s
182	Arg BA 5/6s	44s	2/	46s
202	Arg BA 5/6s	44s	2/	44s
212	Arg BA 5/6s	44s	2/	44s
222	Arg BA 5/6s	nf/40s	44s	44s
491	Arg BA 5/6s	44s	2/	44s
231	Arg BA 5/6s	44s	2/	44s
370	Arg BA 5/6s	44s	44s	44s
400	Arg BA 5/6s	44s	2/	46s
172	Arg BA 5/6s	44s	44s	46s
470	Arg BA 5/6s	44s	2/	46s
192	Arg BA 5/6s	46s	2/	46s
350	Arg BA 5/6s	44s	44s	44s
360	Arg BA 5/6s	f/46s	f/46s	f/46s
113	Arg BA 5/6s	46s	46s	46s
305	W Germ	nf/40s	44s	44s
310	W Germ	nf/40s	46s	44s
432	W Germ	nf/40s	nf/40s	44s
315	Irish	nf/40s	44s	nf/40s
223	Irish	nf/40s	nf/40s	44s
280	Irish	nf/40s	nf/40s	nf/40s
472	Irish	44s	44s	46s
220	UK Devon	nf/40s	nf/40s	44s
262	UK Devon	nf/40s	nf/40s	nf/40s
312	Uru	nf/40s	nf/40s	44s
322	Uru	46s	46s	46s
301	NZ felt	nf/40s	nf/40s	nf/40s
341	NZ felt	nf/40s	nf/40s	44s
345	NZ felt	nf/40s	nf/40s	nf/40s
361	NZ felt	nf/40s	nf/40s	44s
321	NZ felt	nf/40s	nf/40s	nf/40s
213	NZ felt	nf/40s	nf/40s	44s
253	NZ "B"	nf/40s	nf/40s	44s
190	NZ "B"	nf/40s	46s	f/46s
325	NZ early shorn	nf/40s	44s	nf/40s
161	NZ 2d shear	nf/40s	nf/40s	nf/40s
102	NZ crutchings	nf/40s	nf/40s	nf/40s
112	NZ crutchings	nf/40s	nf/40s	nf/40s
191	NZ crutchings	nf/40s	nf/40s	nf/40s
121	NZ crutchings, blend	44s	44s	44s
131	NZ crutchings, blend	44s	2/	46s
141	NZ crutchings, blend	44s	44s	44s
271	NZ Dag	44s	46s	46s
203	Irish felt	nf/40s	nf/40s	nf/40s
292	Irish felt	nf/40s	44s	44s
233	Austl	44s	44s	46s
365	Uru	f/46s	f/46s	f/46s
	46s			
302	NZ felt	46s	46s	46s
311	NZ felt	46s	f/46s	f/46s
381	NZ felt	46s	46s	46s
391	NZ felt	46s	f/46s	46s
142	NZ "B"	nf/40s	46s	44s
243	NZ "C"	44s	nf/40s	44s
171	NZ 2d shear	44s	44s	46s
152	NZ crutchings	nf/40s	44s	44s
	f/46s			
181	NZ "B"	46s	46s	46s
122	NZ 2d shear	46s	46s	46s
132	NZ 2d shear	44s	46s	46s
151	NZ 2d shear	46s	46s	46s
	Mixed			
111	NZ 44s-46s	nf/40s	2/	44s
125	NZ 40s-44s-46s	nf/40s	2/	nf/40s
155	NZ 40s-44s-46s	44s	2/	44s
175	NZ 40s-44s-46s	44s	2/	44s

1/ Assigned by the U.S. Bureau of Customs. The term "nf/40s" is used to denote all wools not finer than 40s. The term "44s" is used to denote wools finer than 40s, but not finer than 44s. The term "46s" is used to denote wools finer than 44s, but not finer than 46s. The term "f/46s" is used to denote all wools finer than 46s.

2/ Not analyzed.

Table 7.--Probabilities of "t" and chi-square for samples subjected to micron analysis by each of the 3 laboratories

Sample No.	Description and customs (visual) classification	Laboratory A			Laboratory B			Laboratory C		
		Difference between the average diameters of the duplicates		Probability of chi-square 2/	Difference between the average diameters of the duplicates		Probability of chi-square 2/	Difference between the average diameters of the duplicates		Probability of chi-square 2/
		Duplicate No. 1 less duplicate No. 2	Probability of "t" 1/		Duplicate No. 1 less duplicate No. 2	Probability of "t" 1/		Duplicate No. 1 less duplicate No. 2	Probability of "t" 1/	
	Named and similar	Microns	Percent	Percent	Microns	Percent	Percent	Microns	Percent	Percent
241	Cordova	+0.06	92	84	-1.32	9	59	-1.45	4	5
130	Scotch Blackface	+.45	65	87	-.68	34	1	-1.94	26	34
140	Scotch Blackface	-.27	72	17	+.48	64	11	-.31	82	31
250	Scotch Blackface	+.25	76	89	+1.16	31	20	+2.70	4	30
451	Scotch Blackface	-.70	42	85	-.65	56	24	+.25	85	6
375	Haslock	-.83	27	12	-.78	17	86	-.07	95	60
163	Welsh Mountain	+.53	40	24	+.46	48	29	+.58	54	67
173	Welsh Mountain	+.40	52	38	-.05	94	14	-.03	97	57
482	Welsh Mountain	-.43	56	50	+1.24	10	6	-.81	54	72
133	Cyprus	-.30	74	69	-.54	50	51	-1.33	26	3/
143	Cyprus	-.53	56	9	-1.60	9	88	-.89	44	24
153	Cyprus	+1.91	1	5	-.66	43	27	3/	4/	90
100	Sardinian	-1.47	14	77	-.63	46	26	-2.32	5	30
110	Sardinian	+.69	46	88	-.30	77	37	+.76	55	5
211	Aleppo	+.23	75	93	+.24	75	21	+.08	93	55
221	Aleppo	-2.04	3/	34	+1.07	19	49	-.38	67	5
385	Aleppo	+1.06	21	55	-.28	68	8	-2.07	3	2
390	Aleppo	-1.20	12	64	-.26	67	49	-1.53	6	1
395	Aleppo	-.97	25	68	-.52	45	93	-1.24	29	77
480	Aleppo	+1.61	2	22	-1.04	23	13	+1.69	5	44
260	Awassi	+1.56	3	19	-.32	72	90	.00	4/	73
210	Awassi	-.65	30	79	-.42	56	32	-1.06	23	7
270	Awassi	+.36	59	3/	-.04	96	60	+.29	69	58
290	Awassi	+.59	39	73	3/	4/	97	-1.39	9	4
230	Iranian	+1.10	17	18	+.87	24	31	+.19	85	96
251	Iranian	-.96	27	36	-1.82	7	65	-1.21	25	62
282	Iranian	-1.01	22	43	+.12	89	94	-.47	66	88
450	Iranian	-.08	92	8	-.04	96	99	-1.98	5	55
461	Iranian	-.56	46	50	+.27	76	12	+1.05	17	48
471	Iranian	+1.32	12	50	5/	5/	5/	+.28	80	16
170	Joria	+.28	69	89	+.93	19	3/	-.28	80	7
240	Vicanere	-1.07	15	19	+.30	64	24	+.17	86	71
402	Bicanere	+.32	62	67	+1.51	5	47	+.50	52	33
410	Bicanere	-.25	71	69	3/	4/	55	-.42	61	43
460	Bicanere	-.30	66	92	5/	5/	5/	-1.19	14	39
200	East Indian	+.62	42	6	+1.62	11	6	-1.33	27	28
401	Montgomery	-.47	51	57	+.41	68	4	-.54	56	72
252	Montgomery	-.40	56	81	-1.54	10	2	-1.35	16	37
452	Montgomery	-.28	73	60	5/	5/	5/	-.15	88	38
490	Montgomery	-.19	81	57	5/	5/	5/	-.58	57	3/
492	East Indian	-.02	98	71	5/	5/	5/	+1.40	22	33
201	Pakistan	+.15	83	96	+.97	14	22	-.60	46	3/
180	Khorrassan	+.57	46	13	-.48	49	8	-.04	98	49
430	Khorrassan	+.21	78	36	5/	5/	5/	+.81	41	22

See footnotes at end of table.

Table 7.--Probabilities of "t" and chi-square for samples subjected to micron analysis by each of the 3 laboratories--Continued

Sample No.	Description and customs (visual) classification	Laboratory A			Laboratory B			Laboratory C		
		Difference between the average diameters of the duplicates		Probability of chi-square 2/	Difference between the average diameters of the duplicates		Probability of chi-square 2/	Difference between the average diameters of the duplicates		Probability of chi-square 2/
		Duplicate No. 1 less duplicate No. 2	Probability of "t" 1/		Duplicate No. 1 less duplicate No. 2	Probability of "t" 1/		Duplicate No. 1 less duplicate No. 2	Probability of "t" 1/	
	Named and Similar--Con.	Microns	Percent	Percent	Microns	Percent	Percent	Microns	Percent	Percent
421	Kandahar	-0.17	82	45	+1.65	5	27	-0.73	40	44
411	Kandahar	+.07	92	86	+.30	72	4	+.29	78	52
183	Mongolian	+.06	94	19	-1.15	2	10	-2.38	13	4
440	Mongolian	-.42	64	14	-.28	65	65	+2.86	6	38
462	Mongolian	-1.06	17	59	+1.42	13	12	+.42	75	41
272	Blackface	-.92	23	87	+.51	46	36	-.68	58	11
291	Karakul	-.07	92	79	-.68	40	3	-.94	26	6
380	Karakul	+.57	43	25	-.82	18	8	-.28	72	48
281	Zackel	+.23	77	88	.44	65	36	+.31	74	46
	Mixtures of named and improved									
123	Cordova and nf/40s	+.14	82	27	-.58	35	42	-.48	46	3/
355	Cordova and nf/40s	-.26	63	66	+.66	19	1	+.05	95	4/
481	Cordova and nf/40s	-.20	72	62	-.06	92	91	-1.11	10	25
150	Scotch Blackface and 40s	-.25	69	45	+.20	81	10	-.07	93	92
120	Sardinian and 40s	+.72	46	83	+.38	75	88	-.38	80	49
	Carpet blends									
160	Londonshire	+1.15	13	72	+.55	53	66	+1.99	3	1
420	English	-1.80	3/	12	+1.16	18	2	+.75	42	17
442	Welsh	+.06	92	87	5/	5/	5/	-.77	32	85
441	English crossbred	+.61	39	19	5/	5/	5/	+2.04	2	15
232	Holland	-.24	75	40	+.20	81	26	-1.41	11	28
242	Holland	+1.26	6	70	-.20	80	3	+.38	73	4
412	Holland	-.92	25	13	5/	5/	5/	+.17	85	15
422	Holland	-1.07	16	42	5/	5/	5/	+.56	56	15
	Improved: Not finer than 40s									
331	NZ felt	+.44	34	95	-.38	46	25	+.70	18	36
351	NZ felt	-.48	30	28	-1.27	2	39	+.02	97	14
371	NZ felt	+.28	52	72	-.76	13	40	+.63	21	23
261	Soft cotted	-1.08	2	10	-.50	36	3	+.90	7	36
105	NZ "B"	+.67	15	46	-.42	43	8	+.81	11	27
340	NZ "B"	-.56	24	86	+1.70	3/	3/	-.63	22	65
330	NZ early shorn	+.20	65	48	+.50	33	86	+.48	37	74
115	NZ 2d shear	+.68	18	3	+.27	63	9	+.59	25	83
335	NZ 2d shear	-.04	93	68	-.37	51	3	+.40	43	63
135	NZ pulled	-.07	87	26	+.26	63	4	-.33	48	81

See footnotes at end of table.

Table 7.--Probabilities of "t" and chi-square for samples subjected to micron analysis by each of the 3 laboratories--Continued

Sample No.	Description and customs (visual) classification	Laboratory A			Laboratory B			Laboratory C		
		Difference between the average diameters of the duplicates		Probability of chi-square 2/	Difference between the average diameters of the duplicates		Probability of chi-square 2/	Difference between the average diameters of the duplicates		Probability of chi-square 2/
		Duplicate No. 1 less duplicate No. 2	Probability of "t" 1/		Duplicate No. 1 less duplicate No. 2	Probability of "t" 1/		Duplicate No. 1 less duplicate No. 2	Probability of "t" 1/	
	Improved: Not finer than 40s--con.	Microns	Percent	Percent	Microns	Percent	Percent	Microns	Percent	Percent
101	NZ crutchings	-0.08	88	32	+0.18	76	25	-0.20	71	73
145	NZ crutchings	-.63	23	44	5/	5/	5/	-.48	39	43
162	NZ crutchings	-.17	74	31	+.65	29	3	+.31	58	39
165	NZ crutchings	-.27	53	29	-.04	94	3/	-.43	38	73
185	NZ crutchings	-.62	24	50	5/	5/	5/	-.27	62	83
195	NZ crutchings	+.51	27	33	+.50	40	1	-.22	69	59
320	NZ crutchings	+.16	78	50	-1.20	5	19	-1.13	7	13
103	Arg. BA 5/6s	+.16	76	79	-.54	35	73	+1.13	3	54
182	Arg. BA 5/6s	-.62	20	58	5/	5/	5/	+.45	40	38
202	Arg. BA 5/6s	+.94	5	8	5/	5/	5/	+1.00	7	62
212	Arg. BA 5/6s	+.08	87	19	5/	5/	5/	+.28	61	3/
222	Arg. BA 5/6s	+.68	17	69	+.24	66	22	-.17	74	10
491	Arg. BA 5/6s	-.46	35	8	5/	5/	5/	+.30	55	18
231	Arg. BA 5/6s	+.42	39	45	5/	5/	5/	+.37	47	23
370	Arg. BA 5/6s	+.33	50	54	+.68	17	13	-.23	67	20
400	Arg. BA 5/6s	+1.17	2	45	5/	5/	5/	+.45	38	66
172	Arg. BA 5/6s	-.26	58	34	-.14	83	46	-.28	59	62
470	Arg. BA 5/6s	-.41	40	88	5/	5/	5/	+.48	35	34
192	Arg. BA 5/6s	-.66	20	67	5/	5/	5/	-.28	62	4/
350	Arg. BA 5/6s	-.27	59	73	-.76	11	45	+.23	65	3
360	Arg. BA 5/6s	-.78	12	28	+.42	36	3	+.11	84	67
113	Arg. BA 5/6s	+.21	65	9	-.55	36	29	-.43	42	3/
305	W. German	-.13	81	32	-.02	97	7	-.80	17	76
310	W. German	-.42	43	79	+1.30	3	3/	-1.35	2	17
432	W. German	-.84	12	2	-.37	51	3/	-.12	84	2
315	Irish wethers	+.48	32	64	+.47	35	79	+.62	26	3/
223	Irish wethers	+.41	42	27	+1.17	4	3/	+1.94	3/	3/
280	Irish crossbred	+.41	39	83	+1.00	9	3/	-1.04	5	3/
472	Irish crossbred	+.01	98	75	+1.26	4	42	-.58	30	13
220	UK Devon	+.12	84	25	-1.74	3/	3	+.54	39	32
262	UK Devon	-.86	12	81	+.50	43	64	+.90	16	5
312	Uruguay	-.10	83	77	-1.59	3/	3/	-.24	62	92
322	Uruguay	-.79	5	68	+.25	60	48	+.21	64	79
	Improved: 44s									
301	NZ felt	-.38	38	28	-	100	77	+.22	64	6
341	NZ felt	-.28	54	25	+.20	69	41	-.77	11	40
345	NZ felt	-.71	10	2	-.25	63	30	-1.11	2	4
361	NZ felt	-3/	100	54	+.48	37	40	+1.24	2	22
321	NZ felt	-.28	55	9	-.25	62	8	-.52	27	68
213	NZ felt	+.40	38	34	+.88	10	5	-1.79	3/	3/
253	NZ "B"	-.94	4	22	-1.72	3/	8	-1.40	3/	20
190	NZ "B"	+.45	32	6	+.20	72	64	+.16	74	24

See footnotes at end of table.

Table 7.--Probabilities of "t" and chi-square for samples subjected to micron analysis by each of the 3 laboratories--Continued

Sample No.	Description and customs (visual) classification	Laboratory A: Difference between the average diameters of the duplicates: Duplicate No. 1 less duplicate No. 2	Laboratory A: Probability of "t" 1/	Laboratory A: Probability of chi-square 2/	Laboratory B: Difference between the average diameters of the duplicates: Duplicate No. 1 less duplicate No. 2	Laboratory B: Probability of "t" 1/	Laboratory B: Probability of chi-square 2/	Laboratory C: Difference between the average diameters of the duplicates: Duplicate No. 1 less duplicate No. 2	Laboratory C: Probability of "t" 1/	Laboratory C: Probability of chi-square 2/
	Improved: 44s-46s con.	Microns	Percent	Percent	Microns	Percent	Percent	Microns	Percent	Percent
325	NZ early shorn	-0.84	9	84	-0.58	28	21	-0.24	65	1
161	NZ 2d shear	-.14	76	15	-.78	16	3/	-.78	13	17
102	NZ crutchings	-.63	22	26	-.38	52	2	+.71	19	41
112	NZ crutchings	+.66	20	74	+1.08	10	8	+.47	39	5
191	NZ crutchings	+.53	31	29	-.91	17	19	-.56	33	58
121	NZ crutchings, blend	+.29	56	79	-.04	95	14	+.29	60	4
131	NZ crutchings, blend	+.26	61	18	5/	5/	5/	+.78	11	12
141	NZ crutchings, blend	+.34	51	5	-1.66	3/	4	-.77	17	22
271	NZ Dag	+.40	41	83	-1.28	3	33	+.11	85	85
203	Irish, felt	+.35	48	70	+.61	29	28	-.69	20	15
292	Irish, felt	-.80	12	44	-1.62	3/	2	+.38	50	34
233	Australian "B"	-1.10	1	24	-.14	81	9	-.28	55	97
365	Uru Monte Criolla	+.84	10	19	+1.08	3	3/	+.03	96	3/
	46s									
302	NZ felt	-.55	24	12	-.08	89	17	-.85	7	37
311	NZ felt	+.61	17	15	-.90	6	73	+.70	17	16
381	NZ felt	+.81	8	65	+.39	44	6	+.33	50	57
391	NZ felt	+.66	13	29	-.63	20	3	-.64	20	62
142	NZ "B"	-.13	78	87	-.62	23	68	+.09	84	29
243	NZ "C"	+.68	15	66	-.30	59	3/	-.92	7	4
171	NZ 2d shear	-.71	13	33	+.39	48	12	+.26	61	49
152	NZ crutchings	-.91	4	7	-.17	74	44	+.54	25	27
	48s									
181	NZ "B"	-.07	88	67	+.56	27	28	-.65	18	77
122	NZ 2d shear	+.15	75	20	+.62	24	32	+.55	28	39
132	NZ 2d shear	+.73	11	21	+.50	34	19	+.07	88	96
151	NZ 2d shear	+.68	13	58	+.14	79	3/	-.20	68	49
	Composite grades									
111	NZ 44s-46s	-.50	27	59	5/	5/	5/	-.53	29	19
125	NZ 40s-44s-46s	+.05	91	96	5/	5/	5/	+.03	95	7
155	NZ 40s-44s-46s	+.76	10	31	5/	5/	5/	+.91	7	58
175	NZ 40s-44s-46s	-.42	35	26	5/	5/	5/	+.45	36	71

1/ Percentage of times that a difference as large as or larger than that shown in the preceding column (Duplicate No. 1 less Duplicate No.2) would be expected to occur upon subsequent testing (assuming the duplicates were treated alike).

2/ Percentage of times that a chi-square as large as or larger than that which actually was obtained would be expected to occur upon subsequent testing (assuming the duplicates were treated alike).

3/ Less than 1 percent or .01 micron.

4/ More than 99 percent.

5/ Not tested.

Table 8.--Hand samples: Results of micron analyses performed by laboratories A and B

Sample No.	Description and customs visual classification 1/	Total fibers counted	Percent medullated fibers	Percent kemp fibers	Percentage of fibers in each micron cell																				
					10.00 to 14.99	15.00 to 19.99	20.00 to 24.99	25.00 to 29.99	30.00 to 34.99	35.00 to 39.99	40.00 to 44.99	45.00 to 49.99	50.00 to 54.99	55.00 to 59.99	60.00 to 64.99	65.00 to 69.99	70.00 to 74.99	75.00 to 79.99	80.00 to 84.99	85.00 to 89.99	90.00 to 94.99	95.00 to 99.99	100.00 and over
	Laboratory A																								
200	East Indian	1,600	11.25	7.94	4.4	16.5	21.5	16.4	11.4	7.7	6.7	4.1	3.2	1.4	1.4	2.3	1.2	0.6	0.4	0.4	0.1	0.1	0.2
220	UK Devon nf/40s	1,600	47.88	3.50	.6	3.2	10.2	13.6	16.0	16.4	14.8	11.3	6.4	4.1	1.9	.9	.1	.1	.1	.1	.1	.1	-
305	W Germany nf/40s	1,600	20.38	.06	.6	4.1	9.1	16.1	18.9	18.8	14.4	10.1	4.9	2.0	.6	.2	.1	.1	-	-	-	-	-
310	W Germany nf/40s	1,600	19.94	.38	.7	4.8	10.4	14.8	17.9	19.1	13.4	9.1	4.7	3.1	1.0	.7	.1	.1	.1	-	-	-	-
311	NZ felt 46s	1,600	11.56	-	.5	4.2	13.6	20.9	20.4	18.5	12.5	6.4	1.9	.8	.2	-	.1	-	-	-	-	-	-
312	Uruguay nf/40s	1,600	4.75	-	.2	2.2	8.4	15.1	17.7	23.9	17.2	8.3	4.1	2.0	.6	.3	-	-	-	-	-	-	-
315	Ireland nf/40s	1,600	23.00	.06	.3	1.3	4.4	12.5	18.9	24.0	20.0	10.2	5.4	2.4	.4	.2	-	-	-	-	-	-	-
320	NZ crutchings nf/40s	1,600	15.38	.25	.4	2.8	9.7	14.2	17.7	17.3	13.3	10.8	7.2	3.9	1.9	.4	.2	.1	-	-	-	-	.1
2/ 331	NZ felt nf/40s	1,600	5.32	-	.2	2.6	7.6	11.0	16.1	19.7	20.4	12.7	6.1	2.8	.4	.2	-	.2	-	-	-	-	-
345	NZ felt 44s	1,600	3.81	-	-	.8	5.8	12.6	19.5	21.5	19.9	13.3	4.5	1.7	.4	-	-	-	-	-	-	-	-
2/ 351	NZ felt nf/40s	1,600	11.81	-	.2	.7	4.8	11.4	16.3	19.4	19.5	15.6	7.1	3.4	1.3	.2	.1	-	-	-	-	-	-
371	NZ felt nf/40s	1,600	1.75	-	.1	1.1	5.0	11.0	16.7	22.3	21.5	14.1	6.6	1.3	.2	-	-	-	.1	-	-	-	-
2/ 375	Haslock	1,600	32.50	7.68	1.2	7.6	14.3	16.6	14.0	11.4	9.4	7.1	4.9	4.3	3.6	2.4	1.1	.6	.8	.4	.1	-	.2
391	NZ felt 46s	1,600	16.00	-	.5	5.5	13.2	19.1	20.3	17.7	13.4	7.1	2.3	.7	.1	.1	-	-	-	-	-	-	-
395	Aleppo	1,600	9.31	1.94	.8	11.2	17.4	18.3	11.4	9.6	5.7	6.0	4.1	5.2	2.7	2.4	1.3	.9	.6	.7	.8	.2	.7
	Laboratory B																						
200	East Indian	1,200	18.67	6.92	4.7	18.0	23.7	15.9	10.7	9.0	6.5	5.7	2.8	1.1	.8	.6	.4	.1	-	-	-	-	-
220	UK Devon nf/40s	1,200	58.25	3.67	.6	4.0	12.0	13.9	18.1	17.1	15.0	11.7	4.8	1.4	1.0	.3	.1	-	-	-	-	-	-
305	W Germany nf/40s	1,200	27.17	.17	.2	3.6	8.7	16.0	20.9	19.3	15.2	8.8	3.6	2.7	.7	.3	-	-	-	-	-	-	-
310	W Germany nf/40s	1,200	29.42	.83	.6	3.4	8.2	15.9	17.3	16.6	15.8	10.6	7.4	2.4	1.2	.3	.1	.2	-	-	-	-	-
311	NZ felt 46s	1,200	19.17	.25	1.0	7.2	13.9	23.2	20.8	18.0	9.6	4.7	1.3	.2	-	.1	-	-	-	-	-	-	-
312	Uruguay nf/40s	1,200	6.84	.17	.6	5.0	10.6	17.0	18.8	20.4	13.9	7.4	3.9	1.1	.9	.1	.2	.1	-	-	-	-	-
315	Ireland nf/40s	1,200	24.33	.34	.4	1.7	6.7	15.2	21.9	23.8	16.1	8.0	3.6	1.4	.5	.5	.1	.1	-	-	-	-	-
320	NZ crutchings nf/40s	1,200	19.25	.84	.6	4.4	12.2	20.0	16.9	16.1	12.7	8.8	3.8	2.5	1.3	.2	.3	.1	.1	-	-	-	-

1/ Visual grade assigned by the U.S. Bureau of Customs. The term "nf/40s" is used to denote all wools not finer than 40s. The term "44s" is used to denote wools finer than 40s, but not finer than 44s. The term "46s" is used to denote wools finer than 44s, but not finer than 46s.

2/ Results of 3 samples tested by laboratory A were found to be widely divergent; these samples were retested. The data presented are the retest data.

Table 9.--Hand and core sample comparisons: Data computed from results of micron analyses performed by laboratories A and B

Sample No.	Description and customs (visual) classification 1/	Measures based on micron analysis of hand samples given in table 7			Intralaboratory comparisons						Interlaboratory comparison of hand sample results from laboratories A and B		
					Comparison of hand sample duplicates			Comparison of hand and core samples					
		Average fiber diameter	Standard deviation	Coefficient of variation	Difference between average diameters of duplicates: Duplicate 1 less duplicate 2	Probability of "t" 2/	Probability of chi-square 3/	Difference between average diameters of hand and core samples: Hand less core	Probability of "t" 2/	Probability of chi-square 3/	Difference between average diameters of samples tested by each laboratory: Results of laboratory B less results of laboratory A	Probability of "t" 2/	Probability of chi-square 3/
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Laboratory A	Microns	Microns	Percent	Microns	Percent	Percent	Microns	Percent	Percent	Microns	Percent	Percent
200	East Indian	31.54	15.37	48.7	+0.24	76	17	-0.18	74	2	-	-	-
220	UK Devon nf/40s	37.62	11.48	30.5	+.41	48	34	-.05	90	70	-	-	-
305	W Germ nf/40s	35.79	9.98	27.9	+.56	26	34	-.57	14	4/	-	-	-
310	W Germ nf/40s	35.91	10.75	29.9	-1.05	5	30	-.40	30	25	-	-	-
311	NZ felt 46s	33.19	8.78	26.5	-.28	53	93	+.18	56	83	-	-	-
312	Uru nf/40s	36.29	9.14	25.2	-1.08	2	29	-.59	7	13	-	-	-
315	Irish nf/40s	37.79	8.72	23.1	+.36	41	96	+.12	73	4/	-	-	-
320	NZ crutchings nf/40s	37.44	11.13	29.7	+.71	20	9	+.84	3	4/	-	-	-
5/ 331	NZ felt nf/40s	37.91	9.75	25.7	-.16	74	19	-.19	57	10	-	-	-
345	NZ felt 44s	37.68	8.42	22.3	-.54	20	47	-.04	90	4/	-	-	-
5/ 351	NZ felt nf/40s	39.36	9.38	23.8	-.47	32	87	+1.42	4/	4/	-	-	-
371	NZ felt nf/40s	38.39	8.54	22.2	-.11	80	84	+.35	27	4/	-	-	-
5/ 375	Haslock	36.95	15.25	41.3	+.08	91	44	+.05	93	21	-	-	-
391	NZ felt 46s	33.25	8.96	26.9	+.05	91	77	+.01	97	21	-	-	-
395	Aleppo	36.50	17.84	48.8	+.17	85	28	+2.09	4/	4/	-	-	-
	Group probabilities					74	93		4/	4/	-	-	-
	Laboratory B												
200	East Indian	29.14	11.76	40.4	-.73	28	9	-2.44	4/	4/	-2.40	4/	4/
220	UK Devon nf/40s	35.75	10.20	28.5	-.03	96	45	-1.47	4/	4/	-1.87	4/	4/
305	W Germ nf/40s	35.76	9.59	26.8	-.37	50	44	+1.24	4/	4/	-.03	94	11
310	W Germ nf/40s	36.93	10.54	28.5	-.74	22	43	+2.93	4/	4/	+1.02	1	4/
311	NZ felt 46s	33.42	8.45	25.3	+.74	13	46	+1.94	4/	4/	+.23	49	4/
312	Uru nf/40s	34.72	9.81	28.3	-.22	69	9	-1.83	4/	4/	-1.57	4/	4/
315	Irish nf/40s	36.22	8.92	24.6	+.35	50	36	+.30	40	4	-1.57	4/	4/
320	NZ crutchings nf/40s	34.96	10.69	30.6	-.28	66	54	-.54	24	4/	-2.48	4/	4/
	Group probabilities					63	16		4/	4/		4/	4/

1/ Visual grade assigned by the U.S. Bureau of Customs.

2/ Percentage of times that a difference as large as, or larger than, that shown in the preceding column would be expected to occur upon subsequent testing (assuming that the duplicates were treated alike).

3/ Percentage of times that a chi-square as large as, or larger than, that which actually was obtained would be expected to occur upon subsequent testing (assuming that the duplicates were treated alike).

4/ Less than 1 percent.

5/ Results for 3 duplicates of 3 samples tested by laboratory A were found to be widely divergent; these samples were retested. The data presented are the retest data.

APPENDIX B

TECHNICAL INFORMATION ON STATISTICAL MEASURES

Technical Information on Statistical Measures

From the data on fiber-diameter distribution contained in tables 2, 3, and 4, the following statistical measures, which form the basis for most of the analysis in this report, were computed for each sample tested by each laboratory:

$\bar{X}$ - average (arithmetic mean) of fiber diameters.

$$\bar{X} = \frac{\Sigma fm}{n}$$

σ - standard deviation: a measure of the variation of the diameters of individual fibers from the mean diameter for the sample. One standard deviation on each side of the mean generally includes about two-thirds of the fibers in the wool sample.

$$\sigma = \sqrt{\frac{\Sigma fm^2 - \frac{1}{n}(\Sigma fm)^2}{n}}$$

V - coefficient of variation: a measure which expresses the standard deviation as a percentage of the arithmetic mean; a useful measure of the relative variability of different samples.

$$V = 100\frac{\sigma}{\bar{X}}$$

The symbols are defined as follows:

f = total number of fibers measured in a cell (for both duplicates)

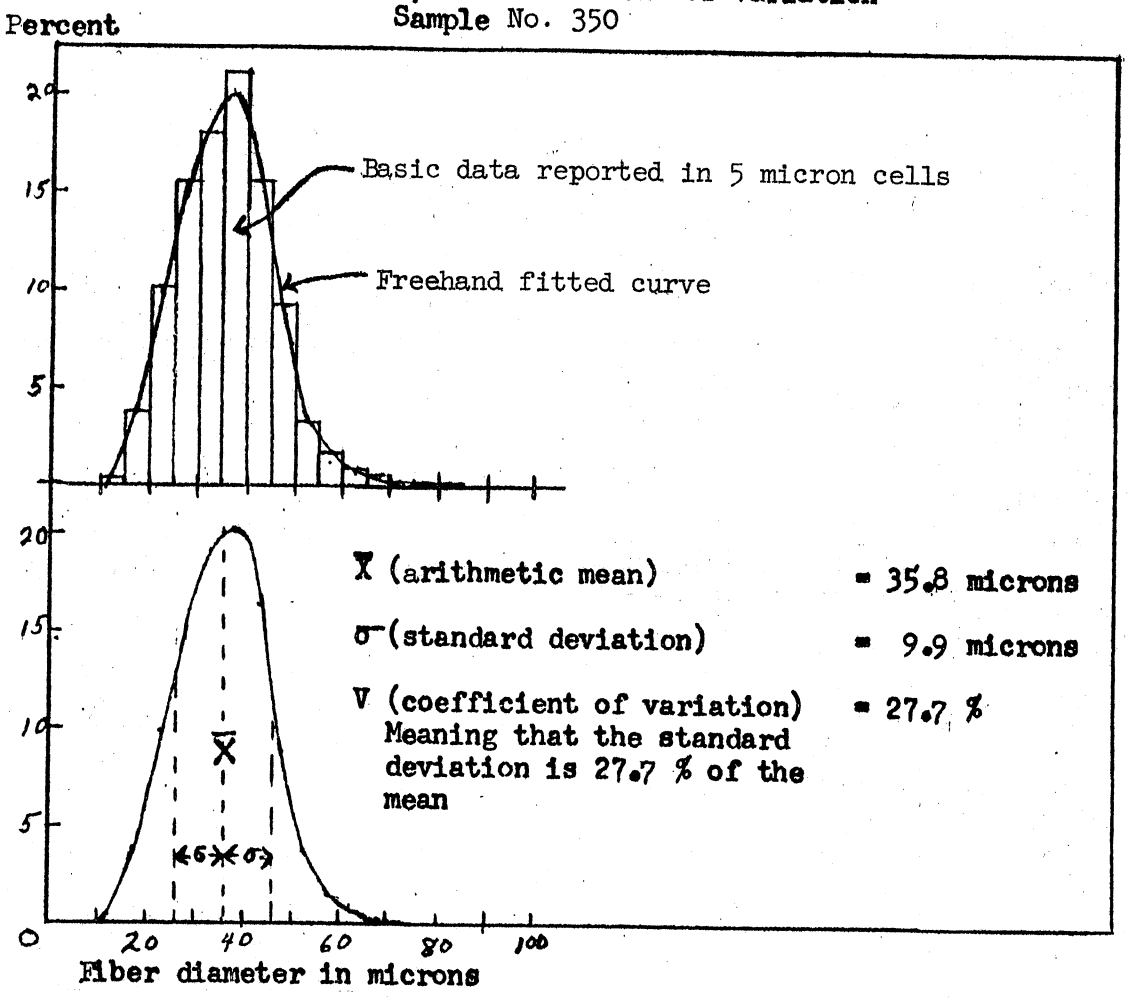
n = total number of fibers measured for the sample (all cells, both duplicates)

m = midpoint of a cell in microns

Σ = indicates that the calculation was performed for each cell of the sample and that these results were totaled

A graphic illustration of these measures is shown in figure 6. The top diagram shows the fiber distribution curve for sample No. 350 as determined by laboratory A. The bottom diagram shows the mean and standard deviation for that sample, and lists the coefficient of variation.

Figure 6.--Illustration of fiber diameter distribution, mean, standard deviation, and coefficient of variation



The calculation of these statistical measures was first performed by the laboratories and submitted in the reports sent to the Tariff Commission. It was found that their calculations were based on fiber diameters grouped into 2.5-micron cell intervals (the data they reported to the Commission, however, were in 5-micron cell intervals; see reporting form, p. 23), and that different procedures were employed by the laboratories to combine their measurements of sample duplicates. Consequently, all statistical measures were recomputed by the Tariff Commission, using a standard set of procedures. The results of these calculations are given in tables 5 and 6.

To assess the reliability of the basic data reported to the Commission, two additional statistical tests were employed; the chi-square test and the "t" test. These tests were used principally to assess the internal consistency of the micron data reported for each sample. Specifically, they provide numerical probabilities of obtaining differences, between duplicates that compose a sample, as large as, or larger than, those which were actually obtained under micron analysis. The chi-square test relates to differences between duplicates in distribution of fiber diameters and the "t" test relates to differences between duplicates in average fiber diameters.

The value of chi-square is calculated as follows:

$$\text{chi-square} = \sum \frac{(g-g_a)^2}{g_a}$$

g = actual number of fibers reported in any 5-micron cell for one duplicate

g_a = average number of fibers in the 5-micron cell per duplicate

Σ = indicates that the above calculations were performed for each cell of each duplicate and that the results of all these calculations were totaled to obtain a chi-square value. 1/

The chi-square value is then converted to a corresponding probability by using a statistical table designed for that purpose. 2/ This probability is the probability of obtaining a chi-square as large as, or larger than, the one calculated when the duplicates are treated alike. The probabilities obtained from the chi-square probability table for each core sample analyzed by each laboratory are given in table 7.

The second measure of the consistency of micron test results for duplicate samples is the "t" test. The value of "t" is calculated as follows:

$$\text{"t"} = \frac{c_1 - c_2}{\text{standard error of this difference}}$$

1/ Cells were combined where g_a was less than 8 fibers. See G. Udny Yule and M. G. Kendall, An Introduction to the Theory of Statistics, New York, 1950, 14th ed., p. 469, 20.18(b).

2/ Ibid., p. 665.

c_1 and c_2 - the average fiber diameters for duplicates 1 and 2 respectively.

Standard error of this difference - the standard error of the difference between c_1 and c_2; it is a measure of the variability that exists for mean differences of this size. 1/

The value of "t" (like the value of chi-square) is then converted to its corresponding probability by use of another statistical table. 2/ The differences between the means (c_1 minus c_2) of the duplicate cores and the probabilities of obtaining them are given in table 7 for all the samples tested by each laboratory. Like the probabilities shown in that table for chi-square, the "t" probabilities measure the relative frequency with which a "t" as large as, or larger than, the one calculated would be obtained when the duplicates are treated alike.

Chi-square values for the individual samples were combined to determine the significance of differences in fiber diameter distributions between sample duplicates for groups of samples. Probabilities (i.e., group probabilities) that relate to the chi-square values are shown on page 43. 3/

1/ The formula used for this measure was as follows:

Standard error of difference = $\sigma\sqrt{\frac{1}{p_1} + \frac{1}{p_2}}$ where 0 is the standard deviation for the sample, as defined on p. 78, and p_1 and p_2 are the number of fibers measured for each duplicate. For laboratories A and B this formula was equivalent to the more complex formula usually used: $\sqrt{\frac{\sigma_1^2}{p_1} + \frac{\sigma_2^2}{p_2}}$ (where σ_1^2 and σ_2^2 are the variances pertaining to each duplicate) since p_1 was equal to p_2. Use of the simple formula instead of the more complex, for laboratory C, leads to slightly different values for the standard error of the difference, owing to the different number of fibers in each duplicate. These differences are insignificant, however, since σ_1 and p_1 were approximately equal, respectively, to σ_2 and p_2.

2/ Yule, An Introduction to the Theory of Statistics, p. 664.

3/ The chi-square group probabilities were obtained in conformance with the procedure described by Yule, op. cit., pp. 473-474.

The values of "t" obtained from the "t" tests also were combined to determine the significance of differences between the mean diameters of sample duplicates for groups of samples. The probabilities (i.e., group probabilities) that relate to the "t" values also are shown on page 43. The group probabilities that relate to the "t" values are based on the fact that if there was no significant difference in treatment accorded duplicates the individual values of "t" would be normally distributed with a mean of zero and a standard deviation of one. To test whether there was a significant difference in treatment between duplicates viewed as a group, the following formula was used:

$$L = (\sigma_t - 1)\sqrt{2k}$$

L = resulting normal deviate (i.e., its mean is zero and its standard deviation is one) associated with the group probability

σ_t = standard deviation of all t's in the group

k = the number of samples (i.e., "t"'s) included in the group

The group probabilities relating to the "t" values, shown on page 43, are the probabilities associated with L.

It should be noted that the statistical inference when applying both of these tests is that there is no difference in the treatment accorded the duplicates. Where the probability is not extremely low, the analyst has no reason to suspect the validity of this hypothesis, since the results are then not in disagreement with the experimental design. 1/

On the other hand, where the probabilities indicate that the calculated chi-squares and "t"'s are unlikely (i.e., where the probabilities are low), the analyst must exercise some care in interpreting the data. A few improbable (low) test scores should be expected in testing large masses of data since the unusual does occur, though infrequently. It is the overall pattern of the data that is of primary concern. Should improbable test scores occur significantly more often than expected, it may indicate that the duplicates of samples have not been treated alike.

1/ The experimental design called for the drawing of two equally representative samples from each lot, each to be analyzed in the same way, so as to obtain equivalent results from the duplicates.