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Problems encountered in the wholesaling of raw wool, and the wholesale wool market of Boston.

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THESIS
Problems Encountered in the Wholesaling of Raw Wool, and the Wholesale Wool Market of Boston

By
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(B.S. Providence College, 1951)

Submitted in partial fulfillment of the requirements for the degree of
MASTER OF BUSINESS ADMINISTRATION
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table of Contents</td>
<td>1</td>
</tr>
<tr>
<td>List of Charts and Illustrations</td>
<td>2-3-4</td>
</tr>
<tr>
<td>Chapter I Introduction</td>
<td>5</td>
</tr>
<tr>
<td>A. Purpose and Scope</td>
<td>6</td>
</tr>
<tr>
<td>B. The Historic Importance of the Wool Trade</td>
<td>9</td>
</tr>
<tr>
<td>C. Economic Importance of the Wool Trade</td>
<td>10</td>
</tr>
<tr>
<td>D. The Rise of the Wool Industry in the U. S.</td>
<td>10</td>
</tr>
<tr>
<td>E. The Rise of Boston as a Raw Wool Trading Center</td>
<td>13</td>
</tr>
<tr>
<td>Chapter II Wool, the Product</td>
<td>16</td>
</tr>
<tr>
<td>A. Properties and Characteristics</td>
<td>16</td>
</tr>
<tr>
<td>B. Classes</td>
<td>19</td>
</tr>
<tr>
<td>C. Grades</td>
<td>25</td>
</tr>
<tr>
<td>D. Shrinkage</td>
<td>31</td>
</tr>
<tr>
<td>Chapter III The Primary Wool Markets</td>
<td>34</td>
</tr>
<tr>
<td>A. Domestic Sources</td>
<td>34</td>
</tr>
<tr>
<td>B. The Purchasing of Foreign Wool</td>
<td>47</td>
</tr>
<tr>
<td>1. Australia</td>
<td>47</td>
</tr>
<tr>
<td>2. London</td>
<td>50</td>
</tr>
<tr>
<td>3. South America</td>
<td>51</td>
</tr>
<tr>
<td>4. South Africa</td>
<td>52</td>
</tr>
<tr>
<td>5. Other Sources</td>
<td>53</td>
</tr>
<tr>
<td>Chapter IV The Wholesale Market</td>
<td>54</td>
</tr>
<tr>
<td>A. The Boston Market</td>
<td>54</td>
</tr>
<tr>
<td>B. Types and Functions of Establishments Comprising the Wool Trade</td>
<td>57</td>
</tr>
</tbody>
</table>
1. The Task of the Wool Dealers  
   a. Buying  
   b. Assembly  
   c. Handling  
   d. Financing  
   e. Distribution  

2. Foreign and Domestic Brokers  

3. The Street Brokers  

4. The Boston Wool Trade Association  

Chapter V  Problems of the Wool Wholesaler  

A. The Raw Wool Tariff  
   1. The Tariff As It Is  
   2. The Case Against the Raw Wool Tariff  
   3. A Solution to the Tariff Question  

B. The Tops and Raw Wool Futures Market  
   1. Introduction  
   2. Mechanics of the Market  
   3. The Value of the Wool Futures Market to the Wool Dealer  
      a. The Dealer's Problems in Merchandising  
      b. Why Many Dealers Hedge Their Operations  
      c. Full Time vs. Part Time Hedging  
      d. The General Method of Hedging by Dealers  

4. Conclusion  

Chapter VI  The Outlook for the Future of the Raw Wool Wholesaler and the Boston Market  

A. Synthetic Fibres vs. Wool Fibres
1. The Problem 109
   a. Reactions of Textile Manufacturers to Synthesis 114
   b. Hydrophobe vs. Hydrophilic 115
   c. Its Own Worst Enemy 119
2. Future Outlook for Wool in the Textile World 120
B. Effects of the Textile Shift from the New England or Boston Wool Market 121
   1. The Problem 121
   2. Solution 122
   3. Conclusion 124
C. The Future Outlook for the Wholesale Wool Industry and the Boston Wool Trade 125
VII Bibliography 133-134
# Lists of Charts and Illustrations

<table>
<thead>
<tr>
<th>Chart No.</th>
<th>Title</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>An Illustration of the Systematic Crossbreeding of Sheep</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>Relation of Clean Wool to Total Grease Wool in One Lot</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>Approximate Shrinkage Ranges of Domestic Wool</td>
<td>32</td>
</tr>
<tr>
<td>4</td>
<td>Number of Sheep and the Wool Production of Different Countries</td>
<td>33</td>
</tr>
<tr>
<td>5</td>
<td>U. S. Mill Consumption of Domestic and Foreign Wool</td>
<td>35</td>
</tr>
<tr>
<td>6</td>
<td>Shorn Wool Production and the Number of Sheep Listed by States</td>
<td>37</td>
</tr>
<tr>
<td>7</td>
<td>Weight and Size of Wool Sales</td>
<td>50</td>
</tr>
<tr>
<td>8</td>
<td>The Flow of Wool from Ranch to Mill</td>
<td>60</td>
</tr>
<tr>
<td>9</td>
<td>A Sample of Brokers' Offering</td>
<td>62</td>
</tr>
<tr>
<td>10</td>
<td>Graphic Illustration Showing the Geographical Location of Wool Manufacturers in the U. S.</td>
<td>67</td>
</tr>
<tr>
<td>11</td>
<td>Raw Wool Imports to the U. S.</td>
<td>68</td>
</tr>
<tr>
<td>12</td>
<td>Location of Manufacturing Establishments Processing Wool in the U. S.</td>
<td>71-72</td>
</tr>
<tr>
<td>13</td>
<td>The Wool Yield of the U. S.</td>
<td>73</td>
</tr>
<tr>
<td>14</td>
<td>Comparison of U. S. Production and Net Raw Wool Imports</td>
<td>83</td>
</tr>
<tr>
<td>15</td>
<td>Ninety-five Years of Wool Prices in Boston</td>
<td>100</td>
</tr>
<tr>
<td>16</td>
<td>Comparison of Properties of Synthetic Fibres</td>
<td>113</td>
</tr>
<tr>
<td>17</td>
<td>Number of Establishments in the U. S. Engaged in Wool and Hair Manufacture</td>
<td>130</td>
</tr>
<tr>
<td>18</td>
<td>A Comparison of the Number of Establishments Engaged in the Manufacture of Wool in the U. S. 1939-1947</td>
<td>131-132</td>
</tr>
</tbody>
</table>
CHAPTER I
INTRODUCTION

A. Purpose and scope. This paper is an attempt to bring to light and to analyze, in the most part for the first time, methods and problems involved in the marketing of raw wool. The scope of this paper will include all phases of the marketing of raw wool as it progresses from the backs of sheep, all over the world, to the warehouses of the wool manufacturers of the United States. This phase of marketing has somehow eluded any formal written presentation until this time. It is hoped that this thesis will in a small way help to further the analytical trend of making the study of marketing more scientific for the student of tomorrow.

The student of wholesaling, and most especially the student who is interested in the wholesaling of commodities, should find this thesis a great aid to his understanding of the marketing of a world commodity. It is truly said that those in the wool trade are glad to publish information relating to the wool market but extremely reticent in divulging information about the wool trade. A substantial amount of effort has been expended in compiling the facts and data contained in this report, but the end result has been well worth the effort. For here, for the first time to the author's knowledge, is a thorough analysis of wool the product, the wool market, and the wool trade.

This book should create a solid foundation on which the student can build, with the aid of practical experience, a well rounded wholesaling technique. This thesis will be of immeasurable aid to the
student in that it will make known buying and selling principles that should serve as a guide to him. It will uncover problems which must be met and solved; so that if the reader should ever be confronted with such problems, he will have the background and ability to recognize the considerations involved and thereby arrive at a sound logical conclusion.

Good successful wholesaling technique is the product of three factors. It should be based on sound theory, practical experience, and common sense. No wholesaling establishment can be successful profit-wise in the long run without these three all important factors to dictate policies, and find the solutions to problems. This thesis is designed to contribute to knowledge of the first two of these vital factors. It is hoped, therefore, that this paper may act as a direct means of promoting a greater understanding and a sounder more successful method of wholesaling wool.

It was not possible to cover the innumerable considerations and obstacles the wool wholesaler is called upon to face and to solve; therefore only those that generally assume the greatest importance are discussed. Certain background factors are discussed in the preliminary chapters because it is felt that an understanding of them is essential for an intelligent appreciation of the subject.

Chapter one sets the stage for the more technical aspects of the situation which will follow in the subsequent chapters. We briefly discuss the history of the wool industry, from dim antiquity up to, and including, the present day, in an attempt to show the evolution of the wool wholesaler and to establish the historic importance of the wool industry.
In the second chapter, the product itself is discussed because, to understand any marketing problem, it seems essential to know the product under discussion. Wool is a product of nature, not subject to product control; hence its lack of uniformity creates many problems in marketing the product. The raw wool fibre varies according to length, width, shrinkage, affinity to dye, color and foreign matter. It varies not only from flock to flock, from sheep to sheep, but also according to its location on the individual sheep. Hence it will be helpful if the reader understands the product.

Chapter three is an analysis of the sources of the product available to the wholesaler in Boston. There are many primary wool markets in the world; all are used by the wool dealer and most of these markets have different selling practices. These selling practices should be understood by the dealer trade in these markets. It seems an essential part of the problem to understanding the buying function of the wool wholesaler.

Chapter four deals with the largest wholesale market in the world. It analyses the physical makeup of the wholesale wool market in Boston; it is a summary of the functions of this market.

Chapter five deals with the question of the wool tariff, its effect on the farmer, the wool dealer and the ultimate consumer. In this chapter are contained the author's views and recommendations as they pertain to this particular tariff. In the second half of this chapter is a discussion of the wool futures market and its value to the wool dealer. Both points contained in this chapter are points very important to the wool dealer and that is why they are treated at such length.
On both points a complete analysis has been attempted and some logical recommendations made.

In chapter six, the future problems facing the raw wool market of Boston and the wool wholesaler are discussed. The gravity of the problems, their trend in the future, and this author's solution are contained in this final chapter.

B. Historical importance of the wool trade. The history of wool and sheep is older than written history. So important has the sheep been to man during our slow ascent out of the darkness of unrecorded history, that the lamb early became and continues to be a holy symbol of religious significance. Back even to the days of mythology, we find references to the "Golden Fleece".

At the time when Rome was in her glory, we have recorded by the writer Pliny,* an account of the great care given to sheep in order to obtain the best quality of wool from them. In fact the Romans produced the best quality of wool in the known world at that time. With the coming of silk and cotton, which were better adapted for use in the Mediterranean countries, the Italians gradually gave up to a great extent the raising of sheep for wool. Sheep became more valuable for food then for wool to the Mediterranean peoples.

The Italian breed of sheep was crossed with the native Spanish type of sheep to produce a new variety called to this day "Spanish Merinos". In the thirteenth century the Saracens, who were then established in Spain, carried the wool textile industry to the point that there were over 16,000 looms in the town of Seville. The product of these looms was renowned throughout Europe.**

* 8
** 6 P.15
The "Spanish Merinos" sheep were eventually shipped to France in the seventeenth century and to Norway, Denmark, Saxony, Prussia, Hungary, and England in the eighteenth century. In 1810 they were exported to Australia and later to the colonies in South Africa and South America. The Merino breed remains the best fine grade, long stapled, wool producer in the world and has become the backbone of the flocks of producers of these grades and lengths throughout the world.

C. The economic importance of wool trade. Empires have risen on the backs of the humble sheep and have fallen when the wealth they produced passed to other kingdoms.

Queen Elisabeth of England decreed the custom which still exists that all subjects swear allegiance to the kingdom by kneeling on a woolsack, and all British judges to sit upon a woolsack. This was to remind them constantly that the wealth of England was founded on the golden fleece of sheep.

Until the last century difficulties in transportation and communications prevented the development of a world wool market, although in the Middle Ages a thriving trade had developed among the wool staplers of England and the skilled artisans of the Lowlands.

It is said that the discovery of America was financed by Ferdinand and Isabella by mortgaging the royal taxes on wool; hence wool was important to America.

D. The rise of the wool industry in the United States. The first sheep to reach North America are said to have been left here by Columbus in 1493. Subsequent to this the Spanish explorers brought flocks of sheep with them. These flocks eventually moved, with their
moters, to southern California, New Mexico, and Arizona. There they remained, as did the wild horses, becoming acclimatized, and in time they were to become the sturdy basis for some of our great American flocks.

The first sheep introduced in the colonies are said to have been brought into Virginia by the London Company in the year 1609. New England, due to the necessity for wool clothing because of the severe climate, had the most sheep in the country. It is stated that in 1631 there were as many as 400 sheep in Charlestown, a part of Boston. These flocks were extremely slow in increasing because of the loss of sheep in severe winters, lack of care by the owners, and predatory animals. It is interesting to note that many flocks were herded on small islands off the coast of New England to protect them from wolves.

England's attempt to monopolize the manufactured woolen goods market reacted unfavorably in the colonies. Added to this restriction on native or colonial industry was the 200% increase in the price of goods sold in the colonies over the price in the home market. At the end of the period, which lasted from 1654 to 1715, woolen imports from England to the colonies had decreased by 50,000 pounds sterling a year. From this time until after the Revolution, it became a matter of patriotism to wear rough homespun garments of very coarse wool rather than the fine woolen garments produced in England, despite the fact that the price of imported garments had become much more equitable. During the Revolutionary War great stress was laid by the colonial government on increasing the size of the flocks and the quality of the wool produced by them. After the war fine woolens were once again imported from
England, but the colonists still relied mainly on their own coarse fabrics.

During the time between the Revolutionary War and the War of 1812, Merino sheep were imported and the quality of the wool produced in the colonies became better. After 1807 due to the Embargo Act the importation of woolens were reduced to zero. Out of sheer necessity the colonists began to manufacture woolen fabrics on a large scale. By 1810 there were approximately 2½ woolen mills in existence east of the Mississippi.

After 1840 the wool growing industry in New England and the Middle Atlantic States began to decline and never since that time has it recovered the position it once held. As the colonists moved west, the sheep raising industry went with them. Wool textile manufacturing industry remained in the East, principally in New England. In 1947 of a total of 828 manufacturing establishments* engaged primarily in wool manufacturing, 435 were situated in New England.

Wool is one of the world's most important articles of commerce as well as one of the most useful ones. In the year 1949 the total wool production was 3,780,000,000** pounds grease basis.# In this country in 1944 the cash income from wool was $147,000,000 from sheep and $303,000,000 from lambs, making a total of $450,000,000. United States production in 1947 was 309,000,000 pounds grease basis; however during the year 1947, the total United States mill consumption was 526,000,000 pounds of wool scoured basis. These figures are significant in that they illustrate

* 16 P. 169
** 20 P. 5-6
# Raw wool is wool containing natural impurities. See Shrinkage P-
   This figure is scoured basis for 10 classes of wool. To get
   approximate poundage grease basis add 60% (Scoured wool
   refers to wool which has had the impurities removed.)
the reliance of the United States on foreign wool production to the extent of 365,000,000 pounds clean basis in 1917. Total United States mill consumption of wool has gone from 274,000,000 pounds scoured basis in 1937 to 526,000,000 pounds in 1947, showing an increase of 251,000,000 pounds in ten years. This increase is not entirely due to a population increase; it is caused in part by an increase in per capita consumption of from 2.12 pounds, scoured basis in 1937 ** to 3.6 pounds in 1949.

From these figures we can readily establish the economic importance of the wool branch of the textile industry in the United States. In the year 1944 nearly half a million people were employed in sheep-raising and about 150,000 in the wool apparel industry. This industry is growing increasingly larger and is ever exerting more direct economic influence on the lives of every person in the United States. The economic influence is not only national; it is exerted internationally as well because many countries of the world are dependent to some extent on the wool industry in the United States. Because of the size of the United States wool production and consumption, the world market and world prices are directly related with the United States market.

E. The rise of Boston as a wholesale wool trading center.

Boston became a raw wool trading center for much the same reasons that New England originally became the wool growing center of the nation. As the wool growing industry became larger, so did the wool manufacturing industry in Boston. Boston was in the center of the original wool growing area, it offered good transportation facilities and an excellent harbor, it was also in the center of the wool manufacturing area.
A century ago practically all of the looms for wool were in New England. Boston merchants took advantage of the opportunity to go out to the farms and ranches in the East and later in the West, to buy wool at every shearing season. They brought it to their warehouses where they sorted it into different qualities suitable for different fabrics and maintained a steady supply of the fibre for the hungry looms of a growing country. The Boston merchants learned and developed a skill and experience that has been handed down to their successors today.

As the country grew, woolen and worsted spindles and looms spread beyond New England into the middle and southern areas, to the degree that hardly more than half of the yarns and fabrics are now made in the original area. The Boston wool merchants have learned to serve the distant mills just as well as those close by; for the automobile, the truck and the airplane have shortened distances remarkably. The wool salesman from Boston is found in the buying offices of the big mills in Georgia as much as in those of Maine, for the airplane has changed the distances to a matter of only a few hours. As the largest market, situated on a fine harbor, Boston continues to offer a selection of world types and quantities of wool unparalleled elsewhere. This is most important in these days of big operations and rapidly changing styles.

For the first time in history, the United States has within the past six years, become the world's largest consumer of wool and the most important producer of wool textiles in terms of yardage and dollar value. It has wrestled this proud position from the United Kingdom, which has held it for the past four hundred years. Boston's share of
this newly acquired position is a large one, for Boston is the capital of influence as a raw wool trading center and the executive headquarters of wool textile manufacturers. This supremacy of the United States as the No. 1 wool market has elevated Boston to the proud position of being the largest wool market in the world.
CHAPTER II

WOOL, THE PRODUCT

The proper scope of this thesis is the wholesaling of raw wool. To understand the marketing procedures and problems involved in the wholesaling of raw wool, we should first understand the product. In order to aid the reader to understand more fully the product, this second chapter contains a very brief description of the product.

A. PROPERTIES AND CHARACTERISTICS

Wool is an animal fibre differentiated from other hairs by having a crimped, curvy appearance. It has an internal formation composed of numerous minute cells. Hair has a comparatively smooth surface which will not stretch but will break off sharply. Wool is a perfectly elastic material. It is unique in this characteristic. It can be stretched to an enormous degree without breaking. A single wool fibre, if kept wet and stretched slowly, can be extended to 170% of its original length without breaking; and when the stretching force is released, it will return exactly to its former length.

Placed under the microscope, the wool fibre shows three distinct parts sufficiently characteristic to distinguish wool from all other fibres.

First is the epidermis, the outside or surface of the fibre. This part of the fibre is entirely covered with numerous serrations or scales, the free ends of which have a pointed rather than a rounded form. These scales form the sheath, or bark, of the fibre. They are
most important as their uniformity, soundness and compactness determine
the lustre, firmness and strength of the wool.

In fine Merino wool the individual scales are in the form of
cylindrical cusps, one somewhat overlapping the other. In other words,
a single scale completely surrounds the entire fibre. In lower grades
of wool two or more scales occur in the circumference of the fibre.

These scales, besides being flexible, have edges similar to a
saw, and it is principally on this account that wool possesses such
spinning and felting qualities. The length of the free or projecting
edge of the scale is also an important factor, as in some wools the
scale is free from the body of the fibre for about 1/3 of the length
of the scale. This wool would be most suitable for the preparation of
material for felting. Many manufacturers are limited to purchasing
certain types of wool according to these requirements, regardless of
the fact that the grades of wool of other types are the same.

These scales, as mentioned before, are most important in spin­
ing due to the fact that they catch, or interlock, with other fibres.
This, in the spinning of wool, causes an endless continuation of wool
fibres, the result being the finished yarn.

Typical wool fibre,
showing serrations or scales
The interior of the fibre is composed of spindle shaped cells and is called the "cortex". It is chiefly to this cortical tissue that the fibre owes its strength and elasticity. When the fibre is fine in staple, these cells show more or less unevenness in their growth and arrangement; the result is that the fibre is contracted on one side or the other, giving rise to the waviness or curled appearance of such wools. This waviness, or curl, to wool is generally termed the "crimp". This part of the fibre also possesses the affinity for dyes, or at least much more so than the scales.

The "pith", or core, of the fibre is called the "medulla" and is in reality a channel through which the fibre receives the juices which nourish and strengthen it. This tube also forms a space for absorption of dye stuffs.

Contrast between crimp and waviness

| A | Fine wool |
| B | 1/2 blood |
| C | Mohair |

Strength and durability have to be maintained in wearing apparel, yet heavy fabrics are tiring to wear. Lightness in weight is an essential in modern fabrics. Wool fibres are fine and light in weight. The diameter of fine wool, 90's quality, is about 1/2,000th of an inch. One ounce of wool fibre of 90's quality would measure 100 miles in length.
The heat retaining power of clothing is a factor of great importance in every climate. Wool has the lowest conductivity of any fibre, and therefore will retain heat in a warm body which it covers. Wool is twice as slow as cotton in increasing its conductivity due to moisture, and will retain heat better even when wet.

Some wools are naturally colored and cannot be washed out. This is due to pigment matter in the medulla. These natural black sheep produce wool running from light brown to black. Owing to the color, this wool can be dyed only in dark colors. Such wool is usually classed as a reject and sold from 10% to 20% under the price of white wools of the same quality.

B. CLASSES OF FLEECE WOOL

Practically all wool can be classified into four divisions. These are:

1. Merino
2. British
3. Crossbreds
4. Carpet wool

There are about 200 different breeds of sheep in the world, and their fleeces can all be classified into these four divisions. The breed of sheep influences the character of the wool grown on it and governs, to a great extent, the length and diameter of the fibre as well as other characteristics, such as strength, elasticity, shrinkage, color, lustre and waviness or crimp.

In grease wools the mill buyer first looks for grade, namely, the degree of fineness. The second requisite is length of staple to
meet his requirements. The third feature is the condition of the wool, such as shrinkage, freedom from vegetable matter, strength of staple and the price of the lot.

Before proceeding any further, we should immediately distinguish and establish in our minds the difference between a "carding wool, commonly called a "clothing" wool, and a "combing" wool.

By a carding or clothing wool we mean a wool the staple of which is too short to be combed. The length of the fibre determines whether the wool is of combing length, French combing length, or clothing length. The length may be of different degrees of fineness or different grades of quality.

Wool of combing length is used on the Bradford system of manufacture of worsted yarns, and the length of the fibre or staple must be 2½ inches or longer. The wool is "combed" to remove practically all of the fibres that are very short, called "noils". The remaining long fibres run parallel to form a soft rope called a "top".

French combing wools usually are wools which are too short in staple for the Bradford system, but which can be combed on what are called "French combs" and spun on the French system. The staple of French combing wools is approximately 1½ inches or more in length.

French combing wools do not command so high a price as strictly staple wool from the Bradford combing. During the past few years, due to competition, the wool of shorter staple, ordinarily sold as French combing wool, has been used on the Bradford combings, making a short fibred top and yarn.

Wools of clothing or carding length are fibres too short in
staple to be combed. They are, therefore, scoured and carded, to use
every fibre; no fibres are removed in the process of carding. These
go into the manufacture of a yarn called "wool yarn" to distinguish
it from the yarn called "worsted yarn".

The difference between a yarn called a worsted yarn and a
yarn called a wool yarn is that the former is made from long fibres
which are combed to remove all the short fibres and cause the long
fibres to remain parallel. Wool yarns are made from short-stapled
wool which is carded; the fibres do not run parallel but lie in all
directions.

Class I. Sheep of Merino blood are raised principally for
their fine wool, and the carcass of the sheep is usually small in com-
parison with that of the crossbred sheep. These sheep have descended
directly from the ancient Roman breed. They produce a very long staple,
fine wool, usually used to produce worsted cloth. Because of its fine-
ness and length the Merino wool commands premium prices.

Class II. The British type of sheep are divided into two
classes, the "Down" and the "Mountain". The Down class is by far the
most preferable, owing to the fact that the Mountain type is a smaller
sheep. Down wool is a very choice wool of medium order, especially
well adapted for the manufacture of knitting yarns which require a
wool of great loftiness and crimp. The Mountain wool is longer-
stapled and lower in grade with much less loftiness.

There are 36 distinct breeds of sheep in Great Britain, all
of them on the mutton order with heavy carcasses. It is, therefore,
only natural that these crossbreeds should be shipped to the colonies.
In Canada there are but a few Merino sheep; the great majority of Canadian sheep are of the British type. In New Zealand, the raising of crossbreds and the shipping of the clip together with the immense business in frozen carcasses and hides are the most important industries of the colony. Ninety-three per cent of New Zealand sheep are of the British type.

In Great Britain, as well as in the Colonies, each section specializes in its own type of sheep. This is also carried out systematically in New Zealand, Australia, South America and South Africa. In the United States, we have not been so systematic in our breeding of sheep. We have grown sheep according to the demand, both as to the mutton, and grade of wool desired. It has been a common occurrence for a flock owner, when certain grades of wool have been high in price, to ship all his lambs and breeders to the slaughter houses and purchase lambs and ewes of an entirely different breed to produce a wool more in demand than the wool obtained from his previous flock. Nevertheless, the mutton is the prime factor in this country, although in certain sections and counties in the states of Ohio and Michigan, the growers specialize in the Merino sheep.

**Class III. Cross breeds.** The object of cross breeding is to obtain dual-purpose sheep, possessing the strong points of each breed. The Merino is used to give a finer fleece and one of the British type to improve the weight of the sheep and the quality of the mutton. The results give the sheep owner a higher return for both his mutton and wool.

**Class IV.** The fourth and last class of wool is called "Carpet" wool. These wools, as the name implies, are used solely for the
manufacture of carpets and rugs. These wools are grown on sheep principally in Asia and South Western Europe. The sheep are unimproved native sheep, the fleeces of which are very light, uneven as to grade, coarse, and kempy. A kempy fibre is one which will not take a dye and is very brittle. Most of these wools are shorn twice a year and go into wool spun yarns for use in Axminster and Smyrna rugs. There are better grades of longer staple which are combed for use in Wiltons, Brussels and tapestry carpets and rugs. South America produces a most excellent long-stapled wool for carpets which comes principally from Argentina. Some of these carpet wools of the better order are used by woolen manufacturers for coarse fabrics.
AN ILLUSTRATION SHOWING SYSTEMATIC CROSSBREEDING OF SHEEP

Chart 1

LONG WOOL RAM  \rightarrow  HALF BREED  \rightarrow  3/4 BREED  \rightarrow  COME BACK  \rightarrow  FINE COME BACK
C. GRADES

Grade in wool refers to the quality or relative fineness of wool. The diameter or thickness of fibre determines the grade of wool; each grade has a name, a term or a numeral.

In the United States name or term is used, especially when classifying our domestic wools. These names or terms were handed down and still remain in use, although today they are used to define a type or grade of wool, rather than the amount of Merino blood in the sheep from which the wool was shorn.

In Bradford, England, the center of the wool and worsted industry of the British Empire, as well as in the British colonies and in South America, grades of wool are determined by what is called the "English count". In Canada wool is classed in the same way as in the United States.

The English count is the use of numerals instead of terms. This count system is most interesting, and to many minds is superior to our own, owing to the fact that by the count system wools can be classified to a finer degree. The following table is a simple comparison of the two systems in determining the grades of wool:

<table>
<thead>
<tr>
<th>AMERICAN</th>
<th>ENGLISH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine</td>
<td>64's to 70's</td>
</tr>
<tr>
<td>Halfblood</td>
<td>58's to 60's</td>
</tr>
<tr>
<td>Three-eighths blood</td>
<td>52's to 56's</td>
</tr>
<tr>
<td>Quarterblood</td>
<td>42's to 50's</td>
</tr>
<tr>
<td>Common &amp; Braid</td>
<td>30's to 40's</td>
</tr>
</tbody>
</table>
The basis for tentative length dimensions in wool grades is

The following:

<table>
<thead>
<tr>
<th>GRADE</th>
<th>CLOTHING UNDER</th>
<th>FRENCH FROM</th>
<th>COMING TO</th>
<th>STRICTLY STAPLE OVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine</td>
<td>1\frac{1}{2} in.</td>
<td>1\frac{1}{2} in.</td>
<td>2 in.</td>
<td>2 in.</td>
</tr>
<tr>
<td>Halfblood</td>
<td>1\frac{1}{4}</td>
<td>1\frac{1}{4}</td>
<td>2\frac{1}{2}</td>
<td>2\frac{1}{2}</td>
</tr>
<tr>
<td>Three-eighthsblood</td>
<td>1\frac{1}{8}</td>
<td>1\frac{1}{8}</td>
<td>2\frac{3}{8}</td>
<td>2\frac{3}{8}</td>
</tr>
<tr>
<td>Quarterblood</td>
<td>1\frac{3}{8}</td>
<td>1\frac{3}{8}</td>
<td>2\frac{3}{4}</td>
<td>2\frac{3}{4}</td>
</tr>
<tr>
<td>Low Quarter</td>
<td>2 in.</td>
<td>2 in.</td>
<td>3 in.</td>
<td>3 in.</td>
</tr>
</tbody>
</table>

* "Wool classing is the preparing of wool for market in as large lines as possible, by keeping wool of the same money value and quality, as far as practicable, together. The reason for this is to enable each buyer to select a line of wool of even quality and condition suitable for his requirements."

In 1938 The Commodity Credit Corporation authorized the making of loans to producers of wool and mohair produced in 1937 and 1938 on the basis of the 17 various classes of wool as set up by the Wool and Mohair Advisory Committee in 1933. Those classes have since become standard for the grading of the fibre in the wool industry, but they are not included here because it is our purpose to point out the difficulties involved in the grading of wool rather than give a complete study of this procedure.

The physical process of grading wool will be divided into two sections; first we will deal with the grading of domestic wool, and second, we will demonstrate the grading of foreign wool.

The grading of domestic wool is usually done in the various warehouses either at the large concentration points near where the wool is grown or at the points where the wool is sold. In the United States, wool is graded in the cities of Boston, Philadelphia, Chicago, * According to Mr. Henry B. Smith
and St. Louis, Boston receiving the bulk of the wool.

The largest mills often buy a quantity of wool ungraded, or in the original bags as it is called, and do their own grading, should it be required, in their own wool warehouses adjoining the mills.

Grading is most interesting. There are no fixed rules to govern or determine the grades or exactness, although the government through the Bureau of Standards and the Wool Division of the Department of Agriculture has established a set of grades that have become nearly universal throughout the country.

When a lot of domestic wool reaches the warehouse, the bags are opened up and taken to the grader who stands in front of a large table surrounded on three sides by large wooden baskets on rollers. The grader takes the fleece which has been passed to him. He opens the tied fleece a trifle, pulls out a small piece about the size of a lead pencil from the shoulders or back of the fleece. He tests it for strength and length of staple with his finger, while his eyes tell him the quality. He then turns the fleece over to see if the grade and the length of staple compare with his first estimate. If they do, he at once throws the fleece into a designated basket containing other fleeces of similar grade and length. Graded piles contain as high as 30,000 pounds at times before being bagged.

Great care is taken by the wool dealers in making their graded piles of wool most attractive and neat. They believe that merchandise well displayed is half sold. These piles are built upwards as nearly straight as possible with square corners.
GRADING OF FOREIGN WOOL

Great stress is given to the grading and classification of foreign wools, owing to the fact that in normal times the United States imports upwards of 300,000,000 pounds of wool grown outside of this country.

Australia, New Zealand, Cape Colony and the principal sheep-growing countries in South America assemble or put up their wools altogether differently from the United States method. Here, the fleece is shorn, rolled and tied, bagged and shipped. In the sections and countries just mentioned, the wool is sheared and then skirted. By "skirting" we mean removing the neck, belly, and leg pieces, as well as the low quality wool from the edges of the fleece. This latter wool is called the "britch".

In Australia and New Zealand, great care is taken in the skirting of the fleeces. These wools are sold all over the world according to standard types. They are purchased weeks and months ahead of delivery and must come up to the type for which they are sold.

The wool must be properly skirted, that is trimmed, so that deliveries will equal the samples that formed the basis of the purchase, otherwise future buyers would refuse to make orders on similar samples.

After the fleece has been skirted, it is ready for rolling; this is done to show the greatest advantage the shoulder wool.

In Australia no twine is ever used to tie the fleeces. In New Zealand growers fasten a large number of fleeces together by pulling a portion of the wool out of one end of the fleece and twisting it into
a thick, rope-like strand, stretching it over a portion of the fleece, and fastening it by inserting it into the fleece again. This prevents the possibility of hemp fibres from combining the twine with the wool. Hemp fibres will not take dye as wool fibres do and they are almost impossible to remove from the wool, hence they only show up in the finished fabric, an occurrence which manufacturers dread.

To conclude: We have seen the American method of assembling the wool at central locations and then grading it as contrasted to the Australian method in which the wool is graded at the place it is shorn.
RELATION OF CLEAN WOOL TO TOTAL GREASE WOOL IN ONE LOT

Chart 2

DATA FROM U.S. D.A. TECHNICAL BULLETIN NO. 85 TABLE II.
D. SHRINKAGE

Another major problem for the raw wool buyer is shrinkage, which occurs in the process of scouring.

The dirt, grease, and foreign matter in the wool must be removed before it can be processed into yarn. Wool is very absorbent, and the structure of the fibre causes almost everything with which it comes in contact to cling to the fleece.

The natural grease or yolk is always present, as well as suint or dried up perspiration; the weight of the latter is estimated to be approximately 15% of the total weight of the fleece. We also find such foreign matter as dirt, sand, burrs, seeds and manure in the wool. All of this matter, as well as natural grease suint, varies exceedingly according to the breed of sheep, the grade of wool, and the section, state or country in which the wool originated. The soil pasturage, care given to the sheep, and climatic conditions also enter into the question of shrinkage.

The shrinkage of wool, or the loss in weight after being scoured, varies from 20 to 30 per cent, but the average shrinkage for the United States is 60%.* As a general rule, the finer the grade of wool, the greater the shrinkage. Fine wool, therefore, as it is sold with the dirt and natural grease clinging to it, does not always bring a higher price per pound than the medium or low qualities. Usually the fine price is cents per pound lower, owing to the higher shrinkages of the fine wools in comparison with the light shrinkage of the lower grades. As a result the fine wool commands a higher scoured price because of its heavier shrinkage, even though the grease price be lower

*27 P. 15
than the grease price of the medium or low qualities.

All grease wool is purchased on what is called the clean value or clean cost. For example, a lot of wool in the grease is estimated to shrink 50% after being scoured. The scoured wool is thus 1/2 its original weight. This wool after scouring is called the yield. The actual market value of the wool is its cost after it has been scoured. In our example, if the clean wool was worth 50¢ per lb., then the grease value of the same wool would be 25¢ per lb.

Great care must be exercised on the part of both the buyer and the seller when estimating the shrinkage and yield of grease wool. If the shrinkage is underestimated to any great extent by the buyer, it would mean a heavy loss should the yield prove to be much less than believed. Overestimating the shrinkage on the part of the seller would prevent him from securing full value for his wool.

In many actual cases the seller’s estimate of the shrinkage of a lot of wool will vary from that of the buyer’s estimate, in such cases random samples will be drawn from the lot and scoured so that average shrinkage may be computed from the lot itself.

Chart 3 - Approximate shrinkage ranges of domestic wools *

<table>
<thead>
<tr>
<th>Grade</th>
<th>Placese wools</th>
<th>Territory wools</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bright</td>
<td>Semi-Bright</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>Percent</td>
</tr>
<tr>
<td>Fine</td>
<td>57-63</td>
<td>63-70</td>
</tr>
<tr>
<td>1/2 Blood</td>
<td>52-58</td>
<td>57-64</td>
</tr>
<tr>
<td>3/8 Blood</td>
<td>44-50</td>
<td>52-58</td>
</tr>
<tr>
<td>1/4 Blood</td>
<td>41-46</td>
<td>47-55</td>
</tr>
<tr>
<td>Low 1/4 Blood</td>
<td>38-43</td>
<td>43-50</td>
</tr>
<tr>
<td>Common and Braid</td>
<td>38-43</td>
<td>43-50</td>
</tr>
</tbody>
</table>

* 27, P. 3
**Chart 4 - Number of Sheep and Wool production of Different Countries**

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of Sheep (Approx.)</th>
<th>Wool Production (Approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>105,000,000</td>
<td>905,000,000</td>
</tr>
<tr>
<td>New Zealand</td>
<td>34,000,000</td>
<td>370,000,000</td>
</tr>
<tr>
<td>South Africa</td>
<td>35,000,000</td>
<td>228,000,000</td>
</tr>
<tr>
<td>Argentina</td>
<td>51,000,000</td>
<td>500,000,000</td>
</tr>
<tr>
<td>Uruguay</td>
<td>20,200,000</td>
<td>137,000,000</td>
</tr>
<tr>
<td>U. S. A.</td>
<td>47,900,000</td>
<td>390,000,000</td>
</tr>
<tr>
<td>U. S. S. R.</td>
<td>63,400,000</td>
<td>220,000,000</td>
</tr>
<tr>
<td>Great Britain</td>
<td>20,900,000</td>
<td>90,000,000</td>
</tr>
<tr>
<td>India</td>
<td>48,000,000</td>
<td>85,000,000</td>
</tr>
<tr>
<td>China</td>
<td>34,000,000</td>
<td>90,000,000</td>
</tr>
<tr>
<td>Spain</td>
<td>22,000,000</td>
<td>95,000,000</td>
</tr>
<tr>
<td>Others</td>
<td>213,600,000</td>
<td>650,000,000</td>
</tr>
<tr>
<td><strong>WORLD TOTAL (Approx.)</strong></td>
<td><strong>715,000,000</strong></td>
<td><strong>3,760,000,000</strong></td>
</tr>
</tbody>
</table>

*Grease basis: Poundage when estimated on a "grease" basis means wool which has not as yet been subjected to various cleaning processes. Loss in weight from grease to "clean" basis varies in the main between 50% and 70% leaving a "clean" yield of 50% to 30%. Prices based on a "grease" poundage are correspondingly lower than those based on the "clean" basis.*
CHAPTER III

A. The primary Markets.

Almost every country in the world raises some wool, in fact wool has one of the most universal uses of all fibres. The sheep raising industry in many countries is limited to the needs of that country; hence we will not be concerned with smaller, or marginal, producers. In this discussion of wholesaling of wool in Boston, we will limit ourselves to the larger primary markets in which the wholesaler from Boston must constantly do business.

The major sources of supply of raw apparel wool are found on Table 4. The countries listed in this table are arranged in order of their domestic production. The ratio of imports from these respective countries to the United States conforms to this same order, with the exception of Russia and China due to political conditions, and, of course, the United States itself.

This study of primary markets will be divided into two sections. The first section will deal with the domestic wool supply, and the second section will deal with the five principal foreign apparel wool markets and the rough or so-called carpet wool markets.  

Section I. Primary or domestic wool sources.

The primary domestic wool markets, or domestic sources of supply of wool fibres, are found within the bound of the continental United States. In the year 1947 sixty-nine per cent of the new raw wool fibres used in manufacturing in the United States were grown in the United States. This ratio is slowly changing. As the standard of living improves and the population of the United States increases, we are growing

*See Chart 5.*
### Chart 5

Mill consumption of domestic and foreign apparel wool, f.o.b. basis, in the United States, by years, 1920-50

<table>
<thead>
<tr>
<th>YEAR</th>
<th>DOMESTIC</th>
<th>FOREIGN</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Million</td>
<td>Million</td>
<td>Million</td>
</tr>
<tr>
<td></td>
<td>pounds</td>
<td>pounds</td>
<td>pounds</td>
</tr>
<tr>
<td>1920</td>
<td>114.8</td>
<td>149.5</td>
<td>264.3</td>
</tr>
<tr>
<td>1921</td>
<td>167.6</td>
<td>132.1</td>
<td>299.7</td>
</tr>
<tr>
<td>1922</td>
<td>208.4</td>
<td>104.4</td>
<td>312.8</td>
</tr>
<tr>
<td>1923</td>
<td>111.7</td>
<td>119.6</td>
<td>311.3</td>
</tr>
<tr>
<td>1924</td>
<td>158.4</td>
<td>91.3</td>
<td>249.7</td>
</tr>
<tr>
<td>1925</td>
<td>157.7</td>
<td>94.0</td>
<td>251.7</td>
</tr>
<tr>
<td>1926</td>
<td>165.5</td>
<td>89.2</td>
<td>254.7</td>
</tr>
<tr>
<td>1927</td>
<td>180.0</td>
<td>78.7</td>
<td>258.7</td>
</tr>
<tr>
<td>1928</td>
<td>161.9</td>
<td>50.5</td>
<td>232.4</td>
</tr>
<tr>
<td>1929</td>
<td>185.3</td>
<td>67.9</td>
<td>253.2</td>
</tr>
<tr>
<td>1930</td>
<td>149.9</td>
<td>50.8</td>
<td>200.7</td>
</tr>
<tr>
<td>1931</td>
<td>203.9</td>
<td>33.8</td>
<td>237.7</td>
</tr>
<tr>
<td>1932</td>
<td>175.5</td>
<td>22.0</td>
<td>187.5</td>
</tr>
<tr>
<td>1933</td>
<td>212.6</td>
<td>20.9</td>
<td>235.5</td>
</tr>
<tr>
<td>1934</td>
<td>115.0</td>
<td>22.6</td>
<td>137.6</td>
</tr>
<tr>
<td>1935</td>
<td>293.5</td>
<td>25.5</td>
<td>319.0</td>
</tr>
<tr>
<td>1936</td>
<td>229.1</td>
<td>70.7</td>
<td>299.8</td>
</tr>
<tr>
<td>1937</td>
<td>171.8</td>
<td>59.4</td>
<td>231.2</td>
</tr>
<tr>
<td>1938</td>
<td>192.2</td>
<td>26.4</td>
<td>218.6</td>
</tr>
<tr>
<td>1939</td>
<td>212.0</td>
<td>51.1</td>
<td>263.1</td>
</tr>
<tr>
<td>1940</td>
<td>215.1</td>
<td>94.9</td>
<td>310.0</td>
</tr>
<tr>
<td>1941</td>
<td>223.1</td>
<td>292.6</td>
<td>515.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOTAL</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Million</td>
<td>Million</td>
<td>Million</td>
</tr>
<tr>
<td></td>
<td>pounds</td>
<td>pounds</td>
<td>pounds</td>
</tr>
<tr>
<td>1942</td>
<td>214.4</td>
<td>327.0</td>
<td>541.4</td>
</tr>
<tr>
<td>1943</td>
<td>203.6</td>
<td>388.3</td>
<td>592.9</td>
</tr>
<tr>
<td>1944</td>
<td>150.9</td>
<td>426.1</td>
<td>577.0</td>
</tr>
<tr>
<td>1945</td>
<td>120.3</td>
<td>468.9</td>
<td>589.2</td>
</tr>
<tr>
<td>1946</td>
<td>106.9</td>
<td>502.7</td>
<td>609.6</td>
</tr>
<tr>
<td>1947</td>
<td>161.2</td>
<td>364.7</td>
<td>525.9</td>
</tr>
<tr>
<td>1948</td>
<td>120.7</td>
<td>179.5</td>
<td>300.2</td>
</tr>
</tbody>
</table>

*20, P. 71*
more and more dependent on sources other than those of our own country for our supply of wool. Our domestic wool industry has not met, and will not in the foreseeable future adequately meet, our domestic needs.* However, because at the present time the domestic primary raw wool market is the major single source of supply, we will treat it first and somewhat extensively because of its complexity.

Table 4 lists the principal sheep raising states and their annual production (for the year 1946).

In this country, nearly all of the wools are sold by growers directly to the wool merchants, although in the year 1930 our one-third of the domestic clip was consigned to the National Wool Pool, a cooperative organization.

The shearing season which begins in February in the south works northward through Utah, Colorado, Idaho, into Wyoming, Montana, Washington, and Canada, finishing in July. The wool merchants send their own wool buyers directly to the shearing sheds and ranches during the season. These buyers may go directly from Boston, or they may be local buyers who live in the West year round and who, during the shearing season, represent and purchase for the various wool merchants in Boston.

The local buyers, or "Country Buyers" as they are called, usually are paid one-half to two cents a pound for purchasing wool. This is their commission out of which they must pay their own expenses in traveling to different towns and ranches or wherever the wool happens to be. A buyer sent west by the wool wholesaler is usually on salary.

* "It is estimated that it will take at least 100 years before raw wool production in the U. S. will meet domestic needs."
### Chart 6

Shorn wool and number of sheep by States

<table>
<thead>
<tr>
<th>State</th>
<th>Shorn Production*</th>
<th>No. of Sheep Shorn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas</td>
<td>78,908,000 lb.</td>
<td>10,191,000</td>
</tr>
<tr>
<td>Wyoming</td>
<td>25,631,000 lb.</td>
<td>2,698,000</td>
</tr>
<tr>
<td>Montana</td>
<td>23,958,000 lb.</td>
<td>2,662,000</td>
</tr>
<tr>
<td>Utah</td>
<td>17,901,000 lb.</td>
<td>1,989,000</td>
</tr>
<tr>
<td>New Mexico</td>
<td>13,637,000 lb.</td>
<td>1,703,000</td>
</tr>
<tr>
<td>Colorado</td>
<td>13,372,000 lb.</td>
<td>1,537,000</td>
</tr>
<tr>
<td>Idaho</td>
<td>12,079,000 lb.</td>
<td>1,285,000</td>
</tr>
<tr>
<td>South Dakota</td>
<td>11,448,000 lb.</td>
<td>1,469,000</td>
</tr>
<tr>
<td>Ohio</td>
<td>12,231,000 lb.</td>
<td>1,510,000</td>
</tr>
<tr>
<td>California</td>
<td>19,967,000 lb.</td>
<td>2,925,000</td>
</tr>
<tr>
<td>Others</td>
<td>93,289,000 lb.</td>
<td>12,701,000</td>
</tr>
<tr>
<td>Total U. S. A.</td>
<td>322,621,000 lb.*</td>
<td>40,670,000</td>
</tr>
</tbody>
</table>

* This does not include pulled wool (from slaughtered sheep) which may total 116,000,000 pounds, grease basis.

Average yield shorn per sheep, 8 pounds per annum.
and all his expenses are paid by his employer.

The buying function of domestic wool is also shared by commission buyers, or buying brokers, from Boston and the East. These brokers will go West with purchasing orders. They will probably have orders from different mills who desire to purchase wools to meet their requirements for some time in advance, giving purchasing orders to commission buyers. For this service the commission buyer usually charges one-half cent a pound for purchasing. He takes care of paying the grower and attends to the shipping.

Some years, when higher prices are anticipated during the course of the year, and before the following year's clip is shorn, the wool merchants send their buyers west some weeks or months before shearing to contract for the wool on the sheep's backs. This means that the grower contracts to sell his wool at the agreed price and delivers the wool when shorn. In many instances, especially during the past few years, the purchaser pays a sum per head in advance to the grower, sometimes charging the grower 6% interest; but in many cases if competition is keen and buying or contracting is brisk, no charge is made.

If the merchant's judgment is correct, and prices have advanced before shearing, or even after shearing, he is able to secure an additional profit by this method of buying. For the past three years a great deal of contracting has been done on the sheep's back, but unfortunately for the wholesaler the rise in wool values has not materialized. In fact, values have gone considerably lower, and large sums of money were lost by this method of purchasing, although it proved most profitable to the grower.
On the whole this method of purchasing and buying is not profitable. Neither is it feasible, for successful merchandising cannot be accomplished unless there is profit for both the buyer and the seller. Same policy is not speculative, and speculation enters greatly into this method. The grower gambles when selling his wool on the sheep's back that prices will be lower, while the purchaser gambles that prices will be higher, and both hope that the condition of the fleece remains unchanged.

Fifteen and twenty years ago the grower was almost entirely ignorant of the value of his wool. He was governed solely by the price offered to him by various buyers and the price received by his neighbors. But today, through government market reports, cooperative marketing agencies, trade papers with their quotations direct from the wool-buying centers of Boston and other cities, the grading and sorting demonstrations given by cooperative associations and state agricultural experts, together with the radio, the sheep raiser is fairly well posted as to market conditions and the value of his own particular clip.

A well-posted progressive wholesaler charts each year the percentage by grades of each clip purchased, the shrinkage within each grade, the percentage of rejects, such as Bucks, Burry, Black, Dead, etc., together with a complete description, even securing an exact shrinkage as well as a mill report on the particular clip, if it is possible to do so. The merchant also keeps posted as to climate conditions. Their buyers, being informed, are probably better posted, on the particular grower's clip, than the grower himself. The buyer also has first hand information as to the market by wires each day from his house.

The buyer, as a rule, specialises in one section; that is, one buyer goes to Texas, New Mexico, Arizona, another buyer connected
with the same house will make his headquarters in Salt Lake City, while
another may be in Rawlins, Wyoming. Consequently, the buyer going to
the same district year after year becomes personally acquainted with
the growers, as well as their clips. In this way he has a decided ad-
vantage over new buyers or those who travel all over the West. In the
fleece section, the states bordering the Mississippi River, one buyer
is able to cover the entire section because of the splendid transporta-
tion facilities.

As a rule, the largest clips of wool are usually better bred
than the smaller flocks; consequently these largest clips are the ones
the buyers go after first. The buyer will usually visit the ranch of
the owner of the clip. The buyer always insists that the grower name
the price he wishes for his wool. By naming a figure, both the grower
and the buyer have a price on which to start trading. Naturally, the
price named by the grower is considerably out of line with the buyer’s
limits. The grower has an idea of what his wool should be worth, but
he knows the buyer will offer much below that figure so he names a price
of three to five cents a pound over the figure at which he would con-
sider selling.

The buyer, in turn, knows the value of the wool to his mill
customers, or at least for what the wool can be resold in the Boston
market. This is the market value secured. He is posted daily by his
firm by wire; most wool houses use a code, not only to save expenses,
but for secrecy. The buyer offers the grower a few cents a pound under
his limit, which is the top price he can pay, hoping that he can pur-
chase the wool at a little under his limit, but at least giving him a
little spread in price with which to trade.

A great deal of skill and diplomacy is brought to bear by the intended purchaser to secure the wool, especially if other buyers are at the ranch or expected daily. Many ranches now have telephones which enter into the buying.

When a price is finally settled on, the buyer usually sees the wool bagged, or if it is in bags he examines at least ten per cent of the bags. If the wool is carried on the sheep a large amount of tags, an allowance is made of from one to three per cent, according to the percentage of tags. Fine Buck wools are classed as "rejects" and are bagged separately, usually at a 25% reduction over the straight wool price.

Many of the clips in the West are in the hands of local banks, owing to the fact that the grower is obliged to borrow money during the course of the year to operate his ranch. He, therefore, places a chattel mortgage on his sheep. Some of these banks have many clips of wool for sale which are usually brought to some warehouse and offered for sale instead of at the various ranches. Consequently, the buyer has considerable wool in one place to examine and bid on.

These banks usually sell their holdings by two methods. One method is called a "private sale." By private sale, the buyer of the wool and the bank officials get together on a price, and no one, other than the two parties concerned, knows at what figure the wool is purchased.

The other method is called "sealed bid" sale. A bank may have a holding of a million and a half pounds of wool, each clip being kept
separate. The bank advertises that on a certain date it will receive 
bids on the various clips it intends to sell and that all bids are to 
be submitted by the buyers in sealed envelopes. These bids are to be 
in the hands of the bank at a named hour on a certain day, at which 
time they will be opened, and the one making the highest bid gets the 
wool in question.

Many sections and counties in a state, holding wools which 
are similar in grade and characteristics, pool their wools in one ware-
house and hold sealed bid sales in the same manner.

Wool buyers often get together among themselves and exchange 
ideas as to the values of certain clips and their buying limits. On a 
sealed bid sale, it has happened that the buyers get together and make 
a limit as to what they will bid, allowing one of them to bid a fraction 
of a cent higher than the others in order to obtain the wool. After-
wards, they divide or apportion the wool amongst themselves.

The buyers, on an average, work closely together and do not 
run the price up unnecessarily in order to secure a desirable clip of 
wool. It would work to their disadvantage when endeavoring to purchase 
wool in some other locality, as word of the prices at which they pur-
chased wool previously goes on ahead of them, making buying more 
difficult.

In the flesse section of the country, the purchase of wool dif-
fers from that in the West, due primarily to the method of collecting 
wool at some concentrated point. Most of the domestic is grown on 
farms, each farm having a small number of sheep. The number varies from 
three to 2,500; the average farm will probably have 50 heads of sheep 
on it.
When the wool was placed in the dye bath after boiling, it was noticed that the wool had not been properly prepared for dyeing. Before preparing the wool, the dyer must ensure that the wool has been properly cleaned and treated. In some cases, excessive care must be taken to ensure that the wool is free from any foreign materials. The dyer must also ensure that the wool is properly conditioned before dyeing to achieve the desired color.

In the context of preparing wool for dyeing, the dyer must ensure that the wool is free from any foreign materials that may interfere with the dyeing process. This includes removing any dirt, dust, or other impurities that may be present on the wool. The wool must also be properly conditioned, which involves ensuring that the wool is properly moistened and prepared for dyeing.

In conclusion, the preparation of wool for dyeing is a critical step in ensuring that the desired color is achieved. The dyer must take care to ensure that the wool is properly prepared and conditioned before dyeing to achieve the best results.
This is due to the fact that they are shorn under humid atmospheric conditions, for most of the farms in the East are situated in the midst of green grass and the wool takes on moisture from the dew. Wool from the time of shipment until they reach their destination at the large wool warehouse, or at the mill, are likely to lose up to four per cent of its weight. The buyer must take this into consideration when trading on a pile of fleece wool.

In the West, when wool is bought outright, the buyer pays by draft. The terms are always net except that a discount is allowed for all rejects. The tare or weight of the bags is deducted from the gross weight. The grower usually pays for the bags. The draft is taken to the bank and deposited. The terms are f.o.b. cars, the buyer paying the freight.

In the East, trade customs are a little different. When the mills send their own men to purchase wools at the concentration points, or should they be in the hands of the small dealer, he insists that the freight be prepaid to the mill and it is usually done.

An important source of domestic wool is called "pulled wool." This is wool that is taken from the pelts of sheep and lambs after they have been slaughtered. The pelt is treated with a depilatory to loosen the fibres; then the wool is pulled by hand from the pelt. As wool is being pulled, it is graded rather closely. Some manufacturers claim that pulled wool loses its strength and because the fibre still has its roots does not take dye evenly. There are opinions both pro and con in regard to the value of pulled wool, but the fact remains that over 55,000,000 pounds of wool or approximately 1/6 of our annual domestic production are pulled and offered for sale.
The marketing of domestic pulled wool may be described very briefly, because perhaps 90% or more of the pulled wool produced in this country is produced by meat packing houses, the bulk of it being produced by a few very large houses.

The packers store their pulled wool as they produce it at the producing points. They sell most of it through their Boston offices direct to consumer, covering the trade by traveling salesmen. They offer and sell pulled wool on the basis of very small samples. A two-pound sample may suffice to represent 20,000 pounds. They are able to sell this way because packers' pulled wool is even-running in quality. Consumers examine the packers' pulled wool that they buy when they receive it. If a consumer finds that the pulled wool received is not equal to the sample tendered at the time of purchase, he rejects it.

Some of the independent pulleries sell direct from the producing plants to consumers by traveling salesmen and correspondence. Others sell through commission agents in Boston. Dealers in Boston handle a considerable quantity of short pulled wool for the woollen trade, buying it from independent pulleries and merchandising it to consumers.

In summary of our study of domestic primary markets we see that raw wool may reach the manufacturer in any one of five ways:

1. The grower may sell his wool directly to the wool wholesale-saler either before or after shearing.

2. The wool grower may sell directly to the mill through a buyer representing the particular mill or sell it himself directly to a local mill. This is done only in the East. This practice of selling directly to mills is not too widespread because there are few mills large
enough to engage in direct buying. Secondly, because there are many
different grades of wool in each clip, and most mills are specialised
or limited as to the grades of wool they can use. The third deterrent
to this practice is the feeling on the part of mill managers that it is
unwise, due to changing styles and market conditions, to speculate on
wool for a period as long as a year.

3. The grower may, if his clip is large enough, consign his
wool to a merchant, a commission house, or to a wool broker who spe-
cialises in handling consignments, who in turn will sell them on a com-
mision basis. The grower may, or may not, secure a better price when
using this selling method, but he must pay the carrying charges plus a
commission in addition to waiting a considerable period of time for
the proceeds of his sale.

4. The smaller growers may sell their wool to local buyers
who may be general storekeepers, sheep shearsers, or local representa-
tives of wool dealers in the state. This wool is usually resold to
buyers representing the wool wholesaler.

5. Another method of selling the clip is by cooperative mar-
keting. This should be divided into two divisions:

a. Wool pools are areas where growers of a certain section
pool their accumulation of clips and offer the entire lot as one clip.
These large accumulations of wool are usually sold to the buyer who
will pay the highest price.

b. A second method of cooperative marketing practiced in the
growing of raw wool is through growers' cooperative associations. Most
associations have the growers sign agreements to deliver their wool to
their local associations. Some state cooperative associations have their own selling organizations in the East, but the bulk of the wool growers' cooperatives ship their wool to the National Wool Marketing Corporation. These selling organizations market the wool in the same manner as the wool wholesaler.

B. The Purchasing of Foreign Wool.

For many years producers of finished wool products have used foreign wool for specialty items and to augment our domestic wool supply. In the last twelve years as the domestic wool supply has dwindled and domestic demand for wool products has increased, wool manufacturers and wool wholesalers have become dependent on the foreign wool supply to satisfy the demand for wool products both on the part of the Armed Forces and of the civilian population of the United States. This shift in our source of supply is reflected by the fact that over two-thirds of the apparel wool consumed during the last ten years has been of foreign origin, compared with less than one-third prior to World War II. From these facts alone it becomes imperative that all who are interested in the wholesale aspect of wool have a knowledge of foreign primary markets.

The primary marketing method, prevailing in other civilized countries of the world, is auction on open competitive bidding. England first introduced this method and so it was natural that her colonies followed this example. At first the wools were all moved to consumption centers, but as the production grew larger, wools began to be sold at the point of origin.

1. Australia. In Australia the clip is usually consigned to broker-
age firms in the great auction centers rather than sold outright to local dealers. These wool brokers have representatives out early in the year among the growers, soliciting their consignments and making advances of funds, the clip being pledged for security. The wool is shorn and classed on the ranch and then shipped to the brokers' warehouse in Brisbane, Sidney, Melbourne, or Adelaide, whichever is the nearest point. The clip is stored and about 20% of the clip in bales is brought out into the show space or room of the broker's warehouse for display. A description of the clip, giving its quantity, grade, estimated yield, together with the owner's name, and where the wool is stored, is published in a catalogue together with descriptions of many other clips which are to go on sale by auction on a certain day.

These catalogues are published a number of days before the sale so that prospective buyers may go to the various warehouses and examine the wool, making notations in their catalogues as to their ideas of values and whether or not they desire to bid on the wool.

These buyers have seats at the auction, and have buying orders from all over the world based on type samples which they have previously sent to their correspondents. These correspondents give buying orders for a certain number of bales of a certain character or type of wool, with a limit to the buyer as to what he may pay. He will try to buy the wool under the limit unless he is so instructed.

The auctioneer is furnished with the owner's refusal price, and at three o'clock on each sale day, as designated, the auction begins at the wool exchange of the city. Many times, during inactive seasons, wools are withdrawn.
The wholesaler in Boston, to place an order to purchase a certain amount of a certain type of wool in Australia, must go to the various Boston representatives of the Australian wool buyers. He selects the type of wool desired and a cable is sent giving the number of bales desired and the limit he will pay on the basis of C. and F. Boston. C. and F. Boston means cost and freight delivered to Boston. The buyer in Australia at the auctions must purchase the wools at a price to include the charges of purchasing the wool and loading on to the boat plus the cost of transportation. We, however, must pay the insurance unless otherwise specified. Owing to the fact that the premium varies according to the boat on which the wool is shipped, the cost cannot be estimated previous to purchasing.

If the order is executed, the Boston buyer must get a letter of credit drawn on a London bank in sterling, not in dollars. The reason for this is that London is the banking center. Australia, in turn, as soon as it learns that the buyer has opened a letter of credit on a London bank, will then draw a draft on this London bank covering the amount of purchase.

Original weights are the basis for these transactions. The only time the wool is weighed is when the Australian grower ships his wool to the warehouse of his selling broker. It is not re-weighed when shipped to the United States. The bales are naturally re-weighed when they reach Boston. Should there be an error of a noticeable quantity, the practice is to have a sworn weigher send the weights to the buyer, who in turn makes a claim to the local agent of the Australian house who will forward the claim and make the adjustment.

See Chart 7 for weight and size of wool bales.
In New Zealand the wool is sold in the same manner as it is in Australia. Six auction sales are held during November and December at Wellington, Napier, Christchurch, Nelson, Timaru and Invercargill. The Boston wholesaler buys in the New Zealand market in exactly the same way that he buys in the Australian market.

Chart 7 - Weight and Size of Wool Bales

<table>
<thead>
<tr>
<th>Foreign</th>
<th>Type</th>
<th>Average weight of bale in pounds</th>
<th>Size of pkg. in feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentine</td>
<td>greasy</td>
<td>1,000</td>
<td>5 x 3 x 2 1/2</td>
</tr>
<tr>
<td>Argentine</td>
<td>scoured</td>
<td>700-800</td>
<td>5 x 3 x 2 1/2</td>
</tr>
<tr>
<td>Australian</td>
<td>greasy</td>
<td>330</td>
<td>3 x 2 1/2 x 2 1/2</td>
</tr>
<tr>
<td>Australian</td>
<td>scoured</td>
<td>250</td>
<td>3 x 2 1/2 x 2 1/2</td>
</tr>
<tr>
<td>South Africa</td>
<td>greasy</td>
<td>370</td>
<td>3 x 3 x 3</td>
</tr>
<tr>
<td>South Africa</td>
<td>scoured</td>
<td>210</td>
<td>3 x 3 x 3</td>
</tr>
<tr>
<td>English</td>
<td></td>
<td>500-600</td>
<td>6 x 4 x 4</td>
</tr>
<tr>
<td>Montevideo</td>
<td>greasy</td>
<td>1000</td>
<td>5 x 3 x 2 1/2</td>
</tr>
<tr>
<td>Montevideo</td>
<td>scoured</td>
<td>800</td>
<td>5 x 3 x 2 1/2</td>
</tr>
<tr>
<td>Domestic *</td>
<td></td>
<td>250-540</td>
<td>4 x 2 x 2 1/2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6 1/2 x 1 1/2 x 2</td>
</tr>
</tbody>
</table>

* Depending on state of origin.

2. London wool auctions: The wool from the British Isles and wool from all parts of the world are sold at the London wool auction. London was the greatest wool marketing center in the world, but its supreme position was lost to Sidney, Australia, which in turn lost its position to Boston, Massachusetts, U.S.A. As previously stated, the buying and
to the extent that they are capable. Many of the houses are planned or designed for multiple purposes, and the rooms are designed in such a way that they can be used for various functions, including entertaining guests. The houses are equipped with modern amenities, and they are convenient for people who work in the city. In London, the houses are located in a large area that is easy to reach by public transportation. For people who work in the city and plan to stay there for a long time, the houses are well suited for long-term stays. The houses in London are designed to be comfortable and practical, providing a good balance between work and leisure. 

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brokers who grade or classify and offer it for sale direct to dealers and mills all over the world. In the city of Buenos Aires is one of the largest wool markets in the world. Types of various broker's wool, as they classify it, are in the hands of their representatives in this country as well as in Europe. Cables are sent to the various representatives giving the number of bales they can offer of certain grades, the estimated yield, and the price desired in the grease, the terms being C.I.F.

The local representatives, as soon as they receive a cable from their principal, send out in a circular letter to their prospective customers a copy of the cable, giving the particulars of their offerings. A customer makes an offer on a quantity of the particular wool he desires and if the offer is accepted, the wool is shipped, and a letter of credit is secured from a local bank in dollars. Many Boston banks have their own branches in many of the principal cities in South America.

4. South Africa. Almost coincidental with the betterment of the wool production in South Africa in the last two decades, modern methods of wool marketing have been developed. Previous to this the South African clip was purchased in the North American way through speculative buyers or local merchants. Now, however, between 90 and 95% of their wool is handled on a brokerage basis for the accounts of the producers or through their own cooperative associations. The four main wool marketing centers of South African wool are East London, Durban, Port Elizabeth, and Capetown. The system of marketing varies in each center but in the main the methods are similar. Each wool center
maintains an organization of brokers for controlling wool movements and
prices in that particular market. The wool growers have no organization,
but their interests are represented by the brokers whose local organiza-
tions enter into agreement with the buyers as to terms of sale quantity
offered and withdrawals, etc.

5. Other Important Primary Wool Markets: Liverpool is an im-
portant market for wool especially carpet wools. These wools are col-
lected the world over and sold at Liverpool by auction sale similar to
the type held in London. The principal sources of carpet wools are:

<table>
<thead>
<tr>
<th>Great Britain</th>
<th>Italy</th>
<th>Egypt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iceland</td>
<td>India</td>
<td>Argentina</td>
</tr>
<tr>
<td>Mongolia</td>
<td>China</td>
<td>Asia Minor</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>Syria</td>
<td>Mesopotamia</td>
</tr>
<tr>
<td>Turkey &amp; Balkans</td>
<td></td>
<td>Russia &amp; Asia</td>
</tr>
</tbody>
</table>

The most important continental market centers are Antwerp, Hamburg,
Bremen, Havre, and Marseilles. South American wool is featured at
Antwerp, while in the other cities auction wools have been purchased
by dealers in the country of origin. European countries are heavy
purchasers of scoured wool, especially from Australia. Large quanti-
ties of wool known as offsorts are obtained by skirting, grading and
scouring in the country of origin. As these wools have an exceedingly
heavy shrinkage, a considerable saving is made on transportation charges,
and they can be presented for sale in a more attractive condition than
would be the case if they were offered in the original greasy condition.

These other foreign markets are rarely entered by the whole-
saler in the United States unless he is dealing in specialty products
or is attempting to sell some of his stock in one of those markets due
to abnormal market conditions.
CHAPTER IV
THE BOSTON MARKET

Since 1810 Boston has been the leading wool market in the United States. Its prominence in the storing, concentration, and trading of imported and domestic wools continues to today. During the years between 1869 and 1871, Boston handled a little over 35% of the imported wools brought into this country, while in 1886 it secured 56% of such wools. Just prior to World War I this figure rose to 72%.

In 1870, Boston took care of 35 to 40 per cent of the domestic wool clip. Just prior to World War I it handled 70% of the domestic clip. At present little trading in wool is done outside of Boston, Philadelphia, New York and Chicago. New York is prominent as a carpet wool and wool substitute market. Chicago is the leading pulled wool market and a carpet wool center, whereas Boston is renowned for handling all types of wool. In the year 1950 Boston handled 76% of the apparel wool imported to this country with a dollar value of $221,572,500. In the same year Boston ranked third in the processing of imported carpet wools, with a dollar value of $22,217,600.*

In the same year, 1950, Boston handled approximately 76% of our domestic wool production or 191,932,600 pounds grease basis, with a dollar value of $114,870,700. The total value of the wool inventory passing through Boston in 1950, including both domestic and foreign wool

From figures of U. S. Dept. of Agriculture, as computed by the Commercial Bulletin on the basis of past experience.

12, P. 8
is approximately $388,660,800. This represents a substantial amount of business not only for the wool dealers themselves but also for the Banks of Boston, the warehouses, truckers, riggers and shipping companies. This $388,660,800 business is carried on by 400 corporations, partnerships and individuals who make up the Boston wool trade.*

You need only to step out of the South Station to the corner of Atlantic Avenue and Summer Street and look around you. Here running half the length of Summer Street is what is sometimes called "The Grand Canyon of Wool" - a half mile corridor between old gray loft buildings split in the middle by a draw-bridge over Fort Point Channel.

Everything on this part of Summer Street says wool. It is written there in hundreds of traditional gold-letters, company signs that slab the fronts and sides of loft buildings. Bales of it rumble by, on the backs of trailer trucks, enroute from dock to warehouse or from warehouse to mill. Tufts of it tumble in the streets, blown from the sample rolls that wool salesmen carry on their ceaseless rounds of customers. This is Summer Street, Boston, Massachusetts, U.S.A., Mecca of the wool trade all over the world.

Boston gained its position, as wool marketing center of the world, for many reasons. It seemed to follow a natural growth sequence. First, Boston rose to the fore as the leading wool market in the United States, and then as the United States achieved the position of being the leading wool consumer and textile manufacturer in the world, Boston rode along, still holding her own position, that of being the largest market in the leading market area.

Boston took the lead as the No. 1 wool market in the United

* Figures from the Boston Wool Trade Association.
States, because of its location, banking facilities, port, transportation and storage facilities. Boston was in the center of both the sheep raising and wool manufacturing area of the colonial United States. Wool is a frontier crop. It has always been forced to the outskirts of civilization as sheep-grazing lands become more valuable for cattle raising or for the production of grain. Sheep raising followed this trend in the United States and was pushed farther and farther west until now the sheep raising industry seems to be in danger of passing from this country altogether. Until World War II the United States grew the bulk of the wool it consumed. Now it imports more than twice as much wool as it grows, mainly from Australia, South Africa, and South America.

As the raw wool production area moved west the wool manufacturing industry stayed in New England. The functions of the wool merchant became more important. Where once the wool textile industry was in the center of raw wool production area and the woollen mills could conceivably go out and buy their raw wool themselves, that condition has changed. It became necessary for the wool to be assembled from the frontier areas of its origin and shipped back East. As the mills grew larger they found it more profitable to buy their wool from dealers who were experts in this task of assembly. Boston evolved as the center of assembly because of its location. Up until the 1920's Boston could claim 95% of the nation's woollen and worsted looms within a 350 mile radius of the city. Today only a little more than 60% of the nation's woollen mills are still located within a 350 mile radius. However, as the mills drifted away from the Boston area a new center entered the

* The U. S. Government is attempting to combat this trend with little success. See 30.

** 15, July 15, 1952.
picture. Since 1920 the transportation facilities have been so greatly improved that the salesmen from Boston can still make their regular calls to the mills despite the ever widening distance.

Broadly speaking, the function of the wholesaler in Boston is a simple one. His problem is that of getting wool from the producer to the consumer, buying it from a ranch in Oregon or Ohio, a rancher in Argentina or Afghanistan, and selling it to a worsted mill in Maine or a woolen mill in Tennessee.

A. Types of Establishments Comprising the Wool Trade.

We can break the raw wool market down to three types of operations: Wool dealers, wool brokers, and street brokers.

1. Wool dealers. There are about three hundred wool dealers operating in the Boston market. These dealers take little to the raw wool. They buy the wool from primary markets, wool brokers, other wool dealers. There are 300 wool dealers in Boston, approximately 10 of these dealers are large dealers selling a relatively complete line of wool and wool waste fibres. (A complete line can run up to 6,000 different grades and classes of wool.) The largest wool dealer in Boston employs 60 people, while the smallest concern is a one man business. The inventories held by these dealers may run from ½ to 2 million dollars, dependent on the dealer and the market condition. The dealer is the real wholesaler of the wool trade. He is actuated solely by the profit motive, he buys large quantities of goods, being in excess of that which might reasonably be purchased by an ultimate consumer and he buys exclusively for resale. According to Mr. Beckman and Mr.
Engle, the wool dealer becomes a prime example of their concept of an establishment engaged in marketing on the wholesale level."

A. Buying Wool. The sources of wool available to the wool wholesaler are domestic and foreign wool markets. These sources have been previously discussed at length but I would like to recall to your memory at this time a few facts about them.

To buy foreign wool in the foreign market is a relatively simple process. The dealer in most cases will do his buying through a wool broker. There are almost 100 wool import brokers located in Boston alone. Wool can be bought through import brokers only during the selling season which runs from the beginning of November to the end of May. The dealer, if he is dealing in foreign wool, must anticipate this lapse in his supply, and order sufficient stock to tide him over until the next auction.

Buying domestic wool. Domestic wool may be bought in any of several ways. It may be bought direct from the ranches, it may be bought from local buyers, it may be bought through brokers, it may be bought from other dealers in the case of pulled wool, or it may be bought from packing houses or pulleries. Only the largest wool houses buy direct from the ranch through company buyers on the spot. The large dealers and some of the medium size dealers buy from local buyers. Today most domestic wool is handled by brokers. The commodity credit corporation, in its wool price support program will loan money to the rancher before shearing time. When the wool is sheared it is marketed through C.C.C. approved brokers, the amount of the loan and the brokerage fee being deducted and the remaining principal is returned to the owner. With this

Wholesaling Principles, Beckman and Engle. P. 17.
relatively new set-up, the wool wholesaler who deals in domestic wool usually buys from the broker. In discussions of buying we must always keep in mind that there are no hard and fast rules as to when the dealer will buy or where. In Boston there are several dozen Street brokers that go up and down Summer Street selling to dealers wool, owned by other dealers. All of the wool dealers have their own particular customers, the dealers know pretty much what his customer is going to require in any given period. This knowledge dictates his buying methods. The smaller dealers usually handle only a restricted line. However, if they think they can sell a lot of wool for more than they paid for it, enough more so that they will make a substantial profit, then they will buy.

The dealer's stock in trade is his knowledge of the market. He knows what he can sell at what price. Under these circumstances it becomes easy to understand why there can be no set rules as to when, and how to buy. It becomes easier to see dealers, dealing exclusively in waste wool and waste synthetic fibres, garnets, noils. Or on the other hand, picture the dealer who, like the used car dealer, will buy the finest wool or the poorest wool all dependent on the price offered and the dealer's own connections in the trade. All day long offerings are being made to the dealer. Street brokers, foreign wool brokers are calling him by phone, visiting at his office, sending offerings by mail or telegraph. They all have something to sell to him if he is interested. When a sale is made to the dealer there is very little salesmanship involved, the seller knows what line of wool the dealer is primarily interested in. They offer him a lot on sample, or if it is of standard grade class and shrinkage it might be offered by description.
EXHIBIT 8 ILLUSTRATING THE FLOW OF WOOL FROM THE RANCH TO THE MILL
If the dealer has a customer or a good prospect for the lot he may invest his capital in the offering.

The wool dealer has a good knowledge of wool prices. Weekly and daily reports are issued by different interested parties giving wool prices in Boston and at the various auctions all over the world. Chart 9 is a mimeograph notice of the wool prices at the closing of the market in May and the prices on the day of opening in November, in the New Zealand auction. After the auction the prices were telegraphed from Auckland to the broker representing Prevost and Co. LTD. The broker had the market report mimeographed and immediately mailed it out to all his potential customers. The morning after the auction when the dealers got to work, they found the report waiting on their desks. It is because of this speed of reporting prices that world wool prices are held in a relative balance.

B. Assembly: When the wool is purchased it is brought by ship, truck or rail to Boston. Transportation of wool takes varying amounts of time, dependent on where it was purchased. From New Zealand and Australia wool takes about from six to seven weeks to arrive here by steamship. From England it might take as little as ten days. From South Africa it takes about two weeks to arrive. If the wool is purchased in the United States it might take any time up to a week to arrive in Boston. It is interesting to note that the trend today seems to be that of shipping Australian and New Zealand wool by ship to the west coast of the United States, and then bringing the lot the rest of the way across the continent by train. The dealers find this method is

OPENING SALE - 1952/1953 SEASON
AUCKLAND - NOV. 10th

Sale opened strongly. English were the principal buyers; Japan and America buying nothing.

Quote:

**Fleece - Carding**

<table>
<thead>
<tr>
<th>Type</th>
<th>50/56s</th>
<th>B</th>
<th>Clean</th>
<th>Cl. Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 93</td>
<td>50/56s</td>
<td>B</td>
<td>82d C.I.F.</td>
<td>95.69¢ Bradford</td>
</tr>
<tr>
<td>Type 100</td>
<td>50s</td>
<td>B</td>
<td>75d &quot;</td>
<td>87-1/2¢ Yld.</td>
</tr>
<tr>
<td>Type 107</td>
<td>48/50s</td>
<td>B</td>
<td>73d &quot;</td>
<td>85.19¢</td>
</tr>
<tr>
<td>Type 114</td>
<td>46/50s</td>
<td>B</td>
<td>71d &quot;</td>
<td>82-7/8¢</td>
</tr>
<tr>
<td>Type 128</td>
<td>46/48s</td>
<td>B</td>
<td>73d &quot;</td>
<td>85.19¢</td>
</tr>
</tbody>
</table>

**B - GOOD/AVERAGE** - Good topmaking, fair to good color, skirted, may contain odd cott and/or very slight seed.

For comparison, prices in the closing sale at Wellington on May 3 were as follows:

<table>
<thead>
<tr>
<th>Type</th>
<th>50/56s</th>
<th>B</th>
<th>67d/68d</th>
<th>78-1/4¢-79-3/8¢</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 93</td>
<td>50/56s</td>
<td>B</td>
<td>60d</td>
<td>70¢</td>
</tr>
<tr>
<td>Type 100</td>
<td>50s</td>
<td>B</td>
<td>59d</td>
<td>68-7/8¢</td>
</tr>
<tr>
<td>Type 107</td>
<td>48/50s</td>
<td>B</td>
<td>57d</td>
<td>66-1/2¢</td>
</tr>
<tr>
<td>Type 114</td>
<td>46/50s</td>
<td>B</td>
<td>58d</td>
<td>67-5/8¢</td>
</tr>
</tbody>
</table>

Next Sale - WANGANUI - November 14th - 19,108 Bales
cheaper and the railroads will truck the shipment to the warehouse. The terms of shipment vary but the ultimate consumer must eventually pay the freight and handling charges. Terms on imported wool are usually C.I.F. clean basis landed Boston. All costs are included in the purchase price to the dealer. In most cases cost and freight are paid to the seller and insurance costs are deducted from the sale price. This is done because the dealer usually will carry a blanket marine insurance policy. At the time of leading on the ship the seller will telegraph the dealer as to place of departure, time of departure, and the name of the ship. When the dealer receives the necessary information he in return notifies his insurance company of time and place of departure, the name of the ship and its destination. The dealers usually will insure the shipment for loss and water damage at cost plus 10%. The ten percent is added for profit and expenses in case the shipment is lost.

C. Handling. All handling of the wool is done on a flat rate basis. When it arrives in Boston a public warehouse usually takes care of the handling and storing of the wool. At one time nearly all of the larger wool dealers handled the wool themselves. They had their own warehouses and did their own sorting. Today, however, sorting and handling are both done by others. There is only one warehouse in Boston today which still sorts wool for its customers.

The raw wool has to be scoured and sorted at some stage before it can be utilized for manufacturing. Some manufacturers like to sort their own wool; some like to scour their own wool, and some like to do both. These manufacturers although usually the large ones are definitely in the minority. Most wool manufacturers buy wool of a standard
grade that is secured. Dependent on where he plans to sell the wool the dealer may or may not have the wool sorted and secured. As a general rule the dealers usually have these operations performed in their wool. He may also contract to have the wool combed into tops if his customer calls for it.

The physical handling that the dealer is responsible for is done by the warehouse and the further processing necessary is done by specialized processors. These tasks have long ago passed from the hands of the dealer. However, he must still bear the costs.

D. Financing. The cost of handling, warehousing, further processing, plus the loss through shrinkage, and the cost of transportation to the manufacturer, plus the dealer’s operating expenses and a normal profit must all be computed by the dealer when he is contemplating the purchase of a given lot of wool. If after adding the sum of these costs to the purchase price he can still sell the wool for the total price then he will be inclined to buy the wool offered, if his capital is not tied up in other inventory.

In a typical transaction, the Boston agent of a New Zealand broker came to a dealer on Summer Street last April and offered him 100 bales (about 32,000 lbs.) of super half-bread lamb slipes, April length at 46½ pence (54¢) a pound F.O.B. New Zealand. The dealer's problem: Is this a favorable price, counting costs, and markup? Here is how he figures.

Freight plus handling charges bring the price per pound to 60¢ landed Boston in grease. Shrinkage is 25¢ or a clean cost of 80¢ a pound. A duty of 25¢ brings it up to $1.05 a pound.
Overhead including sales costs, office expense, and warehousing, is 5% or about 5¢ in this case. Figuring a clear profit of 2¢ a pound brings the sales price to $1.12. If the market will bear it, its a deal.

The dealer put up $16,600 through his Boston bank, he sends it as a letter of credit to the New Zealand broker. The broker gets his money as soon as he can certify that all the wool ordered is on board ship bound for Boston.

But the dealer doesn't see his money again until he sells the wool, probably not for six months. During the six months he is out $16,600 on this one deal alone and wide open to loss through drop in the market. His only protection is by means of a hedge in the wool futures market.$

2. Distribution:

A. Raw Wool to Market. The operations of the wool dealer may be broken down into three parts or tasks. They are: purchasing, office management, and sales. As the wholesaling company grows larger the line between these three operations becomes more distinct. In a one man business (he will usually be a street broker rather than a dealer) the principle must perform all three functions. With a three man business, two may act as full time salesmen, and the third manages the purchasing, the office and serves as a part time salesman. With a sixty employee company, the biggest in Boston, the lines of distinction are much finer. They may have a ten man outside sales force, a ten man inside sales force, three outside buyers located at primary markets, seven inside buyers and thirty office employees.

$ See section on hedging, Chapter 5.
For the wool dealer to buy wool, he must know the product he is buying, and the potential needs of his prospective customers, and for the wool dealer to sell wool he should know the product he is selling and to whom he is attempting to sell.

B. The Ultimate Consumer Market: In the year 1947 there were approximately 828 businesses primarily engaged in wool and hair manufacture in the United States. These comprise the principal market to which the wool dealers sold their product. These include knitting mills, carpet making mills, woolen mills, worsted mills, felting mills, top making and scouring plants. Each one of these mills require different types of wool and each individual mill varies in its requirements as to the fibre it uses and the quantity it uses.*

C. Selling Methods Used by the Wool Dealers: The selling task involved in the marketing of raw wool is a varied one.

Just as the woolen mills vary as to their raw material requirements, the wool dealers vary as to the type of wool he carries. Possibly six or eight of the largest wool houses in Boston and Philadelphia carry wool of all descriptions both domestic and foreign (roughly about 6,000 commodities).* The average wool dealer specializes in one particular branch (or range of fibres) of the wool business. One dealer may specialize only in domestic wools, his neighbor next door may handle only pulled wool; the house opposite may be the headquarters for certain South American wool, and in the basement below is a firm dealing only in Australian or Cape wool. One house may sell only scoured wools, noils and waste, while some only specialize in carpet wool.

*15, July 19, 1952.
Number And Location of Establishments In The U.S.
Engaged Primarily In Wool And Hair Mfg

Chart 10

W.A.M. Nov. 1952
<table>
<thead>
<tr>
<th>CUSTOMS DISTRICT</th>
<th>APPAREL</th>
<th>CARPET</th>
<th>OTHER ANIMAL FIBERS</th>
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</thead>
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<td></td>
<td>ACTUAL</td>
<td>CLEAN</td>
<td>VALUE (1,000)</td>
</tr>
<tr>
<td></td>
<td>WEIGHT</td>
<td>CONTENT</td>
<td>DOLLARS</td>
</tr>
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<td>BOSTON</td>
<td>293,800.3</td>
<td>174,314.6</td>
<td>221,572.5</td>
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<tr>
<td>PHILADELPHIA</td>
<td>34,455.3</td>
<td>21,699.9</td>
<td>19,237.1</td>
</tr>
<tr>
<td>NEW YORK</td>
<td>22,017.8</td>
<td>13,762.6</td>
<td>16,999.0</td>
</tr>
<tr>
<td>RHODE ISLAND</td>
<td>16,397.9</td>
<td>9,402.0</td>
<td>13,272.1</td>
</tr>
<tr>
<td>OHIO</td>
<td>13,123.7</td>
<td>7,871.0</td>
<td>8,900.5</td>
</tr>
<tr>
<td>PITTSBURGH</td>
<td>3,101.6</td>
<td>2,107.7</td>
<td>1,700.2</td>
</tr>
<tr>
<td>CHICAGO</td>
<td>1,056.8</td>
<td>662.6</td>
<td>737.4</td>
</tr>
<tr>
<td>NEW ORLEANS</td>
<td>795.4</td>
<td>457.2</td>
<td>423.3</td>
</tr>
<tr>
<td>TENNESSEE</td>
<td>843.0</td>
<td>528.8</td>
<td>365.0</td>
</tr>
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<td>OREGON</td>
<td>273.0</td>
<td>202.7</td>
<td>203.2</td>
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<td>N.C. CAROLINA</td>
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<td>250.9</td>
<td>179.3</td>
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<td>BUFFALO</td>
<td>605.4</td>
<td>400.3</td>
<td>331.3</td>
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<tr>
<td>GALVESTON</td>
<td>78.6</td>
<td>57.3</td>
<td>41.3</td>
</tr>
<tr>
<td>CONNECTICUT</td>
<td>523.1</td>
<td>221.4</td>
<td>280.5</td>
</tr>
<tr>
<td>ROCHESTER</td>
<td>174.9</td>
<td>103.5</td>
<td>83.5</td>
</tr>
<tr>
<td>WASHINGTON</td>
<td>143.3</td>
<td>117.2</td>
<td>83.5</td>
</tr>
<tr>
<td>S.C. CAROLINA</td>
<td>48.6</td>
<td>7.9</td>
<td>36.0</td>
</tr>
<tr>
<td>MINNESOTA</td>
<td>26.3</td>
<td>15.9</td>
<td>21.0</td>
</tr>
<tr>
<td>VIRGINIA</td>
<td>12.8</td>
<td>7.9</td>
<td>8.4</td>
</tr>
<tr>
<td>FLORIDA</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>COLORADO</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ST. LAWRENCE</td>
<td>34.0</td>
<td>17.1</td>
<td>13.9</td>
</tr>
<tr>
<td>SAN FRANCISCO</td>
<td>295.7</td>
<td>171.1</td>
<td>196.2</td>
</tr>
<tr>
<td>VERMONT</td>
<td>123.3</td>
<td>100.9</td>
<td>144.2</td>
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<td>MICHIGAN</td>
<td>50.0</td>
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<td>MAINE &amp; N.H.</td>
<td>276.5</td>
<td>152.4</td>
<td>224.5</td>
</tr>
<tr>
<td>LAREDO</td>
<td>62.3</td>
<td>26.7</td>
<td>31.0</td>
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<tr>
<td>EL PASO</td>
<td>19.9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>LOS ANGELES</td>
<td>24.9</td>
<td>21.2</td>
<td>18.9</td>
</tr>
</tbody>
</table>

| TOTALS           | 388,719.9 | 232,721.8 | 285,044.5 | 346,306.0 | 236,966.8 | 162,838.9 | 13,017.2 | 9,752.4 | 10,696.4 |
The task of the dealer to locate the customers for his particular line is a relatively simple one. Every year a complete listing of all establishments engaged in any way with the wool trade is published. With the aid of this listing and a moderate amount of research a list of the dealer's potential customers can readily be constructed. From this and through experience a schedule of frequency of calls, salesman routes both slow and express can be compiled by the dealer in order to cover adequately his own market.

The small dealers with limited capital and limited sales force tend to try to skim the cream from the market for their particular line. As the dealers grow larger, they spread their prospective market by taking on more lines. They reach a point, however, where a deeper vertical penetration of the market is necessary. Somewhere along the line after reaching this point of forced vertical penetration, they should reach a point of diminishing returns due to dealing with small customers or marginal accounts. This may explain in part the relative lack of large dealers carrying a complete line. Another reason may be a lack of capital. The integrity of the salesman and the dealer he represents must first be fixed in the mind of the mill buyer. The successful wool salesman is the one who is friendly with his customers. Personal relations between the buyer and the salesmen are very important. These relations will not result in favoritism to any great extent on the part of the mill buyer; rather, he has a choice, the type of wool and the price being equal, in making his choice the buyer will naturally lean toward his friends. This was explained to this writer by a salesman connected with one of the largest wool house in Boston. He put it this way, "On
many occasions the mill buyer will find five or six salesmen in his office all trying to sell him the same general type of wool at the same price. From which one will he buy? This situation does not occur too frequently but it does occur often enough to make a noticeable difference in earnings to the man who maintains the friendly relationship with his customers.

Selling wool is different from selling many other products. When you sell most other products, your prospective customer usually does not want your product or has to be convinced that it is necessary. Facts have to be placed before him in such a way that he has to be "sold" on the idea. In the case of wool your customer needs the product, he is in the market and will buy as needed, not before. Price and quality are the principal factors, and being equal in some cases between competing houses, the orders will go to the house and to its representative whose personal relations have been the best.

The mill buyer of wool knows what he wants. High pressure methods or very aggressive selling would result more in irritation to him than anything else. He wants to know the estimated shrinkage, grade and length of fibre (this becomes obvious to him from the sample), the section of the country or the world at which this particular wool originated, and of course the price. Many times it is not a good idea for the seller to advance his estimate of the shrinkage unless the buyer should ask for it because the buyer may estimate it as one or two per cent lighter than the seller's estimate. #

# According to Mr. McGuigan, Purchasing Agent, Libby Woolen Mills.
Number and location of establishments in United States, engaged primarily in wool and hair manufacturing, 1947:

<table>
<thead>
<tr>
<th>United States</th>
<th>Scouring and Combing</th>
<th>Spinning</th>
<th>Winding Twisting</th>
<th>Weaving</th>
<th>Dyeing and Finishing</th>
<th>Total</th>
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<td>Weaving</td>
<td>Dyeing and Finishing</td>
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<td>—</td>
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</tr>
<tr>
<td>Vermont</td>
<td>—</td>
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<td>14</td>
<td>—</td>
<td>15</td>
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<td>—</td>
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</tr>
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<td>—</td>
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<td>9</td>
<td>2</td>
<td>16</td>
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### Chart 13

**WOOL YIELD OF U. S.**

Estimates of domestic clips from 1928 by the U. S. Dept. of Agriculture in pounds are:

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<th>Year</th>
<th>Shorn</th>
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<td>1929</td>
<td>327,795,000</td>
<td>54,900,000</td>
</tr>
<tr>
<td>1930</td>
<td>352,129,000</td>
<td>61,900,000</td>
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<td>1931</td>
<td>376,301,000</td>
<td>66,100,000</td>
</tr>
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<td>1932</td>
<td>350,996,000</td>
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</tr>
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<td>374,132,000</td>
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<td>368,860,000</td>
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</tr>
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<td>1935</td>
<td>361,531,000</td>
<td>66,000,000</td>
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<td>1936</td>
<td>353,211,000</td>
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<td>356,076,000</td>
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<td>*1951</td>
<td>229,111,000</td>
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*Preliminary*
Most wool is originally sold on sample. In some cases a certain type of wool has become almost standard and may be sold on description alone, as in the case of re-orders from a particular lot. However, as a general rule, it is safe to say that the majority of the dealers' sales will be by sample.

Samples should always accurately represent the clip. A five pound sample may represent a million pounds of wool. This condition makes it necessary for the mill buyer to have confidence in the word of the seller and the accuracy of his sample. If the dealer should misrepresent his wool by means of an irregular sample, he will soon find it impossible to sell a single pound of wool. This fact causes many salesmen to prefer drawing their own samples. When they are on the road, they must constantly be supplied with samples by mail.

The samples to represent the fleece are usually drawn from the shoulder and body parts of the fleece. Grease wool samples are wrapped in brown kraft paper about 2½" x 10". The reason for the brown paper is that it shows grease wool to its best advantage. As the sample roll is opened the paper becomes a background on which the sample is viewed. Scoured wools, noils, waste and mohair are rolled in blue paper. This provides the best background to show these lighter colored wools. The samples weigh about one pound. They are the salesman's chief selling tool aside from his knowledge of his customer and his product. Samples make possible a visual display of the goods the salesman has to sell.

The mills serviced by the wool wholesaler will usually make several lines of fabric. In addition to this they produce by season.
Clothing mills have two seasons, a light or spring style line of fabrics and a heavy or fall style line. Fashion also exerts a heavy influence on the type of line to be produced in any given season. Because of the style factor seasonal trends, and in some cases capital restrictions, the mill usually will buy only for short intervals ahead. All but a few of the very large mills prefer to buy raw wool for just a few weeks ahead. One cause for this is that the mill owners and buyers for the most part have learned that it does not pay for them to speculate with large inventories. There are too many factors operating against them. Price fluctuations, style changes, seasonal changes, labor trouble, cyclical, and even episodic changes in the wool market, make inventory speculation a highly dangerous method of operation.

The mills buy frequently in relatively small lots. The salesmen, because of this, prefer to call on their customers regularly once a week. The nature of the customer may vary this routine, but that is the usual procedure employed by salesmen. The calls are made the same day each week and as near to the same hour as possible. In this way the mill buyer knows when to expect each salesman so that he can plan his time, and at the same time, he can delay purchasing until he has spoken to the salesman he wants to speak to. This gives the buyer a chance to plan and to compare prices and quality before he makes his final decision. This procedure also makes it easier to understand why such good relations exist between the salesman and his customer. A visit once a week for several years is enough time for them to become good friends or mortal enemies as the case may be.
In the winter to save on water and electricity, the deep water

will be turned off, and the water in the hot water tank will be reduced. This will save on water and electricity.

Additionally, the water in the washing machines will be turned off, and the water in the hot water tanks will be reduced. This will save on water and electricity.

Furthermore, the water in the hot water tanks will be reduced. This will save on water and electricity.

In the summer to save on water and electricity, the deep water

will be turned on, and the water in the hot water tank will be increased. This will save on water and electricity.

Additionally, the water in the washing machines will be turned on, and the water in the hot water tanks will be increased. This will save on water and electricity.

Furthermore, the water in the hot water tanks will be increased. This will save on water and electricity.
tains a display room. There he has large samples from which smaller
samples can be drawn to be sent to his sales force. There he can attrac-
tively display his goods to visiting mill buyers, street brokers, and
to other dealers who may be in the market for his goods.

In the show room baled raw wool is arranged in small piles to
give the fibre a chance to expand and return to its natural softness
which is destroyed by the pressure of baling. Scoured noils and waste
wools need no such care; samples are usually kept in boxes, about five
pounds in each. These light wools when displayed are set out on benches
of light blue or gray. The grease wool is displayed on unfinished oak
benches so that the wool will be shown at its best advantage. Many
sales are made in these show rooms, but once again there is a notice-
able lack of aggressive selling. The buyer knows what he wants; if
you have the goods at the right price, the sale is yours.

In conclusion to this section on selling wool let us quote
the words of Mr. Robert Hurley, a wool dealer in the Boston market.
"Sales are made when the right product is offered at the right place
at the right time by the right person."

Transportation and Terms of Sale: Practically all wool sold
in the Boston market is shipped by truck to the buyer. Over sixty per
cent of the wool consuming mills are located within the New England
area, and the wool can be trucked directly from the sellers' warehouse
to the buyers' warehouse sometimes in a matter of hours.

The terms of sale between a mill buyer and the wholesaler
vary. Standard terms are 30 days net and sometimes 60 days net, both
are usually at warehouse. These terms seem rather odd especially when
we find that the terms between dealers is 1%, 10 days. The only conclusion we can draw from the information is that the salesmen know their customers so well they do not need to offer a discount for prompt payments. They pare their price to the bone in order to compete against each other. These terms depend on the buyer and the seller and the market conditions at the time of sale.

As to the questions as to who pays the freight, it is understood that the cost of freight is to be passed on to the mill; hence the mills would rather pay it directly and arrange for the transportation of the wool themselves. In some cases when the wool is still in bond, it is sold "X warehouse in bond". This means the buyer pays both the freight and the tariff fee necessary to release the wool from bond.

The wool may be shipped immediately to the buyer, or if it is in transit to the wholesaler, it can be shipped on arrival or the destination changed so that the goods will go directly to the mill. In some cases where the mill is stocked to capacity or there is some prepaid time in the warehouse yet to elapse, the mill buyer will specify that the wool be shipped in total or in parts at some future named date or dates.

2. **Wool Brokers:** Besides the wool wholesaler or dealer there are several types of brokers who play a prominent part in the marketing of raw wool. These brokers can be classified into two types, Foreign and Domestic.

Foreign and domestic brokers operate very much alike. We cannot strictly classify the broker as a wholesaler because at no time
during the transaction does he take title to the goods. The broker is a catalyst in the wool wholesaling business, but he is not, in the strict sense of the word, a wholesaler himself. He acts as a sales representative for people who own wool at the primary markets. The foreign wool broker will deal in wool of a particular type as agent for firms in New Zealand, South Africa, Australia and England and other primary markets. The usual method is to represent one firm in each market. The foreign broker usually does the bulk of his business during the months from November to May at which time the wool auctions of the world are most active. During this active period the brokerage sales are made to dealers and to some large mills. During World War II the demand for wool rose to amazing heights\(^9\), (from 600 million to a billion lbs. per year). In the scramble to get wool, some of the large mills started the practice of buying their wool directly through the brokers. Previous to this time brokers sold exclusively to dealers as the mills preferred to buy from dealers. In the off season when the wool auctions are closed, these mills will again turn to the dealer, who carries an inventory at all times for their wool requirements.

The method of operation by a wool broker is relatively simple. He receives offerings of wool from the people he represents. The broker then will inform his customers, or those he thinks might be interested in such an offer. He may send out a mimeographed sheet, he may telephone to his prospects, or he may call in person to inform them of what he has to offer that in which he thinks he might be interested. The offer may be refused, it may be reserved (held for that particular buyer for the rest of the day while he makes up his mind), or it may be

Mr. Fowler, wool editor of the Commercial Bulletin.
accepted. The prospective buyer may offer to take the lot for a lower price. In any event, except that of outright refusal, the broker will telegraph back to the primary market to affirm the sale, to quote the price offered, or to ask that a particular lot of wool be reserved. The sale is consummated by a letter or telegram of acceptance from the dealer at the primary market. The buyer then goes to his bank and opens a letter of credit which is sent to the seller, who cannot cash it until the wool is on board ship. At this time a cable of confirmation is sent to the buyer naming the ship the wool is being shipped on, and the time and date of departure. The terms are usually C.I.F. Boston or the specified port of arrival.

The broker acts as a commission merchant and collects 1½% of the purchase price as his fee. The domestic broker operates in much the same way although the wool may be shipped to Boston in consignment to him. He collects between 1% and 1½% as his fee.

3. The street broker deals in almost all types of wool. He usually sells wool between dealers. He will usually operate on a one per cent commission basis. The commission broker will handle odd lots, wastes, and generally anything the wool dealer cannot, or does not wish to sell to his other customers. If the dealer has a buyer for a particular grade of wool and he must have a lot of raw wool fleeces graded in order to get the particular grade to be sold, he is left with the off grades. If his customers cannot use these off grades, he will use a street broker to sell them. The street broker will take samples of the lot and go out and call on the other dealers in the Boston market. The seller usually asks more than he expects to get for the lot of wool, and the buyer will offer less than he expects to pay for the lot.
The price is finally set and the terms of the sale are settled through the medium of the street broker. The dealer may need small lots of an off grade of wool. He will contact the street broker who will go out and circulate along Summer Street to locate the wool. The street broker is not a wholesaler; he is a commission merchant who is a most necessary adjunct to the wool market.

4. The Boston Wool Trade Association. Almost all members of the wool marketing trade in Boston are members of the Wool Trade Association of Boston. The Association has listed as members 400 firms and their employees, including some 100 women. The Wool Trade Association is a social and technical organization. Members of the wool trade are a close knit group. For the most part they all know each other and have a great respect for one another. The Boston Wool Trade Association brings its members closer together so that they can exchange ideas and knowledge. The Association also serves as a mediator in disputes between dealers through the medium of its arbitration committees. It publishes a periodical, price lists, and other pertinent data. It attempts to keep a finger on the pulse of the wool market for its members. It maintains a traffic department which keeps track of shipping for the convenience of members. It has a wool waste committee and many other committees which try to analyze the market and aid members dealing in that market.

Your author would like to take a few minutes here to express his high regard for the members of the Boston Wool Trade. During his investigation of the wool trade he was met with the utmost courtesy. All whom he approached in his search for information were more than
pleased to put themselves out in order to place the facts before him. The members of the Boston Wool Trade, through their honesty and integrity, have earned themselves a great regard not only from your author but from all who have dealings with them. To give an example of the confidence placed in them, we cite the policy of the Boston banks toward the wool trade. All banks follow about the same extraordinarily liberal lending formula toward the members of the wool trade. They will loan up to three times a dealer's working capital. Very few trades have earned that kind of confidence. Confidence comes from the high code of ethics that extends all through the street. Word of mouth is as good as a signed contract, for that is the way most orders are placed.
CHAPTER V
PROBLEMS OF THE WHOLESALER

A. The Raw Wool Tariff.

1. The tariff as it is today: The wool wholesaler in Boston must pay a duty on foreign wool levied by the United States customs. The tariff act of 1930, called the Hawley-Smoot Tariff Bill, is now in force. Wool schedule No. 11 of this act, states in paragraph 1102:

"Wools, not especially provided for, and hair of the Angora goat, Cashmere goat, Alpaca and other like animals, in the grease or washed, 3½ cents per pound of clean content: scoured, 37 cents per pound of clean content: on skin, 32 cents per pound of clean content: sorted, or matchings, if not scoured, 35 cents per pound of clean content."

This means that wools for the use of worsted or woolen manufacture must pay a duty of 3½ cents, based on the yield of scoured content. In other words, if the imported wools are estimated to shrink 50%, yield of scoured wool must pay a duty of 3½ cents a pound. If we imported 100,000 pounds of a foreign wool in the grease, shrinking 50%, we therefore would pay to the government 17 cents per pound in the grease. To find the duty on grease wool we multiply the yield by 3½ cents.

Owing to the fact that in this country we raise but little wool for carpet purposes, wools for the manufacturing of carpets and floor coverings are admitted free. These wools must not be finer than a 40's which is about the grade of our common wool.

Wools are entered at the customs on an estimated yield. The appraiser opens up sample bales and examines the wool to see if the estimated yield as entered is correct. If the wool is desired for im-
mediate consumption or is held and owned by a wool dealer for resale, the wool is taken from the pier and stored in a bonded warehouse in charge of a custom's official. Samples may be drawn from the bales, but only upon payment of duty, and a permit must be obtained from the custom official who is stationed at the bonded warehouse where the wool is in store.

Three years are allowed the owner to keep his wool in bond without paying the prescribed duty. If at the end of the three years the wool has not been withdrawn, he must withdraw it and pay the duty. The owner can, by applying to the custom house officials, receive an extension if the officials agree that the reasons for the application warrant it. In some cases local dealers may purchase foreign wools, store them in bond in this country, and sell them abroad. They therefore re-ship the wools to London or elsewhere, directly from the bonded warehouses without paying the duty.

In purchasing foreign wools, the duty must be taken into consideration to see that the out-of-bond price does not exceed the price on which similar wool grown in this country can be bought. Many mills, making specialties which require a foreign wool, are willing to pay this additional figure over the price at which a domestic wool of similar grade can be purchased.

2. The case against the raw wool tariff: Since domestic consumption of apparel wool is larger than domestic production of wool in most years, this country has to import substantial amounts of foreign apparel wool in many years. The insufficiency of the supplies of domestic wool relative to the consumer demand for it in many years, together
with the tariff on imports of foreign apparel wool, results in the fact that prices of domestic wool in this country average considerably higher than prices of comparable qualities of foreign apparel wool abroad. However, as may be readily seen in price records, domestic prices of domestic wool have not, on an average over a period of years, exceeded foreign prices of foreign apparel wool, even taking foreign prices in an unskirted basis by the full amount of the tariff. This is because the tariff is partially non-effective in raising prices in times when domestic supplies of apparel wool are so large or domestic consumption of apparel wool is so small that supplies exceed requirements for consumption. These conditions have been unknown in the last twenty years. The main reason that domestic wool will not sell at cost plus tariff price of foreign wool is that wool manufacturers are willing to pay an average of 9¢ per pound higher for foreign wool for an equivalent amount of domestic wool. "This 9¢", according to "The Wool Digest", represents the premium that domestic mills are willing to pay for the better preparation and smaller shrinkage of imported wools.*

At the time of its inception the Hawley-Smoot tariff was designed as a protective tariff. It protected the wool manufacturers and the wool growers of the United States from foreign competition. Today this tariff has ceased to protect the wool grower because all but a few raise sheep for the meat they produce, the wool being secondary. Because of the increase of population, the demand for wool goods, and the shift in emphasis by the sheep grower from wool to meat, 75% of the raw wool purchased for manufacture by the fabricaters in this country

*Wool Digest January 15, 1948
has its origin in Australia, New Zealand or the Union of South Africa.*

Until World War II the tariff benefited approximately 10,000 sheep growers who rely upon their flocks as their main source of income; these large scale producers gained by the tariff. At the same time the more than 489,000 marginal producers with an average of 25 animals profited by as much as 20 dollars per year. The tariff obviously did not hurt them nor did it help them a great deal because the amount of rise in wool price brought about by the tariff was for the most part inconsequential to them.

Since 1941, however, the 3½ cents duty paid shrunk too insignificantly in the case of the large producer and may have lost income for the several hundred thousand small producers. The price of both foreign and domestic wool has risen steeply since 1940. For example, the average price of domestic apparel wool rose from 82.7 cents in 1939 to $1.25 in November 1947, an increase of 42 cents per pound; foreign wool prices during the same period rose from 86.5 cents to $1.60, an increase of 72.5 cents. The 3½ cents differential of 1930 clearly is no longer valid. During the war the government was forced to subsidize the domestic grower both to help him meet higher production costs and to encourage him to produce more wool. As more and more wool flowed into this country, the duty lost most of its value as protection. Even the largest grower became aware of the fundamental truth governing wool imports: They were increasing, not because foreign wool prices were lower, but because they were needed to fill a demand that domestic production could not satisfy. Thus during the war the duty no longer affected the domestic grower’s price, since

*30, P. 1-5
price was no longer essential in the wool market.

Since the end of the war, price once more has become the determining factor in the purchase of wool. However, as wool prices continue to climb, and as demand is still centered about high grade wools, the 3½ cent duty has become steadily smaller to the grower. Today a subsidy accomplishes what the tariff was designed to do. The subsidy enables the grower profitably to furnish wool at a competitive price while the tariff serves principally to raise the cost on 70% of all wool consumed by 25 cents.

In the Agricultural Act of 1949, the level of support of wool was set at 90% of March 15 parity, beginning with the 1950 clip. This means that the commodity credit corporation is empowered to purchase our domestic wool clip in order to maintain the 90% of parity or 95.4 cents per pound as set by the Federal Government.*

In May 1951, Ceiling Price Regulation 35 set a ceiling price on all raw wool for sellers other than growers. These price ceilings were later revised downward by as much as twenty per cent.**

From the above information it becomes apparent that the protective tariff of 1930 is no longer necessary; prices are pegged from going above a ceiling and from going below a minimum by other legislation. What, then, is the result of this tariff law which is still on the books? The result, plain and simple, is that wool in any form is costing every man, woman and child in the United States 25.5 cents per pound more than it should (as of Jan. 1, 1948).

However, this wool duty cost, which theoretically provides exactly its total sum in revenue, was only a small part of the bill to

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*30, P. 3
**30, P. 4
the American public. Wool is a raw material consumed in manufacture of a finished product. Each step in the total manufacturing process involves a manufacturers' markup, which prior to the demise of the original O.P.A. averaged 40% for the wool textile industry.* Thus raw wool may go through four, six or eight different stages of production until it reaches consumer commodity form, and in one the 25.5 cents duty is compounded. The final cost to the consumer who averaged 4.4 pounds of wool purchased per year and who, in aggregate, purchases between 5 and 6 billion dollars worth of wool products per year, is thus many times the original 25.5 cents per pound. The total expense to all consumers resulting from the marked-up 25.5 cents per pound, is unobtainable; however, it may well exceed a billion dollars per year plus the initial cost of the tariff, $822,000,000 in 1946. The situation is a rather ridiculous one in that the coalition of wool growers and wool manufacturers was directly responsible for the inception of the tariff in question; they secured the law by means of a powerful lobby. The tariff is no longer of any value to them; however, the American taxpayer and wool buyer has no powerful lobby to rectify this situation. The wool tariff has become an additional source of revenue to the federal government, a tax on wool. If the price of wool could be reduced 25.5 cents per pound, it would be to the mutual advantage of all concerned, in that more wool goods could be sold, and the buyer would receive more value for his wool dollar.

3. A possible solution to the raw wool tariff question. The answer is simple. Natural curiosity led to a more thorough examination to verify first impressions. Once that was done, a solution which would lie within the scope of this thesis presented itself. The study conducted by the 20th Century Funds tried to answer the question: Does distribution cost too much? Here is a situation where the middle man can make an appreciative reduction in price. The wool wholesaler is the contact man of both the sheep herder and the textile mill. The middle man with the knowledge of the situation could on his rounds spread the information, and eventually when the true situation came to light, the same pressure group who put through a perfectly legitimate protective tariff could cause the repeal of the Raw Wool Section of this tariff act that has ceased its proper function.

As this analysis of the tariff act is being written, the Department of Agriculture of the United States Government is in the process of attempting to raise the tariff on raw apparel wool 12½ cents per pound higher than it is at present. This again is to protect the industry that, in the words of the Senate committee investigating the situation, will not be able to supply all our domestic apparel wool needs for at least 100 years.

If the Department of Agriculture finds it absolutely necessary to support the price of less than 30% of our raw wool supply, why must they accomplish it in such a way that the American public must bear the artificial price increase on 100% of our raw wool supply? It is the consumer who must ultimately bear the cost whatever method used to support the price of raw wool. Would it not be more equitable and
more consistent with democratic principles to allow the world wool market to set the price of raw wool and subsidize the domestic wool grower directly? In this way the wool price could be maintained at the desired level for our domestic production, and yet the ultimate consumer would appreciate a price reduction by the amount of the tariff on over 70% of the raw wool used for domestic consumption.

The condition forced on the manufacturers of wool products by the tariff, as it now stands, presents an even greater problem. In case of war we would be forced to rely heavily on foreign imports of wool to meet our military needs, even if not one ounce of wool were allocated to civilian consumption. If the sea lanes to the source of the wool supply were closed, our nation would be in a most difficult position. The government is stockpiling wool, however, this reserve would not last long. In attempting to maintain a price that bears popular appeal, the manufacturer is forced to use synthetic fibre substitutes for wool to avoid the artificially high price of raw wool dictated by our tariff policy. The net result is that in attempting to increase wool production by maintaining a high raw wool tariff, we are destroying the wool market and encouraging inefficient and unscientific wool production. The primary factor in the growing of sheep in the United States does not lie with the wool produced by the animal, but rather by the price of mutton. In other words, support of the price of raw wool does little more than give an additional bonus to the mutton producer and tax the American consumer on every pound of wool used in domestic production, when it would serve the same purpose to tax him on only 30% of our wool consumption.
As it has been shown, the situation surrounding the wool industry in this country is in a deplorable condition. Something can be done to encourage the use of wool in fabrics rather than to discourage it. This can be done by the wool industry itself if the dealers could get solidly behind the trade association representing them. It is their business; they are the experts who understand the situation; the solution lies in their hands.

B. The Tops and Raw Wool Futures Market.

1. Introduction: As futures trading in wool top and grease wool have influenced to an increasingly greater extent the marketing of wool, this section will be devoted to the study of this market.

Trading upon organised commodity exchanges is conducted through the use of futures contracts. These contracts are highly standardised in form and are interchangeable one with another so that buyers and sellers can enter or leave the market without difficulty at any time. They call for delivery at a later date, frequently several months hence. Being interchangeable, one with another, they are usually not allowed to mature into actual delivery; rather they are offset by traders to realise a profit or a re-converted into the actual commodity. This possibility holds their price in substantial alignment with spot prices. It is for this reason that futures trading and future prices assume public importance. The trade in futures contracts is of sufficient magnitude to exercise at all times a directing influence upon spot prices in central as well as local markets.*

*From booklet "Trading in Commodity Futures", by the Commodity Exchange Administration, United States Dept. of Agriculture.
A second important function of these markets is that of hedging or price insurance. The futures trading system is utilized by merchants, processors, and distributors as a means of reducing the risk of price fluctuations. They are interested only in their expected profits from processing, handling, or distributing the actual physical commodity. Through the use of futures transactions, they transfer the risk of price change to the shoulders of speculators who desire to assume the risk in hope of securing a profit from price changes.

Commodity futures transactions of the public are executed on contract markets through the future commission merchants and floor brokers. Futures commission merchants are firms or individuals who solicit and accept orders for future contracts, while floor brokers are individuals who actually execute orders in the ring of an exchange.

The relationship of a futures commission merchant to his customer is one of agency from the beginning to the end of each transaction. As agent, the commission merchant can have no interest in the results, profits or accruals from the contracts of his customer beyond the collection of commissions, interest, taxes, storage, and other charges. Futures commission merchants are also required to treat all money, securities, and property received from customers to margin guarantee or secure customer's trades as belonging to such customers. The law prohibits the use of such property to margin the trades of or to extend credit to any other person.

Futures trading consists of two broad type of activities: assuming risk as speculators or shifting risk as hedgers.

"Hedging" refers to the practice of making contract sales and
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prices
in two markets move exactly parallel, losses from price changes
in one market will be offset by profits in the other. When so made,
futures trading provides a form of insurance in which the body of the
speculators constitute the insurers, and the body of the hedgers, the
insured. Hedging differs from insurance, however, in that the hedger
not only holds the original risk of price fluctuations, but he takes
on another risk as nearly as possible opposits so that loss on one
will be offset by gain from the other.

The value of hedging lies in its ability to conserve mer-
chandising profits in individual transactions and provide protection
against unusual losses. It has been found especially useful in the
grain and cotton trade. It is estimated that cotton futures contracts
are used as hedges by cotton merchants and manufacturers against 70% of the American cotton crop.*

2. Mechanics of the Market: As far back as 1890, the rec-
ords show that the New York Cotton Exchange had been considering the
establishment of a market in wool futures. Not until 1931 were the
rules and regulations of a wool exchange passed by the members of the
New York Cotton Exchange; trading in the contract for the delivery of
wool tops was inaugurated on May 18 of that year.

At the time the New York Exchange was opened, trading on
wool top futures were being carried on in both Antwerp and Roubaix-
Tourcoing. The Exchange at Antwerp, Belgium was established in 1887.
This market has operated continuously with the exception of its closing

*6, P. 50-150.
in 1914 and again in 1939 due to wars. The secession of hostilities has always seen the reopening of the market.

The Exchange at Roubaix-Tourcoing was opened in 1888 and continued in operation until the beginning of World War I; the exchange reopened in 1922. Again in 1939 it was closed but was reopened after the secession of hostilities. This French market is rather odd in that morning sessions are held at Roubaix and afternoon sessions in Tourcoing.

The New York Wool Top Exchange, founded under the sponsorship of the New York Cotton Exchange, consists of two types of membership, class A and class B. Class A members, who automatically consist of members of the cotton exchange, have full advantages of membership which include one-half of the commission rates charged to non-members; the privilege of trading on the floor of the exchange and becoming members of the clearing association who clear trades through the association. Class B members are not members of the New York Cotton Exchange. While they have the benefit of reduced commission rates on wool top futures, they do not have floor trading privileges, nor may they become members of the clearing association.

Futures trading on the New York Wool Top Exchange calls for the delivery of 5,000 pounds of wool tops, net condition weight. This weight is the actual net weight adjusted to include the equivalent of 3% of oil and natural fat and 15% moisture. The so-called wool top exchange standard is defined as follows: "An American fine wool top conforming to grade 64s, official United States standards for wool top, made out of Merino wools, oil combed, and containing a normal percentage of 3% of oil, including natural fat, produced from wool
grown and shorn from living animals in the United States, cleaned, scoured, carded and combed in accordance with the methods and usages prevailing in the industry, and of average length and color."

Tops of the above description are deliverable on future contracts at contract price. Tops of better grade and length may be delivered at a premium and those of a poorer quality at a discount. Tops made from certain foreign wools, if conforming in grade and other qualifications, are deliverable on a contract. Wool tops to be delivered must be certificated by official inspectors. The exchange issues certificates for all lots of top passed by the inspectors and are called "certificated tops".

The buyers of futures contracts are called "longs" and are said to have a "long" position. The traders on the other side of the market, the sellers of futures contracts, are called "shorts" and having a "short" position. The longs anticipate a rise in price for the future contract so that they may sell at a profit, thus liquidating their original purchase or commitment. The shorts anticipate a lower price so that they may secure a profit by buying back their contract at less money than the purchase price as well as liquidating their position.

When selling cloth, yarns or wool and hedging sales or purchases on the New York Wool Top, or Grease Wool Exchanges, wherein you contract to purchase or sell a given amount of top, or raw wool you must figure the difference in price between your manufactured product or the raw material with the price of the semi-manufactured product of top or grease wool, whichever is the commodity traded on the futures
The term basis, in any commodity trade in which the term is used, means the spread between the price of a given lot of the commodity at any location in the trade at any given time and the simultaneous price of a futures contract on a futures exchange in that trade, which contract is, or may be, used for hedging such commodity. The spread between the price of any given lot of wool or wool product and the simultaneous price of any given future delivery on the exchange is the basis on that lot in terms of that future delivery.

In the early days of the formation of the top futures market, much time was spent to determine whether the futures contract should cover grease wool or the partly manufactured product in the form of top. The final decision was reached to trade the top contract due to the fact that it was believed that top was much easier to appraise than grease wool. As the interest in futures trading in wool top spread to many cross sections of the trade, the question of a grease wool contract was again discussed. It was felt that more wool dealers, manufacturers and especially the wool growers could understand the ramifications of a grease wool contract, possibly better than the present top contract. Also, a grease wool contract would avoid a congested situation in top combing space, such as occurred in the latter part of 1940 and 1941, preventing traders from having wool combed into top for delivery on the exchange. A grease wool contract would therefore act as a safer hedge. One official of a large wool growers' cooperative association publicly stated that: "The adoption of a grease wool futures contract and the inauguration of trading in grease wool futures makes available to the wool grower and the wool grower's cooperative marketing organi-
sations a futures market for raw wool which has for all practical purposes, not been available to them in the past. In all probability, it will be easier to work out a basis between grades of wool and the grease wool standard than the basis between grades of wool and the wool top futures standard.

During the last six months of 1939 and during the year of 1940, a committee looked into the feasibility of a grease wool contract. They reported favorably to the governors of the New York Cotton Exchange, and an enlarged committee was formed to draw up a suggested grease wool contract. This committee consisted of representatives of the wool growers, wool dealers, top makers, and the woolen and worsted manufacturers. The contract was approved and trading in grease wool futures commenced on the floor of the New York Cotton Exchange at noon on March 17, 1941.

The grease wool contract calls for the delivery of the grease equivalent of 6,000 pounds of clean wool with a 64s quality graded wool shorn from living animals in the United States as the basis, and with other qualities of domestic and foreign wool tenderable at proper differences. Delivery is to be from approved warehouses in the Boston metropolitan district. As in wool tops, grease wool price changes are in multiples of one-tenth of one cent a pound. One-tenth of one cent in wool top is equivalent to $5.00 on a single contract, and a cent fluctuation is equal to $50.00 on a contract. On a grease wool contract one-tenth of one cent is equal to $6.00 on a contract and a full one cent to $60.00 per contract. Futures trading on grease wool is more active during the months of May, June, July, August, September and October, while trading on wool tops is most active during the months of
March, May, July, October and December.

In the grease wool contract, trading prices are based on the clean value of the wool. Thus, if the December contract is traded at 96 cents, it means that a trade has been made on 6,000 pounds of clean wool, after the dirt grease and other factors have been removed from the grease or shorn wool in the process of scouring. Therefore, if this particular trade goes through for delivery, and the wool in the grease has been certified to shrink 66%, the deliverer sends to the purchaser about 18,000 pounds of wool in the grease. The seller may deliver on the Exchange wool certificated by the inspector up to 6% superior to the grease wool standard. Wool more than 6% superior may be delivered but shall receive the maximum premium of 6%. Wool inferior by more than 6% is not certificated nor tenderable.

3. The Value of the Wool Futures Market to the Wool Dealers.

a. Dealer's problems in merchandising wool: The wool dealer, broadly speaking, must buy wool when the growers wish to sell it or when the dealers think the price is right. He must carry the wool until consumers are ready to purchase from him. Consumers look to him to have a large well-assorted stock, and expect him to make offerings to them at all times except in periods of absolute scarcity. He must offer wool in such qualities and quantities as consumers demand; hence, he must grade the wool that he receives so far as grading is necessary to meet the needs of his consumers. In doing this, the dealer must take the risk of being left with the unwanted grades.

Since prices of wool fluctuate greatly, the dealer's costs, as represented by the prices which he pays to growers, vary greatly;
and his receipts, as represented by the price which he can obtain from
the consumers, are likewise subject to wide changes.

The wool dealer must buy much of his supply of raw wool on
foreign markets in which delivery may not be made for a period of
2 or 3 months. The dealer is finding it increasingly more necessary
to guard against price shifts during this transportation period.

The wool wholesaler usually operates by carrying an inven-
tory from which he makes his sales. He wants price protection on this
inventory, for many times it represents a much larger investment than
his capital alone; a drastic price swing could ruin him. It becomes
obvious that the dealer must incur exceptionally large risks of loss
from price changes on wool which he merchandises for his own account.

b. Why many dealers hedge their operations: Most of the
wool dealers who conduct their business on the hedging principle adopt
hedging chiefly because they realize that they are engaged in a highly
speculative business in operating on the non-hedging principle. Not a
few of them have had the experience of making large profits in seasons
when they judged the future course of wool prices correctly and of tak-
ing large losses in other seasons when their judgment was wrong. They
have found that taxes took a large portion of the profits realized in
profitable years, while they have had to shoulder the full losses in-
curred in unprofitable years. They have seen many houses, including
some of the largest, best financed, and best conducted, withdraw from
the trade, either because of loss of capital or because of unwilling-
ness to risk their capital further. They have found in hedging a
possible way of putting their business on a relatively safe and much
more stable foundation.

Many of the younger dealers, who operate on smaller amounts of capital than the older firms, have an additional reason for becoming hedgers. This is a fact when a speculative dealer put his business on the safer hedging basis he, in many cases, raises his credit standing with the banks, and so is able to command more bank loan capital whereby he is enabled to handle more wool.

c. "Full time" vs. "part time" hedgers. Some of the dealers who have adopted hedging are what may be termed "full time hedgers", since they hedge their operations in wool at all times. That is to say, at all times they sell wool futures against which they do not simultaneously make fixed price forward sales of the fibre, and at all times they buy wool futures against uncovered fixed price forward sales of wool. Thus they continuously eliminate from their business all major risks of loss and all opportunities of large speculative profit arising from general changes in wool values. They seek their profits exclusively from the differences between their buying basis and their selling basis. Full time hedgers are definitely tending to increase in number and importance.

The full time hedgers operate as merchants, not as speculators. They do not try to make profits by guessing when wool values are going to advance and when they are going to decline. They seek, rather, to capitalise their special knowledge and skill in the wool trade as such; their knowledge of the quality of wool, of the sources from which various qualities may be obtained, and of the mills which use them; their skill in buying and selling wool to best advantage; their knowledge of
the relative values of the many qualities of wool; their ability to anticipate changes in the relative values of the various qualities because of changes in supply and demand conditions in the various sections of the trade.

Other dealers who use the wool futures market for hedging are what may be termed "part time hedgers". That is to say, sometimes they hedge their operations in wool and sometimes they do not. They hedge when they fear that wool prices will move contrary to their interests as represented by unsold stocks or uncovered forward sales. They do not hedge when they think the market will move in line with their interests from those standpoints.

To illustrate: A part time hedger, on buying at a fixed price, wool which he had not already sold or did not sell simultaneously at a fixed price, would hedge such wool if he thought the wool values were likely to decline; but he would not hedge it if he thought that they were likely to advance. He would argue that it was foolish to hedge the wool in the face of prospects of an advance since hedging would deprive him of profits from such an advance. Part time hedgers would admit that when they carry unsold holdings or uncovered forward sales of wool without hedges against them, they are speculating, but they are willing to speculate at such times.

In the cotton trade, in which hedging has been a trade practice for nearly 70 years, practically all dealers are full time hedgers. It at times they do not hedge, they are loath to admit it, since they do not wish to be known - especially to their bankers - as conducting their business in a speculative way, even in part.
d. The general method of hedging by dealers. If the dealer buys wool at a fixed price, without having a forward order for it at a fixed price, and the market value of that wool declines and he has to sell it for less than he paid for it, he incurs a loss on it; also, if a dealer makes a forward sale of wool at a fixed price, without having the wool in stock, and before he obtains the wool, the market value of such wool advances, and he has to pay more for the wool than his selling price, he incurs a loss on the wool. To protect himself against such losses, the hedging dealer, in buying wool for stock at a fixed price, sells wool top futures against it; and then when he sells the wool at a fixed price, he buys an equal amount of wool futures. If he takes a loss on the wool, he has an approximately offsetting gain on futures. The hedging dealer, on making an uncovered forward sale of wool at a fixed price, buys wool futures against it, and then when he buys wool at a fixed price to cover the forward sale, he sells an equal amount of wool top futures. Thus if he takes a loss on the wool, he has an approximately offsetting gain on the futures.

As already noted, hedging dealers, by their hedging operations, give up opportunities of speculative profits arising from market movements favorable to their merchandising positions, for if they make speculative profits on their wool, they incur offsetting losses in their futures. They do this because they know that they cannot retain the opportunities for speculative profits without carrying the risk of speculative losses. They give up the speculative profits to free themselves from the speculative losses. They seek their profits, in the difference between their buying basis and their selling basis. The profits so derived constitute, in essence, merchandising margins.
4. Conclusion: As has been previously stated, much of the risk encountered in the wholesaling of wool can and should be avoided by the proper use of hedging. However, a widespread knowledge or appreciation of the values accruing to the wool wholesaler through the proper use of the hedging technique does not seem to exist. The reasons seem to be chiefly based on the fact that prior to 1941 the only way to hedge raw wool was on the wool tops exchange. For some this method was adequate; however, for many more the task of figuring an adequate basis between the price of their product and the price of the standard wool top futures contract was too great. This, then, was the major deterrent to widespread adoption of the hedging principles. However, with the inception of the raw wool futures market in 1941, this problem was adequately overcome. It became a relatively simple matter to find an adequate basis on which the farmer, wholesaler, and manufacturer could hedge their holdings. A second and equally powerful reason which prevented the widespread use of the hedging principle, on the part of the wool merchant, was the shortage of wool created by World War II. From the time of the enemy attack on Pearl Harbor until January 1942, raw wool prices rose; in the early months of 1942, however, the price of raw wools was pegged by a ceiling price. From 1942 to 1945 wool was short; hence prices held to the ceiling preventing any major price fluctuations. During the years from 1940 to 1945, the risks usually thought inherent to the wool industry did not exist because, for the first time since before 1850, the price of wool was relatively stable. However, with the return of the world to a more normal peace time economy, the price of wool was once more set free to continue
on its way, up and down the hills and valleys of supply and demand.

The wool merchant is today in a most enviable position. Not only does he have the incentive but now he has the means by which he can avoid the risks involved in marketing raw wool in an uncontrolled market. The lure of the large speculative dollar is greater; however, it is more than offset by the taxes waiting to devour it. It has come to be realized by many of today's wool dealers that a moderate, steady income with low taxes will more than surpass a few flashy speculative gains. It is the old story of the tortoise and the hare. It is this author's belief that if all who handle wool would become full time hedgers, there would be a greater tendency toward a more stable wool price. Many of the most violent price fluctuations would be retarded and possibly eliminated if the wool dealer would stick to a merchandising profit rather than flirting with financial extinction in order to make large speculative profits. (See Chart 15.) This condition can be best illustrated by the 50% increase in price and the equivalent loss, all of which occurred during the year 1950. This was caused by speculators who, as it turned out, were greatly fooled. The solution to this and most other situations caused by commodity price variations is a relatively simple one. Here is the solution by means of which the speculators found their way out of the woods in 1950, according to Mr. Stanford L. Luce, secretary of the wool associates of the New York Cotton Exchange. *

* "When prices began to fall last spring many were unprepared, for in recent years it appeared so easy to buy wools for re-sale at a profit that the fundamentals of hedging had in many instances been neg-

#13, Feb. 9, 1952.
lected, if not entirely forgotten. A sharp drop in prices, however, sud-
denly recalled to many dealers and mills that hedging might not be such
a bad idea after all. With the value of inventories shrinking daily, it
was only natural, therefore, that the trade turn toward the two futures
markets in an effort to solve at least some of their financial problems
and preserve their capital during the collapse of world wool prices. As
data for last year now discloses, hedging of wool inventories became a
major operation for many firms, and activity in both wool top and wool
futures expanded tremendously.

Although the futures markets were closed throughout February
and March, and part of April, due to the lack of O.P.S. ceilings, the
almost ten months of the year in which trading was conducted resulted
in 119,315,000 pounds of wool top futures being traded (one side of
each trade only), compared with 78,015,000 in 1950. Hedging in wool
futures was even more active than in wool top futures, with one side
of each trade during the year representing the equivalent of 194,280,000
clean pounds of wool, compared with 56,941,000 in 1950. Combined trad-
ing in both markets, therefore, represented the equivalent of about
800,000,000 greasy shorn pounds of domestic wools.

In conjunction with the active hedging that occurred, the
open position in both markets naturally increased. On November 30, 1951
the open position in wool top futures rose to 3,207 contracts, and the
open position in wool futures rose to 3,558 contracts on December 17 -
both new records in the history of the Exchange. The combined open po-
sition in both markets represented about 100,000,000 pounds of domestic
shorn wools. All of this activity appeared to be the best advertise-
ment there could be for the benefits of hedging. Undoubtedly many
firms hedged for the first time in years, if not the first time in their individual histories."

In the light of what has been previously said it becomes self evident that the rational wholesaler of wool dealing on today's uncertain market should hedge his inventory to spread his risk. It is this author's opinion that part time hedging is not enough. Where the market is subject to variations. The policy of full time hedging should be adopted by all members of the wool wholesaling trade. For their own individual benefit and for the benefit of the trade as a whole, members of the cotton trade through seventy years of experience have found it to be the best method of conducting their operations. The opportunities for similar benefits is at last open to the wool dealers who should avail themselves of this opportunity.
CHAPTER VI
The Future for the New Wool Wholesaler
and the Boston Market

A. Synthetic Fibres vs. Wool Fibres.

1. The problem. ".....It breathes with you, keeps you feeling like a snowflake." This phenomenon, says the advertising copy, is produced with a mixture of 86% Orlon and 14% wool. Pictured on other pages are coats of 100% Orlon ("warmer than wool, washable, resistant to rain, wrinkles and moths"), which are "making history". History is being made in many quarters - in rugs that look and feel like wool but are rayon, in men's long underwear that does not shrink or itch, woven as it is of Dynel. The public, which for centuries sat upon, trod upon, and kept itself warm and happy with wool, is being told that it can be happy, even ecstatic, walking on an extrusion of wood pulp or clothing itself in a mixture of adipic acid and hexamethylenediamine (which one copywriter referred to as 100% virgin nylon. Nylon is about as virgin-al as, say, a dish of spaghetti.).

These are the excited claims of manufacturers and merchandisers.

But the confident voice of science is also heard proclaiming the textile industry's new day. Dr. Roger Adams, of the University of Illinois' Chemistry Department, writes flatly: "An official of the wool industry made a statement recently that the demand for wool as a fabric will never be replaced." These words were spoken by one completely unfamiliar with the potentialities of chemical research. Just as the automobile

*In the February 15, 1952 issue of Science, published by the American Association for the Advancement of Science.
replaced the wagon synthetic fibres will replace natural fibres. "Half
the wool now consumed," vows Dr. Adams, "will be replaced by synthetic
fibres within ten to twenty years....".

To such challenges and such advertising, organizations like
the wool bureau react with a gritty sense of outrage. Eugene Ackerman,
head of the wool bureau says, "We live in a world of promotional claims
in which wool has never been in a better position. So far," he says,
"there is no man made fibre that combines all of wool's good qualities,
resilience, hand, dyeability, and non-flammability. It has taken the
best part of a million years or so to perfect the sheep. It may not
take scientists that long to invent a fair wool substitute, but to be
successful, they must produce a fibre containing the very substance of
life, which is the basis of wool's greatness."

"Rayon", he says, "has been around for more than thirty years
without hurting wool." At this point Mr. Ackerman notes that rayon is
"a cellulose product only a few steps removed from gunpowder, and with
a pair of shears, cuts off pieces of synthetic sweaters and ignites
them and watches them go up in flames, or melt into driblets like hot
sugar water." Wool, as he demonstrates, merely smoulders.

Propaganda claims and counter claims unfortunately confuse
the situation. However, let us examine the facts and try to settle
the question of whom is right, Dr. Adams or Mr. Ackerman.

What is happening today is a revolution in the textile in-
dustry - the third in 150 years. The first revolution came at the close
of the eighteenth century when Eli Whitney invented the cotton gin. Be-
fore that, wool accounted for seventy-eight per cent of the world's
textile consumption. However, with the coming of the cotton gin, cotton swept wool from its proud position.

The second revolution had its beginnings in 1884, when rayon was first discovered. It did not come out of the laboratory until 1920, at which time it came in such quantities that it forced wool to relinquish another position amongst the world's fibres.

Today's revolution actually began in 1938, when chemists tapped the secret of Nylon. But the most recent spectacular developments in the fibre world go back scarcely more than four years, which leads some people to observe that it is far too early to predict anything about the ultimate outcome.

At the end of the second World War there was a surplus of some two billion pounds of scoured wool in the United States and British warehouses. Such a surplus was expected to last for years. But the stock piles vanished in a tremendous post war demand, during which time consumption exceeded production by an average of 325 million pounds (scoured) a year. Then the Korean War exploded. Commodity Credit Corporation stocks of wool were down to five million pounds. The United States woke up to the fact that it should start stock piling again and began frantically buying. In June 1950, the Australian auctions had closed at $1.76 per pound for fine grade wool. When the auctions closed for Christmas the price had reached $2.80. Then the munitions Board announced it would stockpile 350 million pounds, and auctions reopened with quotations of $3.22. By the middle of March buying by the government, civilian users, and speculators had pushed the price to a record $3.73.
What happened after that was sheer tragedy for most wool dealers. The Pentagon suddenly announced that it was suspending its purchasing program, subsequently said it was going to conserve wool by specifying the use of as much as 15% nylon in cloth for uniforms. Raw wool prices collapsed, jerked along, and finally hit a new low of $1.33.

All this was going on in a period of bursting activity in the chemical world. Nylon had come back from the war. It was being made not only in long continuous filament but also as a staple yarn (short length fibre) which could be woven into seaters, socks, upholstery, rugs. Rayon and acetate, which has been competitors chiefly of cotton and silk were undergoing refinements that put them in the market with wool. Acetate, for example, was made more resistant to acid fading; rayon was given a softer feel and made to take dyes more uniformly. And one after another, there appeared synthetics that today give the revolution its spectacular sound: Orlon, Dynel, Daeron, Acrilan (all from a chemical base), Visara (with a protein base).

Through all meanderings of the wool price, the man-made fibres moved only in the most decorous fashion: rayon staple from 35 to 41 cents per pound, acetate staple around 42 cents, Nylon staple from $1.70 to $1.80. The price of the others moved but little: e.g., Dynel increased from $1.25 to $1.40, Orlon stayed at $1.90. To be sure, the latter synthetics had not been around long enough to show much price change, but there is no reason why there should be any large fluctuations. Prices should go down once research and development costs have been written off and once synthetics get into full scale commercial production.
### Man-made fibers

#### Basic raw materials

<table>
<thead>
<tr>
<th></th>
<th>Cellulose</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rayon</td>
<td>Wood pulp</td>
<td>Corn protein (zein)</td>
</tr>
<tr>
<td>Acetate</td>
<td>Wood pulp</td>
<td>Soft, luxurious hand, dyes easily</td>
</tr>
<tr>
<td>Vicara</td>
<td>Corn protein (zein)</td>
<td>Soft, luxurious hand, dyes easily</td>
</tr>
</tbody>
</table>

#### Manufacturer

<table>
<thead>
<tr>
<th></th>
<th>Cellulose</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rayon</td>
<td>American Viscose Celanese</td>
<td>Virginia-Carolina Chemical</td>
</tr>
<tr>
<td>Acetate</td>
<td>American Viscose Celanese</td>
<td>Du Pont Chemical</td>
</tr>
<tr>
<td>Vicara</td>
<td>American Viscose Celanese</td>
<td>Tennessee Eastman Chemical</td>
</tr>
</tbody>
</table>

#### Qualities

<table>
<thead>
<tr>
<th></th>
<th>Cellulose</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rayon</td>
<td>Strong, dyes well, absorbs moisture</td>
<td>Weak, especially when wet</td>
</tr>
<tr>
<td>Acetate</td>
<td>Soft hand, drapes well, has lustrous look</td>
<td>Weak, especially when wet</td>
</tr>
<tr>
<td>Vicara</td>
<td>Soft, luxurious hand, dyes easily</td>
<td>Weak, especially when wet</td>
</tr>
</tbody>
</table>

#### Limitations

<table>
<thead>
<tr>
<th></th>
<th>Cellulose</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rayon</td>
<td>Gets weak when wet, wrinkles easily</td>
<td>Sensitive to heat, has low strength</td>
</tr>
<tr>
<td>Acetate</td>
<td>Sensitive to heat, has low strength</td>
<td>Weak, especially when wet</td>
</tr>
<tr>
<td>Vicara</td>
<td>Sensitive to heat, has low strength</td>
<td>Weak, especially when wet</td>
</tr>
</tbody>
</table>

#### Chief uses

<table>
<thead>
<tr>
<th></th>
<th>Cellulose</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rayon</td>
<td>Dresses, blouses, underwear, summer suiting, carpet, heavy-duty tire cord, conveyor belts</td>
<td>Filter and pressing clothes; chiefly a blending fiber in suits, sport clothes, dress goods, pile fabrics, linings</td>
</tr>
<tr>
<td>Acetate</td>
<td>Dresses, blouses, underwear, heavy, linings, upholstery, curtains, draperies, carpets, blankets</td>
<td>Suits, coats, blouses, skirts, dresses, work clothes, auto tops, sails, awnings, filter fabrics, electrical insulation</td>
</tr>
<tr>
<td>Vicara</td>
<td>Dresses, blouses, underwear, heavy, linings, upholstery, curtains, draperies, carpets, blankets</td>
<td>Blankets, knit goods, socks, filter cloth</td>
</tr>
</tbody>
</table>

#### Production in 1951-1953:

<table>
<thead>
<tr>
<th></th>
<th>Cellulose</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rayon</td>
<td>366 million</td>
<td>429 million</td>
</tr>
<tr>
<td>Acetate</td>
<td>1,189 million</td>
<td>678 million</td>
</tr>
<tr>
<td>Vicara</td>
<td>8 million</td>
<td>40 million</td>
</tr>
</tbody>
</table>

#### Price per pound

<table>
<thead>
<tr>
<th></th>
<th>Cellulose</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rayon</td>
<td>Staple: $1.90</td>
<td>Filament: $3.75 (75 denier)</td>
</tr>
<tr>
<td>Acetate</td>
<td>Staple: $1.00</td>
<td>Filament: $7.80 (76 denier)</td>
</tr>
<tr>
<td>Vicara</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

#### Synthetic

<table>
<thead>
<tr>
<th></th>
<th>Cellulose</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orlon</td>
<td>Acrylonitrile (chiefly)</td>
<td>Du Pont</td>
</tr>
<tr>
<td>X 51</td>
<td>Acrylonitrile (chiefly)</td>
<td>American Cyanamid</td>
</tr>
<tr>
<td>Acrilan</td>
<td>Acrylonitrile (40% Vinylic chloride)</td>
<td>Chemstrand</td>
</tr>
<tr>
<td>Dynel</td>
<td>Acrylonitrile (chiefly)</td>
<td>Union Carbide &amp; Carbon</td>
</tr>
</tbody>
</table>

#### Qualities

<table>
<thead>
<tr>
<th></th>
<th>Cellulose</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orlon</td>
<td>Resists sun and rain, resilient, bulks, launders easily, dries quickly, light weight</td>
<td>Claimed: dyes well, bulks, resists wrinkles, launders and dries easily</td>
</tr>
<tr>
<td>X 51</td>
<td>Resists sun and rain, resilient, bulks, launders easily, dries quickly, light weight</td>
<td>Claimed: dyes well, bulks, resists wrinkles, launders and dries easily</td>
</tr>
<tr>
<td>Acrilan</td>
<td>Resist chemicals, launders and dries easily</td>
<td>Does not support combustion, bulks, does not shrink, resists chemicals, launders and dries easily</td>
</tr>
<tr>
<td>Dynel</td>
<td>Can be ironed only at low heat</td>
<td>Does not dye readily, static</td>
</tr>
</tbody>
</table>

#### Limitations

<table>
<thead>
<tr>
<th></th>
<th>Cellulose</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orlon</td>
<td>Suits, coats, blouses, skirts, dresses, work clothes, auto tops, sails, awnings, filter fabrics, electrical insulation</td>
<td>None</td>
</tr>
<tr>
<td>X 51</td>
<td>Blankets, knit goods, socks, filter cloth</td>
<td>None</td>
</tr>
<tr>
<td>Acrilan</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Dynel</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

#### Production in 1951-1953:

<table>
<thead>
<tr>
<th></th>
<th>Cellulose</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orlon</td>
<td>1 million; commercially available in September</td>
<td>30 million</td>
</tr>
<tr>
<td>X 51</td>
<td>25 million in 1954</td>
<td>None</td>
</tr>
<tr>
<td>Acrilan</td>
<td>4 million</td>
<td>None</td>
</tr>
<tr>
<td>Dynel</td>
<td>1 million; commercially available in September</td>
<td>None</td>
</tr>
</tbody>
</table>

#### Price per pound

<table>
<thead>
<tr>
<th></th>
<th>Cellulose</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orlon</td>
<td>Staple: $1.85</td>
<td>Filament: $3.75 (75 denier)</td>
</tr>
<tr>
<td>X 51</td>
<td>Staple: $1.40</td>
<td>Filament: $7.80 (76 denier)</td>
</tr>
<tr>
<td>Acrilan</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Dynel</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>
**Synthetic**

<table>
<thead>
<tr>
<th>Nylon</th>
<th>Polyester</th>
<th>Vinyl</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NYLON</strong></td>
<td><strong>DACRON</strong></td>
<td><strong>SARAN</strong></td>
</tr>
<tr>
<td>Hexamethylene-diamine</td>
<td>Teraphthalic acid</td>
<td>Vinyl chloride</td>
</tr>
<tr>
<td>Adipic acid</td>
<td>Ethylene glycol</td>
<td>Vinilidene chloride</td>
</tr>
<tr>
<td>Du Pont</td>
<td>Firestone Plastics</td>
<td>Du Pont</td>
</tr>
<tr>
<td>Chemstrand</td>
<td>National Plastic Products and four others</td>
<td></td>
</tr>
<tr>
<td>(in 1953)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resists abrasion,</td>
<td>Resilient, resistant to abrasion</td>
<td>Fire resistant, tough, durable, chemically inert</td>
</tr>
<tr>
<td>strong, elastic,</td>
<td>and wrinkles</td>
<td></td>
</tr>
<tr>
<td>light weight,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>launders well,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dries quickly</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deteriorates on</td>
<td>Difficult to dye, static</td>
<td>Sensitive to heat</td>
</tr>
<tr>
<td>long exposure to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sun, static</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dresses, blouses,</td>
<td>Suits, shirts,</td>
<td>Screening, upholstery, seat covers,</td>
</tr>
<tr>
<td>underwear, hosiery,</td>
<td>blouses, sweaters,</td>
<td>luggage, carpets, outdoor furniture</td>
</tr>
<tr>
<td>bathing suits, snowsuits,</td>
<td>socks; sewing thread; high-</td>
<td></td>
</tr>
<tr>
<td>sweaters; carpets,</td>
<td>pressure fire hose</td>
<td></td>
</tr>
<tr>
<td>upholstery; haw-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sers, cargo nets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>125 million</td>
<td>3 million</td>
<td>18 million</td>
</tr>
<tr>
<td>250 million</td>
<td>35 million</td>
<td>20 million</td>
</tr>
<tr>
<td>Staple: $1.80</td>
<td>Staple: $1.80</td>
<td>Staple: 90¢–$1.05</td>
</tr>
<tr>
<td>Filament: $2.25</td>
<td>Filament: $3.00</td>
<td>Monofilament: 80¢–$1.05</td>
</tr>
<tr>
<td>(40 denier)</td>
<td>(40 denier)</td>
<td></td>
</tr>
<tr>
<td>Monofilament:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$6.00 (15 denier)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Inorganic**

<table>
<thead>
<tr>
<th>Glass</th>
<th>Glass Fiber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica sand</td>
<td></td>
</tr>
<tr>
<td>Limestone</td>
<td></td>
</tr>
<tr>
<td>Owens-Corning</td>
<td></td>
</tr>
<tr>
<td>Fiberglas</td>
<td></td>
</tr>
<tr>
<td>Five other</td>
<td></td>
</tr>
<tr>
<td>companies</td>
<td></td>
</tr>
<tr>
<td>Very strong,</td>
<td></td>
</tr>
<tr>
<td>non-flammable,</td>
<td></td>
</tr>
<tr>
<td>resists chemicals</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Low resistance</td>
<td>Electrical insulation, filter cloth,</td>
</tr>
<tr>
<td>to abrasion</td>
<td>reinforcement for</td>
</tr>
<tr>
<td></td>
<td>plastics, papers,</td>
</tr>
<tr>
<td></td>
<td>rubber; draperies,</td>
</tr>
<tr>
<td></td>
<td>curtains</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>40 million</td>
<td>65 million</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Staple: 55¢–$1.15</td>
<td>Staple: 40¢–$1.60</td>
</tr>
<tr>
<td>Filament:</td>
<td></td>
</tr>
</tbody>
</table>
a. The Reaction of Textile Manufacturers to Synthetics. Re-
actions of textile manufacturers to all this ranged from an attitude of
careful contemplation to warm excitement. The textile business, face to
face with growing consumer resistance, was in a shaky state that turned
into a real slump. This somewhat desperate climate gave revolutionary
ideas extra impetus. What several manufacturers have done in the situ-
atation is worth noticing.

American carpet men long felt unhappy at being as dependent on
overseas wool supplies. The carpet sources are chiefly Tibet, India and
Argentina. Tibet is now closed. India has sharply limited her export
and imposed a thirty per cent export duty. The price of carpet wool,
even more unstable than apparel wool, in March 1951 was $2.24, up 350
per cent over March 1947, price of 35.5 cents.

Bigelow-Sanford, the country's biggest carpet maker, has been
experimenting with synthetic fibres since 1935. Last year when Bigelow
was caught between wild wool prices and indifference of consumers and
being driven into the red $2,300,000, it purchased its own rayon mill
in Rocky Hill, Connecticut. In 1951 it used rayon in 27 per cent of its
production. This year, confident of rayon's new strength and dyeability
(coarse carpet wools have always been difficult to dye), Bigelow-Sanford
has completely reversed its manufacturing schedule. It will use rayon
in 75 percent of its production. This will include a big line of all-
rayon carpets, which have higher style, wear just as well as wool, and
retail for much less.

Deering Milliken (woolen, cotton, and rayon goods) has been
blending wool and rayon for the past 11 years. About 80 per cent of its
wool division's business was in all wools. But this year less than 50 per cent will be in all-wool fabrics. Blends will include practically all the synthetics. President Minot K. Milliken is willing to predict that all wool fabrics will not account for more than 25 per cent of his wool division's business in 1954, about 5 per cent in 1957.

Goodall-Sanford (Palm Beach suits, woolens, carpets, draperies, upholstery) reported on the trend in upholstery for cars. Formerly, moderate-price cars used only 100 per cent wool fabrics. Now such fabrics will consist of only 50 per cent or less wool. Chrysler uses some all-synthetic upholstery. Oldsmobile uses upholstery of 100 per cent nylon. In 1946 Goodall-Sanford was using synthetics in only 20 per cent of its production; in 1951 it used synthetics in 45 per cent.

In lesser and greater degree, then, goes the revolution. It is necessary to keep the facts in perspective. Man-made fibres now add up to 21.6 per cent of textile fibres used in the United States (cotton is 71.2 per cent, wool 7.1 per cent and silk 0.1 per cent). Leaving rayon and scotate out of the man-made fibres, the new ones comprise only 3 per cent. Including nylon, some are being consumed by the textile industry, as against 489 million pounds of wool, secured. The importance of the new synthetic lies not only in what they are doing now but in their intrinsic qualities and what they can do tomorrow.

b. Hydrophobes vs. Hydrophilic. Synthetics are not substitutes or second best. They have their own separate and peculiar properties, many of which overlap (see Chart on page 109). Many are designed to make up for a lack inherent in some other fibre. No fibre can have everything; often to acquire one property, another must be sacrificed.
Glass fibre, for example, is exceedingly strong, stronger than nylon; but it is brittle and therefore pretty much limited to industrial uses. Nylon's super elasticity is what made it indispensable for glider pickup rope and ideal for woman's legs. But nylon deteriorates in sunlight and soot, and sags in dampness.

DuPont's Orlon is resistant to sunlight and dampness. Orlon also bulks (can be made woolly), so that it is highly desirable for coats, suits, sweaters. Orlon, however, is difficult to dye.

DuPont's Dacron sheds water like a duck, and wet or rumpled, keeps its crease. But it has a tendency to glaze under an iron at normal pressing temperatures.

Chemstrand's Acrilan is similar to Orlon in that it bulks. It lacks resilience, however, and is apt not to hold dye when washed or cleaned. Acrilan has been withdrawn temporarily from the market to give Chemstrand a chance to make another try.

Union Carbide and Carbon's Dynel has such versatility that it can be used for thick-pile fabrics, paint applicators, and acid resistant coveralls. Since it will not support combustion, it has been woven into 14,800 yards of draperies and bed spreads for the new "fireproof" liner United States. Dynel is one answer to Mr. Ackerman's dive demonstrations of the combustibility of synthetics. Curiously enough, however, Dynel cannot be ironed except at very low heat; otherwise it shrinks and stiffens.

National Plastic Products' saran is another fibre of great versatility and great strength. Its toughness, however, can be a drawback. There have been complaints that saran, used in auto seats, wears out trousers seats.
All of the foregoing fibres are hydrophobic: they repel water. That is why they do not shrink, dry quickly, do not absorb dye easily, and being non-absorbent, stick to perspiring backs. They are also non-conductive, so that any friction will set up an electrical discharge, which can be annoying and in operating rooms could be downright dangerous. Wool is hydrophilic: it has an affinity for water. That is why it dyes easily. That is why it shrinks: when wet wool is mishandled the fibres congeal and do not regain their position.

The nearest synthetic, so far, to a man-made wool is Virginia-Carolina Chemical's Vicara, which absorbs moisture dyes well and is unpalatable to moths. But Vicara is a weak fibre that needs a reinforcing blend; it cannot stand alone.

Limits to Wonder Fabrics. The synthetics have confronted manufacturers with problems of handling. Mistakes were made by hasty exploiters. "Nylon was used for a lot of things it was not intended for," said a DuPont spokesman. Retailers are discovering the high cost of busheling (fixing trouser and sleeve lengths, adjusting shoulders, etc.) on rayon summer suits. Since Rayon keeps its thread holes, retailers have to sell suits a size large so they can be taken in, instead of let out. The result is a good deal more busheling, was costing him 12 to 15 per cent of his volume on rayon suits. In tropical worsteds, thread holes can be eliminated with a shot of steam and a hot iron.

The new synthetics will not mould with the ease and nicety of wool.

That is why the synthetic manufacturers, in company with the fabric manufacturers, are cautiously and judiciously emphasizing the im-
portance of blends. One fabric maker predicted: "There is not going to be a wool industry, or a nylon industry, or any single kind of synthetic industry. What there is going to be is a TEXTILE industry."

By this he means that fabric makers will draw on the whole field of fibres, including wool, using them the way the steelmaker uses alloys and ore to produce various special results. This should produce some remarkable improvements in fabrics of all kinds in clothing for the already well-clothed United States.

The whole business is in a state of flux and suspenseful activity. "There are hundreds of fibres that researchers are thinking about," said a spokesman for Union Carbide. "There are scores in the test tubes, dozens in experimental stages being made in pound lots, about four being made by Union Carbide in 100 pound lots." Over the next few years there will be casualties among the synthetics. Rayon and acetate may get hurt. Cotton, as well as wool, may suffer in the revolution.

Enthusiasts may forget that there are also physical limitations to production even in the miraculous chemical world. True, the basic materials are plentiful, but there are government priorities on metals required for building machinery and plants.

A final, overriding factor is the sheer cost of developing a whole new world of textiles. DuPont spent ten years and $27 million on the first pair of nylon stockings. It gambled $7 million and $18 million on initial plant development for Orlon. Another $25 million is going into the Orlon staple plant which opened last spring. By the middle of 1953, when DuPont's new Dacron plant in Kinston, North Carolina goes
into operation, DuPont will have invested $40 million in that product. In other words, it has gambled $90 million on Orlon and Dacron, which in 1953 will be rolling out at an estimated rate of 75 million pounds a year. Various other synthetic fibre now under construction will total an estimated $250 million. The end product of all these investments may be the production in a few years of some 500 million pounds a year of the new synthetic fibres.

c. Its Own Worst Enemy. The wool growers are up against the United States public's indifference to their problems. Americans like wool, but they do not give worry about sheep men. There is every reason, on the other hand, for the United States Government to encourage synthetics as a wool replacement. The United States which before World War II grew three-fourths of its wool requirements, is now shakily dependent on overseas sources for the same proportion. Not even the most devoted sheepman would say that American flocks could be increased to the point of making the country self-sufficient. Although the United States stock sheep population increased slightly in the past two years, it is now down to 27,800,000 sheep from a high of 49 million in 1942. The land will not support any sizable increase. Grazing allotments on public lands have been decreased because they have been overgrazed and need replenishment, according to the Department of Agriculture.

The industry is attracting less and less capital, fewer and fewer people. Basque herders had to be imported last year; Americans for the most part do not like living alone with sheep. Labor costs are high. Losses to predatory animals are high. Income returns, compared to cattle, are low.
Wool, in a way, is its own worst enemy. It is a variable raw material which causes weaving troubles and expense for the mills. It comes from the sheeplands as "grease" wool, brown and matted and filled with dirt, grease, grass, burrs, and dung. Before it can be spun it must be put through several processes, including scouring, carding, and combing, which are laborious and expensive. Synthetics arrive at the mill exactly uniform in their chemically controlled properties, clean and ready to be spun.

2. Future Outlook for Wool in the Textile World. Set against these troubles in the wool world, however, are some facts that should give pause to any one who is about to conclude that history is against the sheep, that its time is about up, and that it is going the way of the silk worm. Wool itself will profit from science, which can improve its properties and increase its versatility and usefulness. Blended with synthetics, it may go to markets now closed to it. A wool and synthetic fabric, for instance, may be safely put in a laundry tub.

The sheep is not in the same narrow economic sphere as the silk worm. Silk worms cannot be eaten. The sheep man always has another string in his bow, which is meat, and which in the United States now provides roughly over 65 per cent of a grower's income. Beyond that is the tremendous vested interest around the world in sheep, which is many times that of the synthetics investment. United States sheep men alone have $780 million tied up in their 28 million stock sheep, not to mention great investments in land facilities. The sheep population of the world is 761,700,000. The world at present consumes 2.2 billion pounds of wool (scoured) a year. Wool is an industry backed by governments
and government treasuries. Per capita consumption of wool in the world has actually increased, and nowhere more spectacularly than in the United States, where the average per capita consumption in the period 1946-1950 was 73 per cent higher than in the period 1934-1938.

Wool will be forced into some retreats. That it will retreat in localized sectors like the carpet industry is a reasonable conclusion. That it will be forced into other, relative retreats, percentagewise is also a reasonable conclusion. But barring any world convulsions, and assuming a continued increase in human population, the sheep should survive the present textile revolution.

The chemical industries loudly disclaim any intention of driving sheep out. That is only logical. In their internecine war the synthetic makers need wool to exploit their own products. They are, in effect, riding into new textile fields on the backs of sheep. Their friendly feeling toward sheep will continue just so long as there is not available in vast quantities any man-made equivalent of wool.

Dr Adams is undoubtedly right in asserting that such an equivalent is possible. But in view of the present limiting factors on synthetics his prediction that "within ten to twenty years" the synthetics "will replace" an annual one billion pounds of wool seems not to be supported by the facts of the present situation.

B. Effects of the textile shift from the New England or Boston wool market.

1. The problem. If the wool textile industry is moving away from New England, it can relocate itself in any one of two ways. It can relocate itself in a single section of the United States, or it may dis-
perce and each segment of the industry may seek out a different major market area as its new location. It is important that we establish which of these methods the shift will take or is taking, if indeed there is a major shift in progress now, or expected in the near future. If the wool textile industry should relocate itself as a unit in a single geographic area, it may well be that as time goes on the raw wool market presently situated in Boston will move to a new location centralised in the heart of the new textile producing area. If, however, the industry should generally disperse, then the Boston market could still hold its position despite the increased difficulty of reaching a far flung sparsely scattered market.

These then are the questions facing us as we attempt to predict the trend and location of the raw wool marketing center of the future.

1) Is there or will there be a major shift of the wool manufacturing industry to some new geographic location?

2) If that shift occurs, or has occurred, where has or where will the industry relocate itself? Will it recentralize itself or just shift generally with the population?

2. Solution. In the answer to the first question, the figures available at this time do not show any inclination on the part of the wool textile industry to migrate to the South or any other part of the country. Chart II is a comparison of the number and location of industries engaged primarily in wool and hair manufacture in the United States in the years 1939 and 1947, although these figures do not give any indication of the volume of business done by the different manufacturers in said geographic areas. That, however, is not the question under discussion. The num-
ber of the locations and relocations, if any, are the factors which will aid in the solving of this problem. Is there a shift of the wool textile industry itself? The figures on Chart II become more significant when we consider the historical background of the wool textile manufacturing industry. In the year 1899 there was a total of 1,246 establishments in the United States engaged primarily in wool and hair manufacture. From 1899 there was a steady decrease in the number of mills manufacturing wool textiles, until in 1939 the total dropped to 600 establishments. From 1933 to 1947 the number of establishments followed a steady increase. The number rose from 600 to 828 mills engaged in wool textile manufacture.* The significance of these figures lies in the fact that the increases found in Chart II are not manifestations of a relocation. Rather they are the result of a natural growth trend within the industry. The New England states showed the greatest increase of wool textile manufacturing establishments, while the Middle Atlantic states were second and the Southern states third. The Middle Atlantic states showed an increase of over four times that of the Southern states, while the New England area increased six times as much. A further analysis brings to light the fact that the state of New York was almost entirely responsible for the dramatic increase found in the Middle Atlantic states. The New England states, however, still contain almost twice as many wool textile manufacturing establishments as their nearest competitor, the Middle Atlantic states. Hence there would be little or no incentive for the wool dealer to relocate himself in the Middle Atlantic states region. Massachusetts still contains the largest number of customers for the wool dealers. The New England-New York-Pennsylvania area can be adequately

*See Chart 3
covered by salesmen from Boston as they have in the past. The dealers in Boston also cover the Central states up to the Mississippi River. This area contains over 90% of the wool textile manufacturing establishments in the United States. The frequency of occurrence when applied to wool textile manufacturing establishments is very high in Massachusetts. It is the highest of any state in the Nation. New England ranks highest in occurrence for a geographic area. In other words, the situation might be likened to a rock dropped into a pond. Boston would be the center where the rock struck the water. There we would also find the center of highest frequency of occurrence. As the rings project out further from Boston, the frequency becomes less in proportion to the distance of the rings from the center.

B. Conclusion. With the preceding facts in mind it becomes logical to conclude that a major shift in the wool wholesaling industry is not likely to become a reality for many years. The wool textile industry will have to manifest a mass migration to some other part of the country, and there would in all probability be a substantial time lag between the beginning of this migration and the pinch being felt by the wool wholesaler of Boston. Then, and only then, would the wholesalers contemplate a migration of their own if the circumstances warranted it. If such a shift did come it would probably follow the following pattern: First, the establishment of a branch office in the new market area, and later on as the volume of the branch office sales became far greater than that of the home office, the control would one day be established at that branch office. The original home office would probably remain in existence for a long period of time as a buying organization.
However, from the facts that are available to the author, no migration seems to be in process and none seems to be promised in the near future. Unless there are drastic changes in the present conditions Boston should remain the capital of the wholesale wool industry for the next 50 years at least, and probably many years longer than that.

C. The future outlook for the wholesale wool industry and the Boston wool market.

In the next twenty years there should be a substantial change in the operations of the wool wholesaler. Much of this change can be traced directly to the encroachment of synthetic fibres into the textile industry. We foresee a decrease in the per capita consumption of wool in the United States; however, this will not be of any great consequence to the wool dealer because the increase in size of the population of the Nation should more than offset this decrease in per capita consumption. In other words, people will buy less wool, but the increase in the number of people buying less wool will maintain the total volume of wool consumed.

An even more noticeable change will be found in the uses made of wool. The wool textile manufacturer of today will use less wool per fabric tomorrow. This will be offset by the fact that although the wool manufacturer will use less wool because he is blending his wool with synthetic fibres, there will be many more markets for wool because of this blending process. Wool in the future will be able to enter many fields now closed to it; for example, wool blended with synthetics can be put in the washtub whereas wool alone cannot, unless it receives special attention. There is a whole new era opening up for wool in the future, in
which it will go hand in hand with the other textile fibres, and together
they can become the real miracle fabrics dreamed of today.

This change will have its effect on the marketing task of the
wholesaler selling his wool to the textile manufacturer. The textile
manufacturer will as an individual buy less wool, however, there will be
many more manufacturers using wool. This in effect means that the wool
dealer will make many more sales, but as a rule each will be less in
size. This will cause an increase in selling expense and an enlarge-
ment of the sales force to cover the new customers adequately.

As time goes on the raw wool tariff laws probably will be re-
vised downward and may eventually be done away with altogether; then the
task of the wool buyer will become simplified in that raw wool will be
made available for sale at its point of origin in much larger lots.
These lots will be scientifically tested and the grades, lengths and shrink-
age will no longer be mere estimates, but through scientific testing they
will be accurately known.

As the years progress wide fluctuations in the price of wool
will be a thing of the past. If the wool business is to survive, and we
feel confident that it will, the price of wool has to become more and
more stable until it reaches a point where it will fluctuate only in
some small degree with the cost of living and the size of the wool crop.
How this will be achieved is relatively simple. If wool prices rise e-
ough to throw themselves out of proportion with the price of synthetic
fibres, the textile manufacturers will substitute more synthetics in their
product in direct relation to the rise in the price of wool. This con-
dition will be unavoidable in that when woolen clothing prices get out of
line in the past traditionally the American people have ceased, for the most part, to buy woolen textile products. This puts a pinch on the textile manufacturer who in the past few years have discovered that their solution to this price problem was found by producing cheaper synthetic fabrics. The prices of synthetic fibres are relatively stable, varying only slightly with the cost of living. Wool prices will have to maintain a price level of their own relative to the price of synthetic fibres. This price relationship will dictate the amount of wool to be consumed in any given year. Hence if world wool supplies are short, the price of wool will rise, less wool and more synthetics will be utilised in textile manufacturing in that given year. If the world wool supply is large, then the price of wool will drop and more wool and less synthetic fibres will be used. The above assumption is based, of course, on the assumption all other factors will remain equal. In reality other factors very rarely remain equal, and it is the writer's belief that in a given year when wool prices drop, the synthetic manufacturers will be tempted to follow suit with the price of their products. This, however, is a debatable question and almost impossible to predict. If this condition did come about, then the textile manufacturer would have much more freedom in his choice of fibre blends for that particular season. As it stands now, the net result of lower synthetic fibre prices would not harm the sales of raw wool because the ideal blends for any specific purpose could then be attained at a lower cost. The standard amount of wool called for by the formula of the blend would be utilized, and if either type of fibre suffered it would be synthetics. However the lower price of raw materials would make possible a lower price for the finished product which
should expand total consumer demand for said product. Hence the industry as a whole, all the way down the line, would be in a very strong position because of the increase in sales.

Until such time as science perfects a test tube product exactly like wool, wool will be in demand. The likelihood of producing such a product seems very remote because the trend in synthetics today is to produce synthetic fibres with some of the characteristics of wool, but it is doubtful if we will live to see the day that synthetics will have all the attributes of wool. Wool is a product of life, and science has never been able to duplicate life.

In conclusion, the future of the raw wool wholesale market looks very promising indeed. The wool market will expand, and the product will become more standardized. The price should become, to a great extent, more stable. The speculative side of the wool business will all but disappear. The task of the wool wholesaler will become easier as the speculative kinks are ironed out of the wool trade. The short term future trends of the wool business will become more predictable. It will still be subject to style changes, however. In other words, the wool wholesaler's task will eventually be reduced to the same general situation faced by wholesalers dealing in any standardized product. Indeed this situation may pave the way for many new competitors to enter the market, but the dealers who are firmly entrenched in the market today will be the leaders of that market tomorrow.

The Boston market will remain the central raw wool market of the United States. The dealers in the Boston market will become more highly organized in the days to come. It is this authoer's opinion that
the dealers in the Boston market will promote product research and market research through the medium of a dealer backed organization, possibly in conjunction with the Wool Bureau. The Wool Bureau is a publicity organization backed by English, Australian, and New Zealand wool interests. Their task is to promote the use of more wool in the United States through the use of publicity. This task will undoubtedly be broadened to include the task of product research. These organizations will experiment with new fabrics composed of blends of textile fibres. The product of this research will be presented to the textile manufacturers in the form of superior blends using wool to its best advantage. In other words, to maintain their market the wool growers and dealers will have to develop new and better uses for wool fibres, and sell these new uses and their product to the textile manufacturers and the ultimate consumers.

From our analysis of the so-called wool textile shift* and the synthetic Bogey Man which have been causing untold quantities of anxiety among the farsighted wool dealers of Boston, we see that the wool trade faces a bright future tomorrow. There will be many causes for anxiety in the future, but these will be of a temporary nature. If the dealer keeps his organization on a more or less fluid basis and keeps himself vigilantly on the watch for the changes that are bound to come in the marketing of wool, and adapts his organization to compensate for these changes, he will have a more firm place in the wool trade of tomorrow.

15, July 14, 1952
CHART 17

Number of establishments in the United States engaged primarily in wool and hair manufacture.*

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1899</td>
<td>1,244</td>
</tr>
<tr>
<td>1904</td>
<td>1,045</td>
</tr>
<tr>
<td>1909</td>
<td>953</td>
</tr>
<tr>
<td>1914</td>
<td>842</td>
</tr>
<tr>
<td>1919</td>
<td>903</td>
</tr>
<tr>
<td>1921</td>
<td>855</td>
</tr>
<tr>
<td>1923</td>
<td>895</td>
</tr>
<tr>
<td>1925</td>
<td>872</td>
</tr>
<tr>
<td>1927</td>
<td>800</td>
</tr>
<tr>
<td>1929</td>
<td>758</td>
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<td>1931</td>
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<td>1933</td>
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<td>1935</td>
<td>699</td>
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<tr>
<td>1937</td>
<td>704</td>
</tr>
<tr>
<td>1939</td>
<td>722</td>
</tr>
<tr>
<td>1947</td>
<td>828</td>
</tr>
</tbody>
</table>

*16, P. 107
# Chart 18

Comparison of Number and Location of Manufacturers Primarily Engaged in Wool and Hair Manufacture in the U.S.*
1939 and 1947

<table>
<thead>
<tr>
<th>United States total</th>
<th>1939</th>
<th>1947</th>
<th>Gain or Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>722</td>
<td>828</td>
<td>+ 106</td>
</tr>
</tbody>
</table>

## New England

<table>
<thead>
<tr>
<th>State</th>
<th>1939</th>
<th>1947</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine</td>
<td>42</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>New Hampshire</td>
<td>35</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Vermont</td>
<td>12</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Massachusetts</td>
<td>151</td>
<td>175</td>
<td></td>
</tr>
<tr>
<td>Connecticut</td>
<td>39</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>Rhode Island</td>
<td>109</td>
<td>132</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>388</td>
<td>453</td>
<td>+ 65</td>
</tr>
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## Southern States

<table>
<thead>
<tr>
<th>State</th>
<th>1939</th>
<th>1947</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>North Carolina</td>
<td>7</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>South Carolina</td>
<td>2</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Georgia</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Florida</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennessee</td>
<td>7</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Alabama</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mississippi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arkansas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Louisiana</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Texas</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Oklahoma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>25</td>
<td>36</td>
<td>+ 11</td>
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</table>

## Middle Atlantic

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<thead>
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<th>State</th>
<th>1939</th>
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</thead>
<tbody>
<tr>
<td>New York</td>
<td>49</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>122</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>New Jersey</td>
<td>28</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Delaware</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Maryland</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>West Virginia</td>
<td>8</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Virginia</td>
<td>11</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td>222</td>
<td>259</td>
<td>+ 37</td>
</tr>
<tr>
<td></td>
<td>1939</td>
<td>1947</td>
<td>Gain or Loss</td>
</tr>
<tr>
<td>---------------</td>
<td>------</td>
<td>------</td>
<td>--------------</td>
</tr>
<tr>
<td><strong>Central States</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Ohio</td>
<td>13</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Kentucky</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Indiana</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Michigan</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Wisconsin</td>
<td>13</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Illinois</td>
<td>9</td>
<td>7</td>
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</tr>
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<td>Minnesota</td>
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<td>6</td>
<td></td>
</tr>
<tr>
<td>Iowa</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Missouri</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>North Dakota</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Dakota</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Nebraska</td>
<td></td>
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<tr>
<td>Kansas</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
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<td>57</td>
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</tr>
<tr>
<td><strong>Western States</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Montana</td>
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<td>Wyoming</td>
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<tr>
<td>Colorado</td>
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<tr>
<td>New Mexico</td>
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<td>Idaho</td>
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<tr>
<td>Utah</td>
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<tr>
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</tr>
<tr>
<td>Washington</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Oregon</td>
<td>9</td>
<td>10</td>
<td></td>
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</tr>
<tr>
<td>California</td>
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<tr>
<td><strong>Total</strong></td>
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<td>23</td>
<td>- 7</td>
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