III. A BRIEF HISTORY OF THE SHEEP INDUSTRY IN THE UNITED STATES.

By L. G. CONNOR.

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THE SHEEP INDUSTRY PART OF A SELF-SUFFICING ECONOMY.

INTRODUCTION OF SHEEP INTO THE COLONIES.

Sheep were introduced into the English colonies almost as soon as those parts of the New World were settled. The first sheep to reach the colonies were brought to Jamestown in 1609. In 1648 there were 3,000 in the colony of Virginia. English longwool blood evidently was present to a considerable extent in both the Virginia and Maryland sheep, intermingled with that of many other types. The Virginia flocks seem also to have contained considerable Dorset blood (1)[1].

Sheep were introduced into Massachusetts between 1624 and 1629. Many of those first reaching Massachusetts probably were of the old Wiltshires, a fairly large type giving 2 to 2½ pounds of moderately fine wool per fleece. It seems likely that Romney Marsh sheep also appeared in this colony soon after its settlement. Later a number of Dutch (probably Texel) sheep were introduced (2). In 1642 there were 1,000 sheep in Massachusetts, and 3,000 by 1652 (3).

The Dutch settlements of New York obtained sheep as early as 1625, but the animals did not thrive there as well as elsewhere (5). There were a few in the colony in 1643, and a good ewe sold for as much as $8 to $10 in 1650. More attention was paid to sheep in New York after that colony was taken by the English in 1664 (11A).

The Swedish emigrants settling in New Jersey brought sheep there in 1634, and they increased fairly rapidly, soon appearing in similar settlements in Delaware. The Quakers in Pennsylvania had sheep in 1683. Rhode Island had sheep soon after its settlement in 1636–37, and Southdown blood evidently was present to a considerable degree. This colony seems to have exported numbers of sheep to other colonies at an early date, and was particularly drawn on by Connecticut for breeding stock before 1650 (8). By 1700 the Dutch and

[1] Numbers in parentheses refer to literature cited at the end of the essay.

Swedish strains had practically disappeared from New York, New Jersey, and Delaware (11).

The animals brought into the colonies must not be confused with the modern English breeds, however. None of the remarkable breeding improvements which started in England in the eighteenth century had even been thought of when the colonies were settled. The English sheep then were all relatively coarse, leggy, late-maturing animals, with good foraging qualities. With the probable exception of the longwools—the marsh (fen) types—they usually clipped but 1½ or 2 pounds of wool. The wool usually was of only indifferent quality. Many centuries of more or less unconscious selection, attended with some conscious efforts at improvement, had resulted in the formation of numerous local types practically unknown beyond the limits of their own country or minor geographical division, but the general quality of the animals had been little affected. Strictly speaking, in the present use of the term, there were then no distinct breeds of sheep in England. At the time of colonial settlement the small, light-fleeced, finewools of Herefordshire—the Ryeland type—were at one extreme in wool production while the large, ungainly longwools of the marsh regions of Kent, Leicestershire, and Lincolnshire stood at the other. The Ryeland fleece was much the more valuable. The sheep of the southern downs—the later Southdown—was an intermediate type, very hardy and prolific, and highly valued. As late as 1790 the old Warwickshire strain had a large, heavy, loose-jointed frame—"his chine as well as his rump was as sharp as a hatchet, his skin might be said to rattle on his ribs, and his 'handle' to resemble that of a skeleton wrapped in parchment." It was these old, unimproved types which were sent to America in the seventeenth century.

It is interesting to note that the sheep which appear most prominently in the colonies were usually of the types considered the most valuable in England at that time or which took a foremost place in the breed improvements of the following century. These were the finewooled Ryeland, the hardy and prolific Dorset and Southdown, the larger Wiltshire, and the large longwools of the eastern marsh districts. Evidences of Ryeland blood were discernible in parts of New York and Massachusetts as late as 1810, while the "English" or "Irish Smuts" of the Connecticut Valley clearly trace to an old Down foundation (10). The Kentish or Romney Marsh sheep were a particularly good type for that time. Although used in connection with other longwool blood, they appear to have taken a dominant part in the development of the Texel (Dutch) sheep which appeared in Massachusetts and New York. The latter were the result of a cross between native Low Country stock and Guinea (West African) sheep (10A), greatly improved with English longwool blood.

COLONIAL SHEEP HUSBANDRY.

Sheep had a hard time getting a foothold in the colonies. They were all good rustlers for their forage and able to stand considerable hardship, but conditions were far from favorable for any rapid increase. Predatory enemies (particularly wolves), Indians, and severe winters made serious inroads on their numbers. In all the colonies they had to be placed under the care of herders to secure some degree of protection. One or more common herders for the flock of the entire settlement was the rule in the northern colonies as soon as the number of sheep made it impracticable to keep them within the town inclosure. As far as possible the animals were grazed on islands and peninsulas, the more easily to protect them (12). The Isle of Nahant, and islands in Massachusetts Bay were among the first grazing grounds for Massachusetts sheep (14). Noddles Island was leased to Samuel Maverick in 1633 for "a fat hog, a fat wether, or 40 shillings in money each a year" (15) and evidently was used for sheep raising. A long, low peninsula or "neck" near Boston, called "Rumney Marsh," after the famous Romney Marsh in Kent, was largely devoted to sheep after 1640. Following the old English practice, towns not able to graze sheep, as above described sent them in charge of the common herder, who often folded or penned them with movable gates or "hurdles" at night on the cultivated land of the proprietors in more or less regular order. A small fee per sheep and per lamb was paid the shepherd, who usually was boarded by the man whose land was being grazed at the time (17).

Efforts to increase the flocks to a point adequately to clothe the people, at least with everyday wear, quickly resulted in discrimination in favor of sheep on the pasture areas of the different towns (13). In Connecticut in 1666, sheep were exempted from taxation and given exclusive pasture rights on part of the land. Every male resident of 14 years or older was required to work one day each year clearing away underbrush to extend the area of sheep pasture (13A). Numerous other regulations were adopted from time to time for the better control and increase of the sheep industry.

Stringent measures taken by the authorities in Massachusetts to increase the number bore fruit relatively quickly, and by 1662 sheep in that colony were worth only one-fourth as much as in 1645, when they had been valued at nearly $10 each (40 shillings) and had been assessed at 25 shillings per head for adults. In 1662, in order to encourage sheep raising, the assessment was lowered to 10 shillings. In 1673, when the value of sheep again had fallen, the assessment was lowered to 5 shillings (4).

THE COLONIAL WOOL MARKET.

The wool market[2] was limited almost entirely to the demand for wool for household industry. As a result of encouragement offered by the colonial authorities, supplemented in many instances by stringent regulations limiting intercolonial trade in sheep, wool, or home manufactures of wool (regulations promulgated both by the English and the local authorities), the greater part of the population had to rely on local household manufactures for such part of the clothing needs as was not imported. Domestic manufacture of woolens was one of the first activities, aside from the purely agricultural, to be fostered by the colonial authorities. This was a necessity, as the supply of clothing from England was often inadequate and usually relatively expensive, and there was not much with which to pay for it (18).

The first fulling mill[3] in the colonies was erected at Rowley, near Ipswich, Mass., in 1643 (19). This town was settled in 1638 by persons from Yorkshire, many of whom were skilled at weaving. Weaving was done in the colonies both by members of the family and by itinerant weavers. At times, as in Chelmsford in 1655, a substantial grant of land was given a weaver to settle in the town (20). A considerable proportion of the towns, particularly north of Maryland, had fulling mills by 1700, and a large part of the ordinary wearing apparel was made in the home or the home of a neighbor (21). England strove to limit the industrial growth of the colonies by fostering other enterprises, and the development of the factory system was delayed, largely because labor, particularly skilled labor, was scarce in the colonies, as was also capital. Greater profits were made along other lines than were possible in wholesale cloth manufacture. British efforts to limit the growth of the domestic phase of this industry, however—an activity which offered work for the only cheap labor present in the colonies (women and children)—had but little effect (22).

EFFORT TO INCREASE THE NUMBER OF SHEEP JUST PRIOR TO THE REVOLUTION.

For both economic and political reasons, the colonial authorities strove to increase the number of sheep and the output of domestic manufactures of wool in the decade preceding the Revolutionary War. Both ends were attained, and some slight advance was made in the production of factory-made (or semi-factory made) cloth.

[2] Mutton was usually a minor consideration, except in the vicinity of Philadelphia, New York, and Boston, as there was virtually no market for it. The flesh of the old sheep, if butchered, was far from delicate.

[3] Fulling mills were establishments where, with the aid of fuller's earth, woolen cloth was cleansed of oil and grease and was also shrunk and thickened.

Persons who had previously worn British woolens abstained from them from patriotic motives and wore the coarser homespun. Merchants in many cases ceased importing English woolens in retaliation for unpopular British regulations (23). The domestic manufacture increased markedly, along with an increase in the number of sheep.

In Philadelphia alone, in 1775, 20,000 fewer sheep were butchered than in 1774, in order that the supply of wool might be increased (24). Incidentally, such a decrease in the Philadelphia mutton supply is a striking illustration of the size of the mutton market in that city. A large part of this supply evidently came from New Jersey, which went into this phase of the sheep industry quite early, owing to its favorable location between Philadelphia and New York (25).

During the Revolution the domestic industry, although growing rapidly, was entirely inadequate to meet the abnormally increased demand for woolens. Large quantities of woolens were smuggled in from England by way of France as the war proceeded (26).

IMPROVEMENT IN THE WOOL MARKET AFTER THE REVOLUTION.

For some years after the close of the War of the Revolution the few small factories were unable to meet British competition (29), but the wool market was considerably stronger than before the war. This was due to an acceleration in the household production of woolen goods. The first woolen mill to use more than one loom, one at Hartford, Conn., was not erected until 1788, and there were only four mills in the country worthy of the name until several years after 1800 (30). Virtually the only market for domestic wool, therefore, continued to be furnished by domestic manufacturing. But this market was far more important than before the Revolution, especially in the South, where as large a percentage of the family needs seems often to have been thus supplied as was the case in the North. It is said that in Virginia, where before the war seven-eights of the clothing supply had been bought, the household industry supplied three-fourths of the people's needs in the decade after the cessation of hostilities (31). It is estimated that in 1790 from two-thirds to four-fifths of the clothing worn was manufactured in the households in many parts of the country (32). "With few exceptions the spirit of a self-dependent industry animated more or less every household." This represented an expansion in the wool market over that of colonial times, but it was a local market only, and did not encourage the growing of wool as a commercial proposition. The enterprise remained merely part of a self-sufficing economy.

LOCAL DEPRESSION IN SHEEP AND WOOL GROWING (1793-1808).

Although the number of sheep had decreased somewhat during the War of the Revolution (32A), this falling off undoubtedly was corrected in the years immediately thereafter, as indicated by the increased importance of the household industry. Following 1793, however, the sheep industry in some sections suffered a relapse. This was due principally to a growth in foreign trade. Former restrictions on American trade, which had virtually eliminated the United States from foreign markets, were no longer a serious deterrent after 1793, when war began between England and France. The foreign market picked up at once, and prices for farm products in general advanced enormously. Though exposed to some dangers on the sea, American agricultural products, other than those of the sheep industry, found a ready market at high prices (33). Farmers close enough to waterways therefore neglected sheep and concentrated on enterprises whose products were in greater demand. Sheep, as yet relatively unimportant, thus were forced farther into the background as a farm enterprise in many localities within easy reach of the seaboard. In view of the crude transportation facilities then existing, however, this depression in the sheep industry would seem to have been decidedly a local condition. The number of sheep in the country as a whole probably did not decrease, since population moved steadily westward, necessarily carrying along the self-sufficing economy. At the same time a very large part of the seaboard section was too far from market to engage profitably in the production of bulky or perishable products and was forced to continue the old system for economic reasons.

THE "OTTER" SHEEP.

During this time the "Otter" or "Ancon" sheep originated. The progenitor of this monstrosity was a sport, a ram dropped in the flock of Seth Wright, near Boston, in 1791. The body was unduly long, or seemed so from the exceedingly short legs. The forelegs were crooked outward like the human elbow, whence the appellation "Ancon." The original ram was unable to move faster than a walk, could not jump fences, and for that reason was bred to Wright's ewes. He bred true to type and the Otter sheep became somewhat diffused in New England, where fence-jumping proclivities were not valued. They never became very popular, however. So far as is known, the last representatives of the breed, a flock of eight head, were located in Rhode Island in 1876 (34).

LOCAL EFFORTS FOR BREED IMPROVEMENT.

Although the farmers in general were indifferent to any attempt to improve the common sheep of the country, this could not be said of many public-spirited men who actively interested themselves in that project. Theirs was a thankless task, but it was willingly pursued through patriotic motives. It has been stated that at that time the American sheep in general, while showing local differences, was very like a coarse, unimproved Leicester. In some sections it also was likened to the old, unimproved Southdown. There was a wide admixture of blood in the common animals of the country (27).

George Washington was a leader in sheep improvement. He was a careful breeder and, with the aid of some of Bakewell's "New Leicester" blood, secured in lambs bought from friends who were able to import the English breed in spite of the British restrictions, he wrought a striking improvement in the Mount Vernon flock. In 1788 he had a flock of 800 head which clipped an average of 5½ pounds of long wool per head, wool adjudged equal to the Kentish clip by a qualified English critic. The Mount Vernon animals deteriorated rapidly after Washington became President, owing to his almost continuous absence in Philadelphia and New York. In 1797 there were only 200 head, and the wool clip averaged only 2½ pounds. This fact merely illustrates the habitual disregard of quality and selection for improvement by the general run of farmers at that time. President Washington's farm manager was undoubtedly a good farmer, but he lacked the personal interest necessary to maintain or continue the improvement already made.

After his return to Mount Vernon, Washington began to breed up his sheep again, and among other good animals secured a pair of fine Persian sheep for that purpose, but the General's untimely death ended his efforts before anything had been accomplished along this line.

On the disposal of the Mount Vernon flock in 1802, the grandson of Mrs. Washington, G. W. P. Custis, of Arlington, seems to have taken the lead among the sheep improvers of the time. He secured some of the best of the Mount Vernon flock, including the Persian ram and two pure Leicester ewes, and before long had a well-known strain of animals called "Arlington Improved" or "Arlington Longwools." In 1803 he instituted the Arlington Sheepshearing, an annual affair held thereafter for a number of years. Among others, prizes were offered for the best sheep, and many good animals were exhibited each year. From the records it would seem that for several decades no one was able to surpass the clip of the Mount Vernon flock at the time of Washington's first inauguration, particularly when the size of the flock is considered. The Arlington sheep were widely diffused among

the southern gentry, but with the introduction of the Merino they soon passed into the background (28).

Another strain which attracted considerable attention at the beginning of the nineteenth century was the Smiths Island sheep, a wild strain first noticed about 1800 on Smiths Island in the Atlantic, just east of Cape Charles. Evidently they were the progeny of common Virginia or Maryland animals placed there by their owners long before, just as cattle, horses, and hogs had been so placed by or soon after 1800. Among the original animals there must have been some English or Irish longwool blood, as the fleece of the wild strain was from 5 to 9 inches in length. At the time many persons became enthusiastic over these animals, but they received no more attention after the introduction of the Spanish Merino (28A). None of the above-mentioned strains interested the majority of the farmers, who desired animals requiring a minimum of care and feed, and which clipped a coarse, strong wool suited to the local domestic needs.

In addition to the forementioned efforts to raise the standard of our sheep, heterogeneous local infusions of foreign blood into the flocks in colonial and later times had resulted from spasmodic importations by sea captains and others, but with small effect in most cases and little or no permanent effect at all. The most striking of these infusions was the introduction of Tunis or broad-tailed Barbary sheep just before 1800. The good mutton qualities of this type gave them a temporary vogue in Pennsylvania, whence they spread somewhat, principally southward. But the Merino craze, which presently (1807–15) developed, and the difficulties in breeding the broad-tailed animals, together with the increasing popularity of the improved English mutton breeds then and thereafter, displaced the Tunis sheep in the popular estimation and they virtually disappeared in a short time (28B).

Much had been accomplished in England by 1770 in the way of getting earlier maturity and greater weight of carcass and fleece, largely through the more or less general adoption of clover, cultivated grasses, and turnips into the British cropping systems. But the improved English mutton breeds owe most of their excellence to the revolutionary breeding improvements of Bakewell and his disciples. Bakewell's New Leicesters placed their stamp on most of the valley (vale) types in England by or soon after 1800, were also used on many of the smaller down (hill) types, and even somewhat on the mountain sheep. Ellman and Webb did with the Southdown what their illustrious contemporary and teacher did with the Leicester. Small numbers of these improved English breeds were imported prior to and for some years following 1800, in spite of English prohibitory export regulations. Although of considerable impor-

tance, this influx of mutton blood was very small compared to that which occurred in later decades, when the breeder's art in England had been further refined and its sphere of activity greatly extended.

ADVENT OF THE MERINO.

The most noteworthy achievement of the early improvers was the introduction of the Spanish Merino. This breed first appeared in this country in 1793, when William Foster smuggled two ewes and a ram out of Spain and took them to Boston. Having to go abroad again in a short time he gave them to Andrew Craigie, of Cambridge, who butchered them, having no idea of their value. Craigie paid $1,000 for a Merino ram a little more than a decade later.

In 1801 Dupont de Nemours and M. Delessert, a Paris banker, sent over four Merino ram lambs, three of which died on the voyage. The fourth—"Don Pedro"—one of the finest Merinos ever imported, did much to better the flocks of his different owners. In 1802 Robert Livingston, a prominent farmer and statesman of the State of New York and at that time Minister to France, sent two pairs of Merinos to his estate on the Hudson. They came from the National flock at Chalons, France, and were typical of the Merino breed, not yet having been modified greatly by the French system of breeding. In 1802 Col. Humphreys, Minister to Spain, sent a flock of 100 Merinos to his home in Connecticut. The flock contained 25 rams and 75 ewes, but 4 rams and 5 ewes died en route. It is believed that the blood predominating was that of the Infantado "cabana" or flock. In 1801 Seth Adams, of Dorchester, Mass., who later emigrated to Ohio, imported a pair of Spanish Merinos by way of France, and was voted a premium of $50 by the Massachusetts Agricultural Society for being the first in the State to do so. Col. Humphreys was voted a gold medal of that value at the same time. A few more Merinos were landed at various ports during the first decade of the nineteenth century, but the breed in general was but little valued by farmers until 1808.

These fine-wooled sheep had little or no effect on the common animals of the country (35). Any fine wool which was needed by the half dozen small mills operating in 1807 was imported free of duty (36), and there was no economic ground for an attempt to supply this trifling demand with a home-grown product. In general it seems quite safe to say that the common sheep of the country were of the same quality at this time as those of a century earlier, and that they occupied the same place in the farm economy—that of a minor enterprise supplying purely home needs. Outside of the domestic industry the market for wool was practically non-existent, and wool was the principal object for which sheep were kept. Farmers in

general kept only enough sheep to supply wool for their household needs, with an occasional small amount for sale or barter at the local store (36A). The flocks rarely were allowed to enlarge. The typical New England farm flock in 1800 contained from 10 to about 20 animals. The average clip was about two pounds per fleece. Prior to 1807 common wool sold for 25 cents or less per pound (51A).

SECOND PERIOD (1808–1830).

WOOL GROWING BECOMES A COMMERCIAL ENTERPRISE.

EFFECT OF TRADE RESTRICTIONS ON THE WOOL MARKET AND THE SHEEP INDUSTRY — MULTIPLICATION OF WOOLEN MILLS — EXPANSION OF HOUSEHOLD MANUFACTURES.

The year 1808 witnessed a striking change in the status of the sheep industry. European restrictions on American commerce were followed by our Embargo Act of December, 1807 (37). Woolen mills began to multiply very rapidly to supply the demand for grades of cloth better than homespun, hitherto supplied by importation (38). At the same time the domestic industry grew very rapidly, with regard to both quantity and quality of output. This was due in part to encouragement in the form of premiums and prizes given by the various States (39). When the embargo was replaced by the Non-Intercourse Act of 1809, the situation remained virtually unchanged, as this act was directed against Great Britain and France. Factories continued to multiply, and the market for raw wool to improve. Only a few of the mills were engaged in fine cloth manufacture, the majority producing coarser fabrics (40), but the supply of fine wool was entirely inadequate even for the existing demand. The fine wool used in the new factories making the higher grades of fabrics came almost entirely from the Merino sheep previously imported from Spain and France, and from their offspring, and a few men who had secured them reaped large profits.

In the spring of 1808 Livingston, then chancellor of the State of New York, clipped 29 common ewes, 83 half-blood Merino ewes, 30 three-quarter bloods, 27 seven-eighths bloods, 7 full-blood ewes, and four full-blood rams, besides 74 half-blood wethers. From the common ewes he clipped 3 pounds 15 ounces of wool per head, twice the average clip of the time. The grade Merino ewes gave an average of 4.9 pounds of wool per head, and the full bloods 5 pounds 2 ounces, all unwashed. The rams averaged nearly 8 pounds each, and the grade wethers a little over 5 pounds. The common wool sold for 37½ cents per pound, the half-blood clip for 75 cents, the three-quarter blood for $1.25, the seven-eighths blood for $1.50, and the pure Merino wool for $2 per pound. With prices like these Merino sheep were in demand. Livingston was then selling his rams for

$150 each. For a choice ram of his own raising he refused $1,000. Half-blood rams and ewes brought him $12 each, while the common sheep of the State sold for $2 each. In 1810 the average clip of his flock was somewhat larger and brought the same prices as noted above (41). His flock later did much to improve those in western Massachusetts and Connecticut, as well as in the State of New York (42). By 1810, the price of Merino sheep had risen greatly, $1,000 per head often being paid for pure-bred rams. Livingston sold several at that price while Humphreys sold two rams and two ewes for $1,500 each, besides a number at lower prices. Occasional fresh importations frequently brought $1,000 per head. (Ewes often sold for that price, pure-bred rams selling for $1,000 to $1,500 each) (43). It is stated that one ram sold for $3,000 during the height of the craze for these sheep.

SHEEP IN 1810.

Not only the market for fine wool, but that for all wool was greatly improved after December, 1807. The former ready market for general farm products was gone, cloth was with difficulty imported, capital was idle to a considerable extent, and wool prices were soaring. Men, of course, turned their attention to sheep and the number of animals began to increase immediately. The earliest known estimate of the total number in the country was made in 1810, when there were about 7,000,000 sheep in the United States. They clipped an average of 2 pounds of wool per head (43A).

The census return for 1810, admittedly incomplete, gave 24 woolen mills in operation, their ouput selling at $1 to $10 per yard. Their total production was placed at 200,000 yards. The returns for the household manufactures were still more incomplete, but the output returned was 9,528,266 yards of woolen cloth, or practically 98 per cent of the recorded national total (50).

THE MERINO IMPORTATIONS (1810–11)—EFFECT ON THE SHEEP INDUSTRY.

At this time conditions in Spain, owing to the Peninsular wars, became such that the Spanish authorities were eager to dispose of many of the best flocks (cabanas) to prevent seizure and slaughter, and to secure ready money. The American consul in Lisbon, William Jarvis, of Vermont, for several years had been endeavoring to secure some good Merinos, but without success. He immediately took advantage of his opportunity, and in conjunction with other enterprising Americans who followed his lead, a total of 19,651 Spanish Merinos were landed in this country between April 1, 1810, and August 31, 1811.

The earliest importations sold for as much as $1,000 per head, but prices soon fell to from $300 to $100, sometimes less, as the Merino

deluge continued (44). The importations ceased after August, 1811, but the breed was then well distributed throughout this country from Maine to Georgia and from the sea coast into the Ohio Valley. The less wealthy farmers thus were able to lay the foundation for a vast improvement in their flocks, and this began immediately.

The Southern States as a whole were so little interested in sheep raising that this breed secured but slight footing in that section, but the Merino found a ready welcome in the West. In 1807 Seth Adams had moved to Muskingum County, Ohio, taking with him between 25 and 30 Merinos descended from his pair imported in 1801. In 1810 he drove 176 sheep from Col. Humphrey's flock into Kentucky and Tennessee. He was largely instrumental in placing the Merino blood in the Ohio Valley (45). In 1814 George Rapp moved his fine-wooled flock from Economy, Pa., to New Harmony, Ind., in Posey County. The blood of his flock spread slowly through southwestern Indiana, southeastern Illinois, and also into Kentucky. In 1817 George Flower, an Englishman, took 12 fine Merinos to Edwards County, Ill., from his father's flock in England. These were the first in that State, and were bred with great success for many years (46). In 1807 Wm. R. Dickinson, of Virginia, moved to Steubenville, Ohio, where he began to breed sheep in 1812, using Humphrey Merinos for foundation stock, along with some fine animals secured from a prominent New Jersey breeder. He continued in the sheep business until 1830, when his flock was dispersed, following business reverses. He developed a very fine strain of Merinos, one of his rams taking a first prize at Baltimore in 1826 over a fine Saxony buck, in spite of the latter's slightly finer fleece. After 1830 his flock was mentioned prominently by the agricultural press as a factor in the improvement of the Ohio sheep (47).

FURTHER IMPROVEMENT OF THE WOOL MARKET DUE TO STIMULATION BY THE WAR OF 1812—SHEEP TEMPORARILY A MAJOR ENTERPRISE.

The War of 1812 was attended by a mushroom growth in the American woolen manufactures, due to the exceedingly high protection afforded the industry, largely the result of trade restrictions. During part of the war, owing to the blockade of the Atlantic seaports, foreign commerce practically ceased to exist, and our woolen manufactures virtually had a monopoly (49). Almost any kind of factory could make good profits at the prices then prevailing. Broadcloth sold for $8 to $12 and as high as $18 per yard. The Army demand for woolens undoubtedly raised the price of coarse cloth somewhat, and it was necessary to import some cloth for military use. With the increased war demand the household industry produced as much more than the family needs as possible, while

the factory system is stated to have increased two to three fold by 1816 (50A), and the value of the finished product from 4 to 19 million dollars.

The price of pure Merino wool rose to $2.50 per pound during the war, and is stated to have reach $4 per pound locally, although common wool did not rise above 50 cents per pound (51). It is not to be wondered at that the farmer, with a very limited market for his other products, which a few years before had brought very high prices but which now were little in demand, should have gone to an extreme in an endeavor to grow wool, especially fine wool. He had a monopoly of the home market. The number of sheep increased to about 10,000,000 (an increase of 40 per cent) by 1812 (52), and the wool clip was 50 per cent larger than in 1810, when it was not over 14,000,000 pounds (from 7,000,000 sheep). In New Jersey, out of 285,000 sheep reported to the State authorities in 1814, 3,800 were pure Merinos and 25,800 were grades (52B). Any grower of fine wool could make money at the prices then prevailing. Sheep during this period were a major enterprise on a considerable proportion of the farms in the North Atlantic States. There was also a marked improvement in the quality of the animals and their fleece at this time (52A).

DEPRESSION IN THE WOOL MARKET AND WOOL GROWING (1815–1820).

When the country reverted to a peace footing in 1815 the highly artificial character of the woolen industry was exposed. British manufacturers flooded the American market with woolens before the tariff of 1816[4] went into effect, and in spite of the tariff they continued to ship heavily to this country (53). Most of the factories soon shut down or operated but a part of the time for several years. Only those managed with some degree of ability were able to keep going, and many went bankrupt. Conditions were accentuated by the domestic panic of 1819, the effects of which were seen in some sections for three or four years (55).

The household manufacture held its own during this period, however, and probably did more than that with the movement of population westward into the less accessible sections. In New York State alone nearly 6,500,000 yards of woolen cloth, valued at more than $3,600,000, were made in 1825 in the household industry (57). The output of the New England homes was equally extensive. Poor transportation facilities were an important factor in the continued prominence of household manufacturing, and as this was a by-industry on the farm, it was but little hampered by the competition of factory-made goods, owing to the slow application of power

[4] See appendix, table of tariffs on wool.

machinery to the woolen industry (57A). The wool used in such goods continued to be that of the common clip.

With the general depression in factory production, the market for fine wool suffered a tremendous slump, as but a slight demand existed and the fiber could be imported under a 15 per cent duty. The average Boston price for fleece wool in 1815 ranged by grades from 50 cents to $1.50 per pound. In 1816 the average was 20 to 75 cents (54), and within another year Merino wool appears to have sold for no more than 35 to 40 cents per pound, washed (59A). The Merino breed, formerly so popular, accordingly fell into disrepute and was almost entirely neglected for more than a decade after 1815. Only a few of the more farsighted farmers made an attempt to keep the blood pure. The wool market was so poor that no general effort seems to have been made to improve the common sheep or to increase the weight of fleece, and the animals were slaughtered in large numbers for some time after the close of the war, or were driven westward into the new settlements (56). Half-blood Merinos were sold to the butchers for $1.25 per head, and extreme statements have been made as to the extent to which pure-bloods were sacrificed. The quality of the great bulk of the flocks probably declined very rapidly, as the domestic manufacture, which constituted the chief market for wool, largely used only the common grades. In general, within a few years after 1815, sheep once more dropped to the place of a minor farm enterprise Instead of being merely a universal factor in a self-sufficing economy, however, the sheep industry retained the character of at least a minor commercial enterprise in many sections.

TEMPORARY IMPROVEMENT IN THE WOOL MARKET (1821–1826)—INTRODUCTION OF THE SAXON MERINO.

Following 1820, when the stress of the panic abated and the influx of British woolens slackened, the woolen industry began to pick up, and seems to have been in a fairly prosperous condition by 1824, or at least making good progress in that direction, as shown by the increasing volume of raw wool imported (58).

The higher duties under the tariff act of that year (1824) led both manufacturer and farmer to increase their activities (59), and the latter turned his attention once more to fine wool. But he desired to grow the finest wool possible, and paid scant attention to the home possibilities. The much modified Merino of Saxony, which for practically half a century had been bred for a fine, silky fleece, with no attention to constitutional vigor or weight of clip, was then famous as a fine-wooled breed, and broadcloth made from its fleece was a fabric of striking beauty. Our manufacturers had been importing a little Saxony wool for several years, and they encouraged

the farmer to get animals of this type. In 1818 such wool sold in Boston for double the price of Merino wool, and for three times that of the common clip (59A). The price probably was 75 or 80 cents per pound.

Accordingly, the desire to grow fine wool was again given an impetus, but it was not as widespread as in the case of the Merino before and during the war of 1812 (60). Although a few Saxony sheep were imported in 1822 and 1823, the introduction really dates from 1824, when 77 reached Boston in charge of an experienced German shepherd, H. D. Grove, who stated that only two-thirds were full-blooded. All were sold as pure-bloods at an average price of $69.35 per head. Later importations often constituted gross frauds on the American public, animals with little or no pretensions to Saxon blood being sold as purebloods along with quite a number of excellent specimens of the breed. The highest prices paid were $465 for a ram, and $235 for a ewe. One cargo sold for an average of $158.80 per head at Boston. Grove at first had refused to tend this shipment because the average quality was so poor. He was glad that 15 of the poorest specimens died at sea. German and American speculators unloaded a large number of scrubs on the purchasers, though they sometimes lost money. In 1826, when the farmers' expectations from the tariff were not realized, one shipment of low-grade Saxon sheep sold at an average of only $18.64 per head, the German shippers losing $3,000 on the venture. In 1826 a total of 2,288 head of this breed were imported, but only 398 came in in 1827. In this year some Saxony rams sold for as low as $5.25 per head, and some ewes for as low as $6. The highest price then paid for any animal in a number of these shipments was $72. A total of 3,400 were imported from 1824 to 1828, after which the importations ceased. Some farmers had remembered the Merino craze, while a pronounced slump in prices, in spite of the tariff, rendered the outlook for fine wool very doubtful. This slump was the result of conditions in England.

THE ENGLISH CRISIS OF 1826—EFFECT ON THE AMERICAN SHEEP INDUSTRY.

Following the Napoleonic wars there had been a fairly continuous period of stress in English agriculture and industry, and especially in the woolen manufacture. The latter was put under an additional strain by enhanced import duties on the raw material. The duty on wool was placed at 12 cents (6 pence) per pound in 1819. Continual agitation for a reduction of the duty, to favor the manufacturer rather than the woolgrower, bore fruit in 1824, when the duty on wool imported into England was lowered to 2 cents (1 pence) per pound. In 1825 it was placed at 1 cent on wool costing less than 24 cents per

pound, at 2 cents on more valuable fiber. At the same time prohibition of export of British longwools, which had been in force for a long period to protect the worsted manufacture, was removed in the interest of the growers of such wool. Manufacturers of such fiber outside Great Britain were relatively unimportant at that time. American woolen manufacturers saw in the English tariff reduction an attempt to cripple their business, which had been slowly though steadily gaining in strength for several years, and was causing some uneasiness in England. The fact that the reduction occurred at the same time that our import duty on woolens was increased from 25 to 33⅓ per cent strengthened their belief, although the British manufacturers sadly needed the measure. As a result of a largely inflated currency and attendant wild speculation since 1823, however, conditions in England reached a climax in the panic of 1826, and the manufacturers there were forced to dispose of their stocks at almost any price obtainable. America was the most available dumping ground, and English goods were sold in our markets at ruinous prices, often below cost. The foreign shippers gladly paid the duty in order to reduce their stocks. Considerable quantities of woolens imported into this country were the product of mills which had become bankrupt (61).

The manufacturers in this country suffered severely from this abnormal foreign competition. Those specializing in the finer woolens, those who used the Saxon and the finest of the Merino wools, were especially hard hit, and many mills were forced to close down or greatly to curtail their production. In any case the reversal of British policy with reference to the wool trade would have depressed wool prices in this country considerably, but with our mills curtailing their demands to a marked degree, the price of wool fell farther than would otherwise have occurred. In the eastern markets fine wool from January, 1824, to April, 1826, averaged 58 cents per pound (washed Ohio clothing). Medium averaged 43.6 cents.[5] From July, 1826, to October, 1828, fine averaged 42.3 cents and medium 34 cents per pound, a relative gain of 6 cents per pound for medium wool (i. e., the price of medium fiber fell 6 cents less per pound than fine) (62). As was the case after the war of 1812, fine wools again showed the greater loss, and consequently the boom in the sheep industry was short-lived.

Under these conditions the value of the Saxony sheep fell considerably. Merino sheep had advanced slightly in price, not because they were deemed of much intrinsic value, but because it was believed they would make a good cross with the Saxon (63). When prices fell sheep were once more slaughtered in large numbers to get them out of the way, half-blood Merinos along with the common animals.

[5] This and following references to wool prices refer to wholesale prices only.

At the same time they were driven westward in large numbers (64). It was estimated that in 1827, 20,000 sheep were sold in Kentucky from droves passing westward. The price ranged from 37½ to 75 cents per head. A considerable proportion of those bought were grade Merinos.

THE SHEEP INDUSTRY IN 1830.

In 1830 there were probably 12,000,000 or 13,000,000 sheep in the United States (72A), though contemporary estimates place the number considerably higher. This was practically the same number as in 1825 or 1827, when New York, Pennsylvania, and Vermont seem to have had nearly half the sheep in the country (73). The increase since 1814, when the number was estimated at 10,000,000 head, had in large measure resulted from growth in newly settled sections more than counteracting the general decline in the older wool-growing regions. In the latter this decline appears to have been checked in the early twenties. Perhaps there had been a movement in the other direction, but the decline had begun again in 1826 and continued for at least two more years.

The growing factory manufacture of the coarser woolens had become important by 1830, the producers of such goods suffering less from English competition in the later twenties than the manufacturers of fine woolens, but the chief market for coarse wool still appears to have been furnished by domestic industry, with the factory demand making rapid strides and steadily gaining on its household competitor. The market for coarse and medium wools had been fairly good when compared with that for fine wools, as indicated by smaller fluctuations in the price of the coarser fiber. In 1830 at least one-half of the domestic wool clip (which is said to have totaled about 32,000,000 pounds, but probably was no more than 25,000,000), was used in the thriving household manufacture (74).

This, considered in connection with the number of sheep, not only indicates that sheep as a farm enterprise had on the whole made little or no gain in the preceding decade and a half, but that they had in general constituted but a minor enterprise in the farm economy in a large part of the country. The animals had been kept principally for wool, and the bulk of the wool in most sections utilized in a by-industry which offered profitable work to the farm family.

THIRD PERIOD (1830–1845).

THE EAST SUPREME IN WOOL PRODUCTION.

RAPID GROWTH OF WOOLEN MANUFACTURES—THE WOOL MARKET GREATLY STRENGTHENED—GROWTH OF EASTERN FLOCKS.

Following 1830 conditions were changed. A general application of power and introduction of improved machinery greatly lowered the

cost of cloth manufacture, and the tariff of 1828 had a marked stimulating effect on woolen manufactures after a year or two (66). Necessities of the English manufacturers caused them to maintain their cut-throat competition until 1830, by which time foreign conditions were mending rapidly. The period of prosperity which set in at that time (67) was attended by a rapid growth in woolen manufactures, and steady inroads were made by the American factory product into the market formerly supplied by the household industry. In 1835 the household manufactures of New York turned out nearly one-fourth less woolens than in 1825. This was in large part due to growth of the urban population, which drew on the factory-made goods (76). When transportation facilities improved, the domestic by-industry lost ground very rapidly.

By 1837 the woolen manufacture of the country had doubled in output since 1830 (83), and the wool market was based very largely on the factory demand. Large quantities of wool were now imported, nearly all of it of a grade valued at less than 8 cents per pound and free of duty (84). This wool did not compete with the domestic clip, while the imports of manufactures of wool which did so compete show a relative decrease (85). The average net annual imports[6] of raw wool from 1822 to 1831 were a trifle less than 2,000,000 pounds. The average value was nearly 21 cents per pound. During the following 11 years the average net importation was nearly 8,300,000 pounds, the average value practically 9 cents per pound. The increase in average annual net imports was 315 per cent. This decade marks a pronounced growth of manufactures of finer woolens, the great bulk of the raw material for which was of home growth. The preponderance of cheap wools in the imports is indicative of the growth in manufactures of coarser materials (86).

With the woolen manufactures growing so rapidly, an important change in the status of the sheep industry took place in the East, and the eastern flocks increased rapidly after 1830. They became quite generally a major enterprise in many sections east of the Alleghenies. A contemporary estimate, admittedly low for several sections, placed the number of sheep in 1837 at nearly 13,000,000. Consideration of this estimate in connection with the census figures for 1840 would lead to the conclusion that owing to mistakes of omission there were about 18,000,000 sheep in the country in 1837 (80). Of these New York had at least one-fourth, and New York, Pennsylvania, and Vermont had at least one-half. The average clip per fleece was probably about 2 pounds. Western wool as yet was not an important factor in the eastern market, owing to difficulties of transportation, and the rapidly growing factory demand for wool

[6] Gross imports of raw wool less exports of imported wool.

during the thirties had to depend almost entirely on eastern or imported wool for its supply.

The price of the clip of 1836 rose to 70 to 72 cents per pound for fine Ohio washed wool, 60 to 63 cents for medium, and 47 to 50 cents for coarse (77). Wool growing was considered the most profitable enterprise on the farm in parts of the East by 1835 (78). In some cases farmers devoted all their energies to wool growing, to the exclusion of other enterprises, and cultivated only enough land to secure feed for their flocks and work teams. Dairying was often replaced by sheep at this time (79). Some general attention was also paid to improvement of the quality of sheep and fleece. The panic of 1837 hurt the woolen factories considerably, and the price of wool fell, though fine Ohio washed wool averaged a little over 54 cents per pound from 1837 to 1840, medium nearly 47 cents, and coarse a little over 37 cents (81). The annual reductions in duties under the existing tariff probably had an appreciable effect on this decrease. But although sheep and wool were less profitable after 1837, the number continued to increase in the East, though more slowly, because of the remunerative price of wool, and in spite of high prices for other farm products following harvest failures in 1836–1839 (82).

REVIVAL OF THE SAXON BOOM—SUBSEQUENT REPLACEMENT BY THE MERINO.

Along with the change in status of the sheep industry in the East there also occurred a change in the breeding operations. The popularity of Saxon sheep had revived after the tariff of 1828, and 550 more animals were imported, but thereafter the importations ceased. The numerous advocates of the breed drew on the domestic supply, and the existing Merino and common flocks were extensively crossed with the Saxon (65).

But although the price of wool had advanced considerably since the decline of the later twenties, the price of the fine wool fell far short of earlier expectations. After 1826 it rarely sold for more than 10 cents per pound higher than medium wool, often less than 10 cents, and sometimes much less. The Merino gave 50 per cent more wool than the Saxon, the Merino fleece was worth more on the market than that of its feeble competitor, and it cost less per pound to produce it (68–69). Men who had crossed their Merinos and Merino grades with the Saxons found that they clipped much less wool from an enfeebled progeny, animals which were poor nurses, of low fecundity, and but poorly fitted to survive in our somewhat "rough and ready" system of farm management. The puny pure-blood Saxons were even less adapted to American conditions (70). It was not long before the more far-sighted breeders discarded the Saxon cross as

far as possible, and worked for the improvement of their remaining Merinos. A controversy as to the relative merits of the Saxon and the Merino waged for a decade after the early thirties, but the Saxon advocates soon found themselves in a minority. The Merino quickly found favor for "breeding up" the Saxon for a heavier clip, the status of the breeds being completely reversed (71). Wm. Jarvis, one of the largest breeders of Merinos for a generation, had adopted Saxons in 1826, after considerable persuasion by the New England manufacturers, but he got rid of the blood as far as possible soon after 1832 (72). The old "common" stock of the East had been so generally crossed with the Merino and Saxon that the former characteristics of that primitive type had almost disappeared before 1840 (87).

THE SHEEP INDUSTRY IN 1840.

The census of 1840 placed the wool clip at nearly 36,000,000 pounds, from 19,311,000 sheep[7] then in the country. Of these, nearly 60 per cent were in the New England and Middle Atlantic States (85A). The Northwestern States had 3,500,000 head, 2,000,000 of which were in Ohio. Kentucky, Tennessee, and Virginia contained 3,000,000 of the 4,500,000 sheep in the South. In 1845 the number of sheep in the country was estimated at 25,000,000 (117A), but this figure would appear to have been somewhat exaggerated.

The decade and a half following 1830 clearly marks the period of supremacy for the eastern wool grower, but changing economic conditions quickly forced a readjustment in the industry.

FOURTH PERIOD (1845–1860).

THE WESTWARD SHIFT IN WOOL PRODUCTION.

EARLIER HANDICAPS—TRANSPORTATION DIFFICULTIES—LACK OF CAPITAL.

Until about 1840 the West had produced wool primarily for home needs, but little of the clip appearing in the eastern markets. What little did appear was largely of a coarse quality, which seems to have brought a higher price in the Eastern States than west of the mountains. On the other hand, local mills in the West, protected to some extent from foreign competition by the mountain barrier, had paid better prices for fine wool than prevailed on the Boston market. Fine wool had often been sent westward to Steubenville, Ohio, from parts of the East (88). Obviously such wool would not usually be sent eastward under these circumstances. Very little wool from west of the mountains came eastward until after the opening of the Erie

[7] Except in 1850, all censuses until 1900 undoubtedly included a small percentage of pring lambs in the returns.

Canal in 1825, and but a small amount by that route during the following 15 years (89). Most of the sheep in the West were in the Ohio Valley, and a long haul was necessary to deliver the wool to the lake carriers. Accordingly the Erie Canal was of little use to the western wool grower for some time. Following the opening of the Ohio and Pennsylvania canal systems in 1832–4, transportation facilities were very much improved, but without much effect on the movement of wool until the early forties (90). Most of the wool which passed through the Erie Canal prior to 1843 was grown in western New York. Thereafter the clip of the Middle West became an important item in the canal freights (90A). Twenty-eight times as much western wool was carried on the Erie Canal in 1845 as in 1840 (nearly 3,000,000 pounds as against a little over 100,000 pounds).

Another factor in holding back the development of the sheep industry in the West was the aftermath of the panic of 1837. Credit was curtailed for several years, and what could be obtained was used in buying land, as had been the case before the panic (91). It required but little capital in prairie sections to secure teams and implements to break the land for grain, but funds for investment in live stock were lacking. To keep sheep profitably some improvements were necessary. Accordingly live-stock enterprises of any magnitude were postponed by most settlers in the regions then being opened (92). At the same time the accelerated westward movement of population during the late thirties and early forties strengthened the local market for wool west of the mountains, and thus it was some time before there was an appreciable surplus for eastward shipment, save from the older sections in the Ohio Valley.

FACTORS FAVORING THE DEVELOPMENT OF THE WESTERN SHEEP INDUSTRY.

LOW PRICES FOR GENERAL FARM PRODUCTS—HIGH COST OF TRANSPORTATION—RELATIVE EASE OF WOOL TRANSPORT.

Following 1840 there was a decline from the high prices for general farm products which prevailed during the series of poor harvests of the later thirties. From 1840 to 1846 the price of wheat and flour in New York averaged nearly 40 per cent lower than from 1836 to 1839. In Chicago wheat sold for 20 to 70 cents per bushel, generally below 60 cents, from 1840 to 1844, going as low as 20 cents in 1843. Oats sold in the same market for 15 to 37 cents per bushel, usually below 30 cents, and for only 15 to 16 cents in 1842. Corn sold for as low as 15 cents in 1843, though the price usually was well above that during the early forties. In New York corn sold for 48 to 51 cents in 1844–45. In central Illinois corn sold for 10 cents a bushel in

1840, and corn for 16 cents and oats for 12.5 cents in 1842. Concentrated products like beef and pork sold in the western markets for from 2 to 3 cents per pound, and it cost that much to send them by land and water to New Orleans. Hogs brought $1.75 to $2.50 per hundred pounds in Cincinnati in 1842–43 and $1 to $2.50 in Chicago. Beef sold for $2.25 to $3.25 per hundred pounds in Cincinnati in 1843–44 (105).

The estimated cost of hauling products overland was 15 cents per ton-mile, or nearly half a cent a mile per bushel for wheat. It cost about 20 cents per bushel to ship wheat from Buffalo to New York on the Erie Canal, quite aside from the cost of getting the grain to Buffalo. It probably cost close to 50 cents per bushel to lay down wheat in New York City from a point 25 to 30 miles from a waterway in central Ohio. The difference between the Chicago and New York price of wheat was 57 cents per bushel in 1840–41, the price of spring wheat averaging 45.1 cents and winter wheat 63.5 cents in Chicago, $1.063 and $1.165 in New York (106). The cheap and bulky agricultural products of the West were to a considerable degree excluded from the eastern markets by the high cost of transportation, save from localities fairly close to waterways, and the growing southern market was unable to absorb the marked increase in production which was taking place.[8]

In general, there appears to have been but small profit in most farm enterprises in the West at the time, except in favorable situations. For instance, men at Bloomington, Ind., hauled their wheat 90 miles to Louisville in the fall and, in exchange for a wagon load, considered themselves fortunate to secure enough sugar and coffee to supply the needs of the family (106A). Except from localities situated within about a day's haul from a waterway or railroad, eastward shipment of the bulkier farm products appears not to have been profitable ordinarily, and but a small part of the Middle West was so situated until the later forties.

On the other hand, however, it cost but $2\frac{1}{3}$ to $2\frac{1}{2}$ cents to ship a pound of wool from central Illinois to Boston, where grades from fine to coarse Ohio washed wool sold for from 53 to 23 cents per pound during the forties (106B). One pound of the cheapest wool, therefore, carried 10 pounds to market, while a pound of the best carried 20. The time evidently was ripe for a marked growth of the sheep industry in the Middle West. Wool could profitably be

[8] There were less than 700,000 inhabitants in Alabama, Mississippi, Arkansas, Oklahoma, Texas, and Louisiana in 1830, and 1,416,000 in 1840. In 1830 there were 1,470,000 inhabitants in Ohio, Indiana, Illinois, Michigan, and Wisconsin, and 2,925,000 in 1840. The producers in the last section increased twice as fast, numerically, as their chief customers.

grown up to 200 miles from a shipping point and over $1,000 worth be drawn to the place of embarkation with a two-horse team (106C).[9]

LOW COST OF WESTERN VERSUS HIGH COST OF EASTERN WOOL PRODUCTION.

Another factor in favor of sheep in the West was the difference in cost of wool production. It was estimated that the annual cost of keeping a sheep in the East was from $1 to $2 per head for a considerable period prior to 1860. The estimated cost in the West ranged from $1 down to 25 cents (95). Henry Randall, dean of eastern flockmasters, stated that either the wool or the lamb and manure paid for the annual keep of a ewe. The latter appears to have been the more common reckoning among some eastern sheepmen, while others offset the lambs against all other charges except feed and reckoned on a profit from the wool above the cost of the feed (95A). Randall estimated that it cost 88 cents per head to keep sheep a year in 1850 in flocks of 300 or more. Eastern farmers usually reckoned on $1 or more a head in small flocks. If such items as depreciation and repairs on fences and buildings, cost of litter, full cost of labor, of supervision, and of extra labor at lambing were included, the cost per head per year in large flocks was very close to $1.50. In small flocks it was considerably higher on many items, but the total annual cost was not necessarily higher. Accepting the balance of Randall's figures (although his percentage of lambs raised, 80, is certainly generous for large units), the return on large eastern flocks, except in districts most favorable to sheep, probably was but little above the

[9] In 1840 there was comparatively little through or interstate shipment of freight. The Ohio canals, however, were of great help to those who could use them, and the canal eastward from Pittsburgh was of considerable value to western Pennsylvania, though of relatively little benefit to settlers farther west. The necessity for partial transshipment when the boats were hauled over the divide between Johnstown and Hollidaysburg, and for complete transshipment at Columbia for freight consigned to Philadelphia, made the cost of transportation prohibitively high save for concentrated products. The westward shipments over this route were always far in excess of those moving eastward, owing to the character of the freight, and in great contrast to traffic on the Erie canal, where eastbound shipments were usually four times as large as those going in the opposite direction. In 1840 it cost $1.55 to ship a barrel of flour from Pittsburgh to Philadelphia via the Pennsylvania route, as against 68 cents from Buffalo to New York via the Erie canal, from 1840 to 1845. The great bulk of the freight of western origin either went down the Mississippi to New Orleans or northward to Buffalo. Until 1851, 97 per cent of the beef and flour, and 96 per cent of the corn shipped from Cincinnati went down the river. The few short lines of railroad in the Middle West in 1840 (less than 200 miles in all) were of little general value in facilitating freight movements, and until well toward 1850 the gradual growth of railway mileage in that section had small effect on the transportation facilities as a whole, though very valuable locally. It was not until 1848 that the gap was closed between Bellefontaine and Springfield, Ohio, and the line from Sandusky to Cincinnati completed. Southern Michigan and adjacent areas in Ohio and Indiana were better served by the railways in the later forties than the remainder of the Middle West, save for a belt across Ohio from Sandusky to Cincinnati. Until well past 1850 the great bulk of the freight from the Middle West moved out via the waterways, for which the railways served as feeders. The opening of the enlarged Welland Canal in 1845 subjected the Erie route to severe competition and forced a marked reduction of transportation charges. Freight shipments eastward were thus encouraged and a marked gain occurred in the western tonnage via the Erie canal during the forties (107).

value of the manure. Randall's percentage of lambs raised is seriously open to question, because the large flocks usually contained a considerable proportion of wethers. Outside of the most favorable situations, on land which carried three sheep per acre and with wool in the market centers averaging 40 cents or less per pound, most wool growers in the East probably netted less than 75 cents per acre (25 cents per sheep), aside from the manure. The cost of keeping sheep in the East was at least twice as great as in the West. In Vermont in 1840 it was estimated that for some years previously the net income on the capital invested was seldom over 6 per cent, and but few flocks returned gross receipts (above losses) of as high as 25 per cent. In many flocks such receipts amounted to no more than 10 per cent of the total investment (108). For some years prior to 1850 many New York farmers figured that they had been keeping wool sheep at a loss, as the wool had not paid for the feed at $1.34 per head per year. The clip per head probably was about 3½ pounds for these sheep. Many New York farmers claimed that in 1850 it cost 40 cents per pound to produce merino wool (104), which was only 5 cents less than fine wool sold for in Boston. Other cost estimates were considerably lower (69).

WESTWARD MOVEMENT OF SHEEP.

Resulting from the foregoing factors, as pioneer finances worked back to normal in the early forties sheep increased very rapidly west of the mountains, and wool shipments to the Atlantic seaboard placed the cheaper western clip in serious competition with that of the East (94). The accelerated westward movement of sheep in the early forties was likened to a "tornado" (96). In 1844 it was stated that not less than 50,000 sheep were driven into the West from one section the previous year (97). Ohio, as well as States farther eastward, was drawn on heavily by settlers in the western States who desired sheep, and emigrants from the East were particularly desirous of securing them. In 1843 half-blood Merinos were bought in Ohio for 50 to 87½ cents each. One man bought 500 head for an average of 63¾ cents each, and drove them to Lake County, Iowa, for 24 cents per head. At that time sheep sold in the prairie States for $1 to $2 each (99). Owing to the western demand, the price of sheep in Ohio doubled within a few weeks in the summer of 1844 (98).

Sheep began to take a position of prominence in Wisconsin in the late forties and early fifties. The census gave that State only 125,000 head in 1850. In 1845 there were not over 30,000 head in the State (93). Large numbers were driven into Wisconsin from Pennsylvania in 1844–45.

It was claimed that 50 per cent of the sheep driven into the prairie States from eastern regions died the first year (100), and during the

forties it was often stated that the western prairies were not suitable for sheep; but the agricultural press of that region gave such claims scant courtesy. The western country was said to be ideal, if suitable care and feed were given (101). The great trouble was heavy losses of stock, and discouragement, before the sheep became acclimated. Poor shelter, or no shelter, and poor feed were prominent causes of loss to careless shepherds (102). On the other hand, there was abundant free range, though it became dry fairly early in the fall, but western flockmasters could often have wild hay delivered at their pens for $1 to $1.50 per ton (103). Considering all the facts, it is not at all surprising that the eastern farmer despaired of competing with western wool after the middle forties.

DECLINE IN THE SHEEP INDUSTRY IN THE EAST.

As a result of the above a pronounced decline in the number of sheep occurred in the East between 1840 and 1860, particularly between 1840 and 1850, and the West gained as fast as the East lost. In general, land values and feeding costs were too high east of the mountains to permit woolgrowing alone to continue profitable, and so far the production of wool had been the chief aim of the eastern flockmaster. His profits were very low, and flocks in the North Atlantic section were broken up rapidly. Men growing wool on land better suited to other uses abandoned the enterprise as the increasing urban population and changing economic conditions enabled the eastern farmer to produce other things with which the West did not compete so severely (109). This was especially true of the products of the dairy (109A). Most of the decline in the East appears to have occurred after 1845, when the number of sheep in the country was estimated at 25,000,000 (117A). In one county in Vermont the number of sheep decreased between 15 and 20 per cent during the summer of 1847 (108). At that time western wool was making great strides in dominating the eastern market, and the outlet for other farm products was enlarged considerably. The substantial decline in duties on wool in the tariff of 1846 had a discouraging effect on the eastern woolgrower, but the real cause would appear to be as indicated above; sheep appear to have declined because wool sheep as such were without an economic basis in most of the East. Prices for other farm products rose rapidly after 1846, while wool stayed until 1851 at virtually the same level as during the early forties. Other means of making a livelihood were present, and the eastern farmer took advantage of them at the expense of his flocks, save in situations most favorable for the production of wool (117).

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THE SHEEP INDUSTRY IN 1850.

In 1850 there were 21,723,000 enumerated sheep in the United States, of which only 7,900,000 (or 36 per cent) were in the New England and Middle Atlantic States, instead of 11,250,000 (or nearly 60 per cent) in 1840. In 1850 New England had but a tenth of the total instead of nearly 20 per cent as in 1840 (a little over 2,000,000 as against nearly 4,000,000 head). Pennsylvania was the only eastern State where the number increased, due to growth of the flocks in the western counties. Practically a third of the sheep in 1850 were in the North Central States. If Tennessee, Kentucky, and Virginia (where a large part of the sheep were located in what is now West Virginia) had been grouped with the North Central States, that section would have had practically one-half of the total number in the country. Subsequent study of the census figures has led to the belief that there were about 2,500,000 sheep in the country which escaped enumeration in 1850, and that these animals were distributed in approximately the same ratio as the enumerated sheep, making a total of about 24,000,000 animals (118). It has been estimated that California had 1,000,000 head at that time (1850), nearly all of which escaped the census. This California figure, however, is undoubtedly much too large, as the flocks in that State were just beginning to increase again after having been almost obliterated following the secularization of the missions in the thirties. In 1850 the number in that State was relatively small and over half a million were driven in from New Mexico during the following decade, besides many thousands brought from the Eastern States (119). It is probable that not over 1,500,000 animals were missed by the enumerators in 1850, making a total of 23,223,000 head.

THE SHEEP INDUSTRY IN 1860.

In 1860 the census reported 22,471,000 sheep, while a trifle over 1,500,000 were estimated to have escaped the enumerators, making the total in the country practically 24,000,000, or but 3 per cent more than were present in 1850 (122). New England had nearly 1,900,000 head, or 7.9 per cent, and the Middle Atlantic States a little over 4,500,000, or 19.3 per cent. That is 6,500,000 head, or a trifle over one-fourth of the total, were in the wool-growing States of the East. The North Atlantic Division, therefore, showed a further decline, both absolute and relative, since 1850. The North Central States still contained practically one-third, the number there having increased but slightly. Most of the limited increase in numbers which occurred in the Middle West was in the newer States or sections, principally in Michigan, Missouri, Wisconsin, and Iowa. Considerable numbers were driven to Texas (128) and, as already noted, to

California. In Tennessee, Kentucky, and Virginia the number was slightly less than in 1850, while there had been an increase in the Central West and a pronounced gain in the Far West, notably in New Mexico and California. These two territories then contained over 2,000,000 head as against less than 400,000 enumerated animals in 1850. Their wool clip was just beginning to appear on the eastern market in appreciable quantities.

CHARACTER OF THE WESTWARD SHIFT—PARTS OF THE MIDDLE WEST ASSUME EASTERN CHARACTERISTICS BY 1850.

The westward shift was characterized by a partial abandonment of the enterprise in the East and its general adoption in the West, rather than by any great gain in total number of sheep following 1845. In the fifth decade, more particularly between 1846 and 1850, sheep in the Eastern States and locally in the West were slaughtered by thousands for their pelts and tallow or disposed of in droves to rendering establishments. Such disposal also occurred between 1850 and 1860, but to a less degree (134). Wholesale sacrifices of sheep were noted in Ohio in 1844 and 1850 owing to a temporary shortage of feed following a slump in wool prices. In parts of that State, the stronghold of wool growing in the Middle West, sheep were even said to have been kept at a loss after the middle forties, though in most localities the sheep industry in Ohio was quite flourishing (135). In southern Ohio beef cattle displaced sheep in considerable numbers (136). Parts of Michigan had the same experience as Ohio. Sheep had become prominent in the southern part of the State by 1850, and in 1852 farmers were selling pelts at $1 each and tallow for 10 cents per pound (137).

CHANGE TO MUTTON TYPES IN THE EAST—THE FRENCH MERINO.

Not only did sheep become less numerous in the East following 1845, but the character of the animal gradually underwent a change. Sheep had been kept for mutton as well as for wool before 1800, though in very small numbers. Mutton crosses became fairly numerous locally after 1815, and this change to both wool and mutton had been progressing slowly (110). It was claimed that pure-bred Leicester rams were rented for as high as $150 to $200 per season in Pennsylvania as early as 1810 (110A). After 1840 the change took on an added impetus, particularly in sections near or within fairly easy reach of the large cities (111). At one county fair in Massachusetts in 1847 all the sheep exhibited were longwools (110B). As the quality of the mutton improved, owing to the crosses with mutton breeds and disposal of the animals at a more acceptable age, the demand for mutton increased. This would have occurred inevitably

in answer to the urban demand, but the demand was accentuated by this improvement. Mutton breeds were also appearing in the West in favorable localities (112).

Some French Merinos were introduced in the forties in response to the desire to combine wool with mutton, as they were a considerably larger breed than the American Merino. They were weak in constitution, however, and did not fit in with the prevailing system of sheep management in this country (113). Grave frauds were also perpetrated on the farmers at this time, as had been the case with the Saxons. Big, ungainly mongrels were sold as pure Rambouillets, and found eager buyers, as the large size of this breed seemed to hold rich promise for the eastern flockmaster. These animals required so much care and were such heavy feeders that they soon fell into disrepute.

EARLY LAMBS—WINTER FEEDING FOR MUTTON.

The change to mutton breeds in the East was still more marked after 1850 than before. Aside from the Merino breeders and sheepmen distant from market or transportation systems, most of the eastern farmers who raised sheep probably kept the animals for both wool and mutton (139). By 1853 the New York and New England markets are said to have relied largely on mutton types for their supplies (140). A considerable activity had developed in the production of early lambs, common and grade Merino ewes being bought in the early fall from drovers, who brought them in from western Pennsylvania, New York, and Ohio. They were bred in September for lambs in February and March. The lambs were sold when about 12 to 15 weeks old at a weight of 40–48 pounds and the ewes disposed of after being clipped or in the fall (141). Rams of one of the mutton breeds or good grade animals were used, and Southdowns were often preferred. The Southdown cross on such ewes for early lambs was an old practice in the East, and the lambs were of a high quality (142). English breeds for early lambs were kept almost exclusively in parts of Massachusetts by 1850, and mutton breeds greatly preponderated in that State (143). The price of mutton between 1850 and 1860 appears to have increased practically 100 per cent over the level of the previous decade (144).

Considerable fattening of mutton sheep (wethers) was done during the winter in the East, the animals often being fed from October or November to February or March, in some instances gaining as much as half a pound per day during the period on full feed, and sold at a considerable advance in price (145). One New York farmer declared that he had been engaged in this enterprise for 30 years, when interviewed in 1863, and that he had lost money but once (146). Mutton breeds seem to have predominated in Kentucky,

where longwools had been the rule on the rich grazing lands. The best sheep for winter feeding in the East were driven in from Kentucky and eastern Canada where the mutton breeds were kept almost exclusively. They were also appearing north of the Ohio, particularly near the cities, and had been introduced into Missouri by 1854 (147). One reason for the widespread change to this type which occurred was the relative enhancement of the price of the strong, coarse wool from such animals. Both medium and coarse wools had been gaining in price on the fine wools, but coarse fiber was gaining the faster (114, 114A).

COMPETITION OF OTHER FARM ENTERPRISES WITH SHEEP.

DEVELOPMENT OF THE FOREIGN MARKET FOR FARM PRODUCTS—IMPROVEMENT IN TRANSPORTATION FACILITIES.

The dominant reason for the absence of any appreciable increase in the number of sheep in this country between 1850 and 1860, particularly for such absence in the Middle West, where the greatest numerical gains had previously occurred, was competition of other farm enterprises with the sheep industry. This competition was due principally to a pronounced betterment of the foreign market for foodstuffs. Harvest failures in England and Ireland in 1845 and 1846 resulted in a marked decrease in the duties on foodstuffs imported into the British Islands from 1846 to 1849, while from 1849 on the duties were fixed at a nominal figure. A steady foreign market was opened to the agricultural products of this country. This market was considerably improved[10] by the Crimean War (1853–56), which closed the Baltic to Russian grain (124).

The effect of the open British market on producers in the Middle West was noticeable immediately. In Chicago No. 2 spring wheat had averaged 47.6 cents per bushel from 1840 to 1846 inclusive, 57.7 cents during the next six years and 93.2 cents during the following seven years. During these same periods No. 2 winter wheat averaged 62.2 cents, 73.8 cents, and $1.161 per bushel in Chicago. Flour averaged $3.21, $3.52, and $4.68 per barrel in New York City; good to choice beef, live weight, averaged $3.17, $4.62, and $5.05 per hundred pounds in Cincinnati, and fair to good packing hogs averaged $2.78, $3.67, and $5.09 on the same market (125). The average price of butter on the Boston market was 16.5 cents per pound until 1847 and 21.3 cents from 1847 to 1859, inclusive, while the price of cheese rose from 6.63 cents between 1847 to 1852 to 8.62 cents from 1853–1859.

[10] The effect of the gold discoveries in California in 1848, and the subsequent discoveries in Australia, was to enhance prices in general. No particular product appears to have been affected more than another.

The general average price of butter first rose 8 per cent and then 13 per cent, while cheese first fell 9.5 per cent and then rose 23.5 per cent.

The price of agricultural products other than wool averaged 32 per cent higher from 1847 to 1859 than during the preceding seven years. Fine, medium, and coarse washed wool on the Boston market averaged 23.7 per cent higher—23 per cent for the first two grades and 25 per cent for the third grade (125A).

During the period of low prices from 1840 to 1845, in spite of the high import duties in England, there was a considerable increase in agricultural exports, though a part of this gain merely counteracted the decline which had occurred during the series of poor harvests and high prices just preceding. With the virtual repeal of the Corn Laws of England in 1846 our export trade increased enormously, and there was nearly a three-fold gain during the decade from 1846 to 1855. A further gain occurred during the next four years. The average annual export of salt pork, hams and bacon, lard and tallow, salt beef, butter and cheese, corn and meal, wheat and flour, was approximately 127,780 tons during the unfavorable period from 1836 to 1840. The average annual export for the next five years (1841–1845) was 225,625 tons of the products specified above, or a gain of 76 per cent. The average for the following 10 years (1846–1855) was 634,150 tons, a gain of 182 per cent. For the four years 1856–1859 the average was 859,430 tons, a further increase of 36 per cent. At this time the shipments of meats and fats, butter and cheese, were stationary, and those of corn and meal decreased somewhat, but exports of flour and wheat increased sufficiently to give the additional gain mentioned (127A). The following tabulation presents the above data in detail:

Average annual exports of specified agricultural products.

Product.	1836–1840	1841–1845	Per cent of gain.	1846–1855	Per cent of gain.	1856–1859	Per cent of gain.
Pork [1] ..... bbls., 200 lbs..	37,214	143,374	285	212,316	49	198,509	− 6
Bacon and hams ..... lbs..	1,329,645	2,868,352	108	27,786,109	870	9,638,925	+ 7
Lard ..... lbs..	7,046,842	20,208,323	187	35,032,786	73	4,803,452	− 1
Beef [1] ..... bbls., 200 lbs..	27,533	70,188	155	107,506	54	126,676	+ 18
Tallow ..... lbs..	273,516	7,089,114	490	8,288,986	17	7,135,911	− 14
Butter ..... lbs..	548,138	3,217,763	485	3,265,020	2	3,433,066	+ 5
Cheese ..... lbs..	560,893	4,585,911	715	10,030,688	109	7,597,988	− 24
Corn ..... bush..	236,995	694,822	193	6,772,735	875	6,070,935	− 10
Corn meal ..... bbls..	168,786	226,550	34	361,516	60	264,408	− 27
Wheat ..... bush..	368,568	589,372	60	2,663,160	352	8,663,355	+226
Flour ..... bbls..	818,586	1,254,939	53	2,543,435	103	3,291,668	+ 29

[1] Salted or pickled.

In any case, the rise in prices and the opening of the British market following 1846 would have resulted in a pronounced increase in agricultural development and exports by widening the zones feeding the lines of transportation existing during the forties, but no such

gain in exports as occurred during the later forties and the fifties could have taken place without a marked betterment of the country's transportation facilities. A betterment was especially necessary in the Middle West. During the late forties and all through the fifties a rapid increase in the railway mileage took place north of the Ohio River. There were about 1,300 miles of track in 1850, and in 1860 almost 10,400 in Ohio, Indiana, Illinois, Michigan, and Wisconsin. With the same length of haul to the shipping point, eight times the area was served by the railroads in 1860 as in 1850, and over fifty times as much as in 1840 (124A), when there were less than 200 miles of railroad in those States.

LOWERING OF SHIPPING COSTS—OTHER PRODUCTS GAIN AT EXPENSE OF WOOL.

The betterment in transportation facilities was also attended by a marked cheapening of shipping costs. Following the enlargement of the Welland Canal and keen competition between the St. Lawrence route and the Erie Canal, a pronounced drop in the transportation charges over the New York route took place. Wheat was shipped by water from Chicago to New York City in 1857–1859 for 19.72 cents per bushel, less than it had cost from Buffalo to New York in 1840–1845 (20 cents), and at least a third less than the former Chicago-New York all-water rate (30 cents or more). It was shipped by all-rail from Chicago to New York for 36.71 cents per bushel, less than it had cost to send it by water from central Ohio in the early forties (approximately 50 cents). The all-water rate from Chicago in 1862–1864 was but a little over half as high as during the years 1840–1845 (17 cents as against about 30 cents). Cattle were shipped from central Illinois to New York in 1860 for $155 per car ($10.33 per head), and the total cost, aside from commission, of marketing 1,400-pound steers in New York from central Indiana in 1861 was $14 per head, or 1 cent per pound. In the early forties it had cost 2 to 3 cents per pound to market Middle West live stock in New Orleans via the Mississippi River (124B).

Not only did transportation costs decline greatly, but the cost of shipping grain was lowered relatively more than that of wool. In 1840–1846 wheat averaged $1.04 per bushel in New York, and the cost of transporting one dollar's worth from Chicago was approximately 30 cents. In 1862 the price averaged $1.29 per bushel and the cost of shipping one dollar's worth was 18 cents, a reduction of 12 cents. On the other hand, medium wool averaged 36.4 cents per pound in Boston in 1840 to 1846, and the cost of sending one dollar's worth from central Illinois was 5.82 cents or more (2⅛ to 2½ cents per pound). In 1862 the currency price averaged 50 cents per pound in Boston, while the cost of delivering one dollar's worth was 3.34

cents. Thus the reduction on the wheat rate was nearly five times as much as on the wool. Indeed, it would have been much larger save for a temporary rise in the rate on wheat from Chicago in 1862. In 1857 medium wool averaged 42.33 cents per pound in Boston, and at the same rate as in 1862 the cost of shipping one dollar's worth was 3.95 cents. Wheat in those years averaged $1.29 in New York and the cost of transporting one dollar's worth from Chicago was 14 cents (19.76 cents per bushel), a reduction of 16 cents over the cost from 1840–1846, and nearly nine times that on wool (124C).

SUBSTITUTION OF OTHER FARM ENTERPRISES FOR SHEEP—RISE OF DAIRYING IN THE EAST.

From the above data it seems clear that there was small reason to look for much of an increase in the sheep industry in the fifties. The pronounced gain in railroad mileage, the cheapening of transportation charges, the greater relative reduction in the cost of shipping other products, and the greater rise in price of other products than of wool militated strongly against an extension of the industry in the Middle West, while the cheapness of wool production in the West placed the eastern sheepman under a severe handicap. At the same time, other enterprises were more attractive in the East. Accordingly, while the sheep industry in the West advanced, though but slowly, in the East the number of enumerated animals declined from 7,900,000 to 6,500,000, or nearly 22 per cent. In 1860 the North Atlantic States contained slightly over one-fourth of the national total as against one-third in 1850 and nearly 60 per cent in 1840.

The farmers of the Middle West, therefore, gave greater attention to grain, beef, and hog production, and, in the older settled sections, to dairying, than to sheep and wool, after the late forties. Enormous areas of land formerly practically valueless for grain production obtained shipping facilities during the fifties. Men with sufficient capital to break the prairie sod and put in grain were able to make good profits where before, because of the lack of a market, they had barely made a living. Funds for investment in live-stock enterprises and the necessary improvements to adopt them often were difficult to secure, and the interest rates were high. With wheat selling in Chicago from 1853 to 1859 for twice as much as between 1840 to 1846, the effect on agricultural production may easily be surmised. The rise in price of corn and oats encouraged their production by men unable to secure capital for live-stock enterprises to consume their own crops, while men able to invest in live stock generally adopted cattle and hogs. In 1850 many men in the Middle West figured that there was more profit in selling corn at 25 cents per bushel than in feeding it to live stock (126A). A marked increase in dairying took place in the Western Reserve of Ohio during the

late forties (133). In southern Ohio beef cattle displaced sheep to a large extent (136).

The eastern farmer gave more attention than ever to dairying, grew hay, grew more grain (probably largely for feed), and sometimes fed beef cattle in competition with the West, though uncertain prices attendant on western competition rendered this enterprise somewhat risky (152). As early as 1842 many New York farmers were plowing up sheep pastures for grain because of the low price of wool (129).

The census returns show an increase in wheat production of 13 per cent, oats 10 per cent, corn 50 per cent, and hay 21 per cent, between 1840 and 1850 for New England and the Middle Atlantic States. Settlement in western Pennsylvania would account for but little of this increase. There was only a small increase in the total number of cattle, but probably a marked gain in the number of dairy cows in this section at that time. This is indicated by the gain in hay and corn production, as well as by copious references in the agricultural press to the increase in dairying in the East. Between 1850 and 1860 the number of dairy cows in this section increased nearly 20 per cent (130). Even in Vermont, the old stronghold of the eastern wool grower, in 1848 dairying was gaining as rapidly as sheep were declining, and the same was true of parts of New York (131).

The receipts per sheep (excluding manure) averaged about $1.72 per head in large flocks kept for wool in 1850 (127D), the farmer being reckoned to receive the average Boston price of wool from 1832 to 1845 (practically 40 cents per pound). About eight wool sheep were considered equivalent to a cow in feed requirements, making the receipts per animal unit[11] about $14. The receipts per cow in butter and cheese dairies ranged from $20 to nearly $70, usually from $30 or $35 to $60, or two to four times as much as was secured from an equivalent number of sheep (127E). As early as 1838 the profits per cow in Massachusetts were reckoned at $12 to $18, or from 33 per cent to 100 per cent higher than Randall's extravagant estimate as to the profits in wool growing in New York (127F). One dairyman averaged 130 pounds of butter per cow in a dairy of 50 animals in 1857. In 1863 his herd had increased to 80 head and the butter per cow averaged 225 pounds. At the same time, a pound of butter was made from 20 pounds of milk as against 39 pounds in 1857, while the yield of pork made per cow[12] increased from 92.5 to 144 pounds. The receipts per cow had risen from $37.50 to $67.50 (127H).

The wholesale price of cheese in Boston rarely varied more than 25 per cent between grades or from year to year after 1840; usually

[11] An animal unit is a cow or a horse or as many smaller or younger stock as require as much feed.

[12] Due to feeding hogs with dairy by-products.

the variation was less, and sometimes it was as low as 14 per cent. The changes in butter prices usually were smaller than in the case of cheese. On the other hand, the annual fluctuations in the Boston price of wool from year to year within grades sometimes were as much as 50 per cent, while variations of 25 per cent or more were a common occurrence. Price fluctuations between grades, of course, were far more pronounced (127K). With wool production in the East barely paying the cost of production, and the market very uncertain, as contrasted with the steady, strong, and rapidly growing market for dairy products, there was every incentive for the eastern wool grower to change to dairying. Many of them adopted mutton types of sheep for the growing urban meat market, but the marked decline in number of sheep and the growth of the dairy industry after 1840 indicate the real status of the enterprises. Dairying was almost universally regarded as more profitable and more permanent by the eastern farmer in 1850 (127C). This enterprise also enabled the farmer to utilize the cheap labor of the family to a degree not remotely possible in wool production. The growing city demand for market milk was an added incentive to the substitution of cows for sheep (127B), and improvements in the transportation facilities in the East played no small part in the change which occurred (127).

CONTINUED GROWTH OF WOOLEN MANUFACTURES (1843–1860).

In spite of the fact that the sheep industry virtually was at a standstill by 1850, the woolen manufactures had continued to advance, although there came a change in the character of output during the forties (115). For the years 1843–1850, inclusive, the average net annual imports of raw wool averaged 14,200,000 pounds, an increase of more than 50 per cent over the average for the period 1832–1842. The average value per pound lowered slightly (138). The price of all wools averaged lower during this decade, but a pronounced advance in at least the coarser manufactures is clearly evident. The domestic grower evidently continued to supply the bulk of the demand for grades competing with his clip until about 1850 (116). From 1851–1860, when the sheep industry was stationary, the net annual imports of raw wool were 22,900,000 pounds, and the average price per pound 14 cents, or more than 70 per cent increase in volume and more than 100 per cent increase in price as compared with the previous period (1843–1849) (138). Owing to the growth of his business and the lack of growth in the sheep industry in this country the American woolen manufacturer had to draw more largely on foreign wools similar to the domestic clip than had been the case for 20 years prior to 1850.

THE WOOL CLIP OF 1850 AND 1860—BREEDING FROM FINER TOWARD MEDIUM WOOLS.

The 1850 wool clip was returned as 52,500,000 pounds, or nearly 2½ pounds per head, as against 36,000,000 pounds, or a trifle less than 2 pounds per head in 1840. Subsequent revision by census authorities has lead to the conclusion that the 1850 clip was 11,500,000 pounds too low, and that the true average was 2.7 pounds per head. The average reported for 1840 also is undoubtedly somewhat low. The clip was probably about 40,000,000 pounds, and the average per head slightly over 2 pounds. The wool clip of 1860 was reported as 60,250,000 pounds, or 2.6 pounds per head. Subsequent revision has led to the conclusion that the real clip was 20 per cent larger than the enumerators returned, giving an average per head of practically 3 pounds (123). The gain in the yield of fleece per sheep from 1840 to 1860, therefore, was 50 per cent, from 2 pounds to 3.

Men growing wool after 1840 had worked steadily for a heavier fleece (148). Soon after 1840 the movement on the part of Merino woolgrowers was distinctly away from the finest wools. The larger, coarser-wooled, heavier-fleeced Merinos were by far the most popular. This, of course, was only to be expected in view of the steady advance in the price of medium and coarse wool as compared to fine, which had been taking place since the early forties, due to a change in the manufacturing demand (114, 114A). So far as possible, most men starting new flocks in the West, as well as sheepmen in the East, secured such Merinos in preference to animals giving a finer fleece.

This course of breeding necessitated the decline of the Saxon breed which has been noted, as has the westward migration of Merino animals. The Saxons also showed a strong tendency to move to the west of the Alleghenies. Although they were pretty generally discarded for the Merino before 1860, they were still popular in southeastern Ohio, western Pennsylvania, and the northern part of western Virginia. For a long period following 1850 this section produced the finest of the domestic clip (149).

BREEDING FOR YOLK.

During the two decades preceding 1860 the Merino breeders made striking gains in the clip from pure-bred animals for breeding purposes. In this period they also strove for an increased secretion of yolk in the fleece. The manufacturers made little difference in the price paid for excessively yolky fleeces and, in general, made the same reduction for unwashed wool whether or not relatively free from that secretion. The woolgrower governed himself accordingly, and the breeder did his full share (150).

INTRODUCTION OF THE SILESIAN MERINO.

In the fifties a few Silesian Merinos were imported from Germany by persons still endeavoring to grow the finest wool. This strain was practically as fine-wooled as the Saxon, but had been bred for sturdy constitution as well as fine fleece for nearly half a century. Accordingly, it had attained all the good points of the Saxon with none of the poor ones. The movement toward heavy fleeces of a medium fiber, relative to the fine clip of the Saxon and Silesian strains, was so strong at this time that but little was done with this breed save by a few men (152).

WOOL DEPOTS.

In connection with the wool trade, wool depots appeared during this period. One was opened at Kinderhook, N. Y., in 1845, one at Buffalo in 1846, one at Springfield, Mass., at about the same time, and another in Chicago in 1851. A number of small ones were opened in Vermont in the late forties, and in Ohio before 1853 (153). It seems that they were not well patronized, though the charges were very moderate, and they remained in operation for only a few years It was sometimes claimed that the managers took advantage of their patrons and operated the depots for their own advantage (154).

SHEEP IN GENERAL A MINOR FARM ENTERPRISE BY 1860.

From the foregoing discussion it is evident that after 1845 the competition of other farm enterprises forced sheep into the background in most sections of the East, as well as in parts of the West. On the whole, wool sheep were relegated once more to a position of minor importance save where geographical or other conditions especially favored wool growing. This is evidenced by the failure of the Middle and Central Western flocks to make more than a trifling growth between 1850 and 1860 in spite of continued agricultural settlement. The stationary character of the sheep industry is indicated also by a pronounced increase in imports of wool, and the rise in the average price per pound of such imports, as well as by an increase of practically 125 per cent in the value of manufactures of wool imported annually from 1848 to 1860 as against the annual average for the four years 1844–1847 (138).

FIFTH PERIOD (1860–1870).

THE CIVIL WAR.

DEMAND FOR WOOL GREATLY INCREASED.

The decade between 1860 and 1870, marked by the Civil War of 1861–1865, saw a great change in the sheep industry, due to war

conditions and the scarcity of cotton. A large increase in the domestic demand for wool occurred, due to military necessities and the need to replace cotton with wool. At this time there was a large increase in manufactures of all woolens, especially from medium and coarse wools, due to the military demand. A marked diversification of the factory output also took place (157). The demand for wools below the fine grades was enhanced very much relatively, but a rapid increase in the domestic and world wool supply prevented any pronounced rise in the price of wool on a gold basis, and the average gold price of coarse wool, more largely in demand for military uses, was only 9 per cent higher from 1861–1865 than in 1860 (155). However, the currency prices of all grades increased enormously after the suspension of specie payments in 1862, and this fired the imagination of woolgrowers. At the same time the rise in price of other farm products, due in large part to the loss of the southern market, was less than that of wool during the earlier part of the decade (156). In 1862 wheat in central Iowa was a drug on the market at 50 cents per bushel, currency, and corn at 15 cents (156A). In central Illinois corn actually sold as low as 10 cents a bushel in 1862.

INCREASE IN NUMBER OF SHEEP.

In response to the increased demand for wool and the price it commanded, the number of sheep increased rapidly. The States east of the Rocky Mountains and north of Arkansas, Tennessee, and Virginia contained practically 36,000,000 in January, 1867, and the entire country east of the mountains was estimated to have a little over 39,000,000 (158). In 1860 these northern States had contained but 16,000,000 sheep (159). In the old sheep centers of the East the number had practically doubled. In New Hampshire sheep even displaced dairying in some favorable localities (161). In Ohio the number doubled, while in the North Central States as a whole the number increased 160 per cent. In the trans-Mississippi States the number increased 170 per cent. By far the bulk of the increase in numbers occurred in the older sheep-growing States in both the East and the West, as the foundation was already present for it. In the newer States a greater relative gain was made, but lack of capital was often a serious deterrent (162). On the other hand, free pasturage was abundant in many of those sections, and often little capital other than that necessary for the purchase of the sheep was needed for a start. The agricultural press was full of warnings, however, against sheepmen expecting to succeed with nothing but range pasture and no shelter, as many men tried to do. Both feed and shelter were necessary in the winter at least (163). At

this time, with the sheep industry booming, the high value of wool compared with its bulk, and the cheapness with which it could be shipped compared with the cost of shipping grain, received much attention. Many men went into wool production on the prairies as a major enterprise, with flocks of 2,000 to 5,000 head (163A).

THE SECOND MERINO MANIA—SPECULATIVE PRICES.

By far the greater part of the increase which occurred was in Merinos and Merino grades (160). The Vermont Merino breeders reaped a rich harvest at this time, as much as $3,500 to $5,000 per head being reported for the sale of fine rams, while $800 or more often was received. It cost $2,000 to $3,000 a season for the service of the most noted Vermont rams. Extra fine ewes commanded from $100 to $300 and more per head (164). It is reported that one Vermont breeder refused $10,000 for his best ram on the ground that he could not risk a deterioration in his flock by letting him go (165). Another breeder in that State refused to sell his flock of 200 head for $50,000 (166). A common price in Vermont appears to have been about $25 for ewes and $100 for rams before the Merino mania reached its height (167).

AMERICAN MERINOS CHAMPIONS AT HAMBURG.

The fame of the Vermont Merino and the demand for them were increased greatly by the showing made by George Campbell's animals (largely of the Hammond strain) at the agricultural exhibition at Hamburg, Germany, in 1863. He exhibited 12 animals, the only American sheep there, against 1,761 European Merinos, 60 of them from the Royal French flock, and took two first prizes and one second, outranking all other Merino exhibits for length of staple and weight of fleece. These sheep were sold later to a Silesian breeder for $5,000 (168). Soon after this year there also began a movement of pure-bred rams from America, principally from Vermont, into the Southern Hemisphere, to which their fame had quickly spread. South America and Australasia were the principal buyers, though South Africa also entered the field a little later. The movement continued for several decades, slackening first in New Zealand, where the mutton types (cross-breds) became prominent earlier than elsewhere in the Antipodes (168 A).

New York Merinos sometimes were shipped to Vermont and then sold as being of the Vermont strain. Breeders in the other sheep States of the East, as well as in the Ohio district, also reaped large profits from sales of breeding stock. Two or three towns in one New York county sold 1,100 animals to western buyers in the summer of 1864 (169). In Illinois in 1866 ordinary Merino rams sold for $25

to $65 per head (164A). Some fine stock was shipped by sea to California (173).

CONTINUED BREEDING FOR YOLK.

At this time the earlier efforts of the sheep breeders for heavy-fleeced animals with an excessive secretion of yolk were accentuated, owing to the high price of wool. For many years prior to 1864, a farmer selling well-washed, clean fleeces secured only 2 or 3 cents more per pound than the man selling excessively dirty, yolky wool, which shrank very much more in cleaning and scouring. Often no difference in price was made (170). A reaction against the excessively yolky animals showed some strength soon after 1860, however (171). Men found that what seemed an inferior animal in the show ring, one which did not compare with the black-coated, heavy-fleeced animal so far as the unwashed clip was concerned, was better for breeding purposes and had not suffered a loss in vigor from the forcing methods used by many breeders. Claims were advanced that the purebred Merinos were becoming short-lived as a result of the forcing methods in use (171A).

THE "CORNWALL FINISH."

The Vermont Merinos were characterized by a dark-brown or black tingle in the exterior of the fleece, due to abundant yolk and dirt of various kinds held by it in the last eighth inch or more of wool. In fraudulent imitation of this, what was called the "Cornwall finish," a product of Yankee ingenuity, was often given to inferior animals. A mixture of burnt umber, lampblack, and linseed oil was applied to the fleece to give it the characteristic color of the highly bred Vermont Merino. This often was so cleverly done that none but a flock-master well acquainted with the breed could detect it. Unsuspecting farmers were easy dupes, particularly in the West. Every animal with the look of a Merino and a greasy fleece had a ready sale (172).

GAIN IN POPULARITY OF THE MUTTON BREEDS.

The Merino, however, was not the only breed to receive marked attention. Retention of sheep for wool operated to better the market for mutton, the gold price of which rose faster and averaged higher than that of beef or pork during the course of the war. Relative to 1860 prices, mutton averaged 62 per cent, beef 22 per cent higher, and pork 9 per cent lower from 1861 to 1864, inclusive (174). For a considerable period prior to 1862, and probably continuously since before 1800,[18] prime mutton had been selling at a higher price than

[18] Prime mutton brought a higher price than beef before 1800 both in this country and in England (174A).

beef in the larger eastern markets, and lamb still higher (175). It was estimated that mutton cost much less to make than pork (176). Lean sheep in the fall following 1860 commonly brought about 3 cents per pound and sold fat in the early spring (February or March) for about 5 cents, often more. The fall market was always glutted with mutton, and the price was correspondingly depressed, as would be expected before the days of refrigeration (177).

The rise in price of mutton during the winter often made it fairly easy to feed at a profit (177A). Accordingly, in the East, as well as in parts of the West, the mutton breeds became increasingly popular, particularly near or within easy reach of the cities and on the higher-priced lands. After a slump in wool prices which occurred in the later part of the decade the increase of mutton blood and of early lamb production in both the East and Middle West was considerably accelerated (178A).

The greater appreciation in the value of coarse wool compared with medium wool, which has been mentioned, also operated in favor of the mutton breeds in many sections (178). The scarcity of cotton and the use of long-combing wools in fabrics where cotton had been combined with wool turned attention to the long-wooled breeds, such as Lincoln, Leicester, and Cotswold (179). In 1860 most of the long wool manufactured in this country was imported, largely from Canada (180). The agricultural press and the reports of the Commissioner of Agriculture gave much space to this phase of the wool production, as well as to mutton breeds in general.

PRICES PAID FOR SOUTHDOWNS.

Fine Southdown animals commanded good prices, though far below those secured by the Merino breeders for choice animals. One New York breeder of Southdowns offered pure-bred animals for $22 to $150 per head, depending on age and quality. Another sold ewes for from $13 to $95, and rams for $17 to $500. The last figure was paid for an animal imported from Webb's flock in England at a cost of $1,250. In one sale the average for all the animals sold was $45 per head. At a sale by another breeder ewes and ewe lambs brought as much as $50 per head, and rams and ram lambs as much as $160. At a sale of Shropshires the price of ewes reached $28 and of rams $125 each (181). Many shipments of Southdowns were sent to California during the sixties. Mutton breeds also began to receive attention west of the Alleghenies and were preferred by some farmers as far west as Minnesota (182). However, the speculative prices commanded by the best Merinos seem to a considerable extent to have retarded the change to mutton blood (128A).

IMPROVEMENT IN THE WOOL CLIP (1860–1870).

During this decade the wool clip increased to a marked degree. The average in 1860 was probably 3 pounds. The number of sheep returned by the census in 1870 was 28,500,000 and the wool clip a little over 100,000,000 pounds, or nearly 4 pounds per fleece. The estimate of the Department of Agriculture for weight of fleece in February, 1870, was practically the same. This gain in weight of the fleece was a logical result of the diligence with which woolgrowers worked for it throughout the decade and of a rigid reduction of the flocks in the late sixties when the weaker and less profitable animals were weeded out. As a result of the increase in number of sheep the domestic wool clip available for manufactures considerably more than doubled during the war (183). But the woolen manufactures grew so rapidly that imports of raw wool, particularly the cheap wools, also doubled. At the same time the average imports of woolens from 1861 to 1865, inclusive, decreased practically one-fifth from the average for 1854 to 1860, inclusive (184).

READJUSTMENT IN THE SHEEP INDUSTRY (1867–1870).

A sharp decline in the price of wool followed the close of the war. The world demand for wool naturally had been increased greatly when the cotton of the South could not reach the market. The price of cotton advanced so much that woolen goods largely replaced cotton manufactures, though cotton production elsewhere was stimulated to a considerable degree. An enormous increase in the growing of wool in the Southern Hemisphere, particularly in Argentina, South Africa, India, and Australia, prevented any marked rise in wool prices, which were fairly steady. The world supply increased more than a third between 1860 and 1870, a large part of the gain occurring in the first half of the decade, when the cotton famine was present. When this famine was removed at the end of the war wool prices slumped, owing to the general oversupply (187).

In 1866, when it was expected that the tariff on both wool and woolens would be raised very much, an enormous quantity of woolen goods was imported to avoid this anticipated advance (185). The net amount of raw wool imported also was largely increased over the imports for the preceding year. The tariff of 1867 was then adopted, but the woolgrower and the manufacturer were hit very hard by these heavy imports and by the sale of large stocks of Army woolens for several years (186). With wool prices falling rapidly, and the largely increased flocks, enlarged on the basis of abnormal conditions, no longer a profitable source of income in most parts of

the country, the woolgrower discovered that a readjustment was necessary in his business.

A general rise in the price of other farm products after the close of the war, due in large measure to the restoration of the southern market, was another factor complicating the situation for the woolgrower. The price of mutton fell slightly, in marked contrast to the rise in price of beef and pork. Wheat averaged 44 per cent higher during the six years following 1864 than for the four ending in that year. Beef averaged 32 per cent and pork 72 per cent higher, while mutton averaged 14 per cent cheaper (191). The currency price of fine, medium, and coarse washed Ohio fleece wool for the clips of 1867–1870, inclusive, averaged 38 per cent cheaper than for the clips of 1862–1866, inclusive (192).

The American woolgrower, therefore, had to shape his enterprise to the new conditions, and a wholesale reduction in the number of sheep followed (188). This was especially the case in the East and in the North Central States. In the States east of the Rocky Mountains which had not seceded, the reduction was more than a third of the total number—from nearly 36,000,000 to 22,500,000 animals between January 1, 1867, and January 1, 1871 (189). It was even estimated that the decline in 1868 was one-fourth of the total number in the country (190). Large numbers of sheep were driven westward and probably to the Far West in the hope that more would be realized for them than could be secured by slaughter for the pelts and tallow (193). The demand for good breeders remained active in that section, as the western ranges were just laying the foundations of the industry that gave them their dominant position of later years. Parts of Missouri appear to have drawn on States eastward as far as Vermont for good stock at this time (194).

In the North Atlantic States the number of sheep was reduced almost two-thirds. In New Hampshire sheep were sold by thousands for from 30 cents to $1.50 per head and shipped to Boston for slaughter (195). A heavy decrease in numbers was due to poor care and feed following 1867, many thousands dying every winter from exposure and disease in both the East and the West (196). The decline in the North Central States and in the Central West was practically one-third. Wool growing could not permanently compete with other enterprises on the prairies (197). In central Ohio several slaughtering establishments were erected for killing 20,000 to 50,000 sheep each for pelts and tallow. The refuse from the vats was fed to hogs. Sixty cents to $1.25 per head was paid for the stock. Good animals were sold by thousands for $1 to $2 which a year earlier had been held at $20 to $40 (198). In Iowa farmers are said to have offered their sheep for sale at $1 each, or 3½ bushels of

ear corn (199). It is interesting to note that at this time, and for the same reasons, sheep were extensively slaughtered in Australia and South America (199A). On the other hand, however, many farmers bought good stock for a song during the panic of reduction and disposed of all their poorest animals. They did not believe the depression would be permanent (200).

THE SHEEP INDUSTRY IN 1870.

By 1870 the sheep industry was back to normal, the culls had been weeded out (199B), and the enterprise was restored to its former place as a minor activity on most farms outside of the Ohio district and the most favorable sections in the East.

The net gain over 1860 in the States east of the Rocky Mountains which had not seceded was nearly 50 per cent—from 16,000,000 to 22,500,000, according to estimates of the Department of Agriculture for February, 1871 (201). The department figures for February, 1871, so far as the total number in the country is concerned, appear to be more accurate than the census returns for 1870. The census placed the total number at 28,478,951, while the department estimate was 31,581,000. The North Central States showed a net gain of 71 per cent over the census figures for 1860, the Central West a gain of 172 per cent, and the Far West a little over 100 per cent. Aside from the North Central States, this increase in numbers was largely a result of natural growth and settlement. The principal gain in the far West was in California, New Mexico, and Oregon, in the order named. In the other parts of that region any increase was largely due to the demand for mutton in the mining districts (202). The greater number of sheep in the North Central States, in spite of a tendency toward a decrease in that section before 1860 in other than the newer districts of the region, was undoubtedly due in considerable measure to the high tariff on wool. Many growers felt that with the degree of protection offered they could still grow wool with profit on their land, which as yet was cheaper than much of that in the East. The average gain of a pound per head in the wool clip undoubtedly strengthened them in their belief. At the same time, much of this section was new, and at the prices which had prevailed for several years men were able to purchase sheep for their cheap lands who ordinarily could not afford to secure the breeding animals. In the Ohio district—southeastern Ohio, southwestern Pennsylvania, the Panhandle of West Virginia, and southern Michigan—the geographical features were quite favorable for the continuation of wool gathering. In New England, the Middle Atlantic States, and the South the number of sheep in 1871 had declined 24 per cent from the 1860 figures.

SIXTH PERIOD (1870 TO DATE).

CONTINUATION OF THE WESTWARD SHIFT.

BASIS OF THE FLOCKS IN THE FAR WEST.

Following 1870 the outstanding characteristic of the sheep industry was its further shift westward to areas of cheap land. Sheep have always been a frontier enterprise, to a great extent, when wool is the main product, and the industry moves with the frontier. It seems evident that the preceding decade, by the pressure of abnormal factors, had simply arrested this westward movement for a time. After 1870 rising land values and competition with other farm enterprises steadily thinned out the sheep in the East and a large part of the Mississippi Valley.

The shift first showed most prominently in Texas,[14] New Mexico, and California. The foundation stock was the degenerate Mexican breed, yielding from 1 to 1½ pounds of coarse wool (203). These animals were descended from sheep brought into North America by the Spaniards much earlier than they arrived in the English colonies. Sheep and the domestic manufacture of wool were firmly fixed in Mexico fairly early in the sixteenth century. Mendez took some to Florida in 1565 (204). The Chourros ("Choaroes") or Spanish longwooled sheep, and also probably some of what later were called the Merino, or fine-wooled breed, were sent to the New World, where they interbred and rapidly degenerated into the mongrel coarse Mexican breed which furnished foundation stock for the Southwestern and Pacific territories centuries later (205). The sheepmen of this section bred up these mongrels with the Merino, sent in from the older woolgrowing sections.

CHARACTER OF THE WESTERN SHEEP INDUSTRY.

The sheep industry in the far West began and, in most parts of the section, continued on a different basis from that in the East. Sheep were adopted as a major enterprise, or as the sole enterprise, usually the latter, outside of Utah, where the industry also soon took on this character (225). They continued to occupy this dominant position throughout the greater part of the region, though in more recent years a change occurred in some sections in response to agricultural settlement and development of other enterprises in competition with sheep. At first the animals were kept practically exclusively for wool, and the Merino, being better adapted to the range conditions, was the breed adopted.

[14] In the following discussion Texas will be classed with the States of the far West, as the character of her sheep industry was distinctly of the western type.

SHEEP MOVEMENTS AND BREEDING IN THE FAR WEST.

In the case of New Mexico, where the sheep industry dates from about the year 1700, the Mexican sheep were driven to California in large numbers in the fifties, bred up with the Merino, and then sent back in the seventies for the improvement of the New Mexican flocks (206). New Mexico was extensively drawn on for many years for foundation stock in the far West, the animals being steadily improved with Merino blood (207). Considerable French and some Australian, as well as American Merino blood was used in California, besides a strong infusion of mutton blood on the Mexican sheep of that State, but the earlier improvements were made largely with the American Merino (208). In 1880, 75 per cent of the California animals were high-grade Merinos (209). It is believed that in the early seventies virtually all the sheep in the State were half-blood Merinos or better (210).

Sheep first appeared in Oregon in 1829, when some were imported via water from California by the Hudson Bay Co. station at Fort Vancouver, on the Columbia River. The sea captain intrusted with the project was a better sailor than stockman, however, and when the animals were turned out to breed at the fort they were found to be wethers exclusively. There were 200 head at the fort in 1835. Later additions to the flock, with the increase, brought the number to 2,500 in 1841, and some fine-wool blood from Australia was present (210A).

Sheep were first driven in considerable numbers to Oregon from California in 1843, the drives continuing for some years thereafter, but a reverse process set in by 1850, when numbers of Oregon sheep were driven back for mutton sale to the California miners (211). Pure Vermont Merinos and other pure-breds reached Oregon before 1860, but the industry in that State grew but slowly until after 1870 (212). The Merino was the predominant breed for many years, though by 1890 the farmers in western Oregon were turning their attention to the mutton breeds to a large extent. In eastern Oregon the Merino typical of that period held first place much longer, owing to the character of the range (213).

By 1870 some sheep had reached southeastern Washington from Oregon, and also northern Idaho and western Montana, largely from Oregon and California. These were predominantly Merinos, although pronounced admixtures of mutton blood were present in the Montana sheep. This blood was largely bred out in a short time, and 95 per cent of the wool clip in 1886 was fine or fine medium. This was but logical when the character of the range and of the market at that time is taken into account (214). Sheep also appeared in Arizona, following the settlement of the Indian troubles of the seventies, being driven in from Utah, Colorado, California, and New Mexico (215).

Until nearly 1870 there were but few sheep in Colorado. They were in the southern part, of the Mexican breed, and largely owned by Mexicans. Later increases in this State were improved to a considerable degree by improved Merino grades driven eastward from California and westward from the East (223). There were few in Utah in 1870, but these were good animals, with a large proportion of mutton blood, later greatly modified by flocks from New Mexico, which, again, were vastly improved by grading up with the Merino (224).

In 1880 sheep were present in considerable numbers in all the Rocky Mountain States, although the great bulk of the animals in the far West were in the Coast States, New Mexico and Texas.

In Texas the greater part of the sheep are said to have been of the unimproved Mexican type until well on in the seventies (217). Improvements made by early importations from the North evidently had been local in character, and probably were largely nullified during the war period, although quickly resumed thereafter (218). It had cost about 10 cents per head for ferriage, bridge tolls, etc., during the drives into Texas from the North in the sixties. The sheep were wintered in southern Missouri by the conservative drovers, in order not to weaken them by too steady driving, thus saving heavy losses, and making acclimatization easier at the end of the drive. Animals bought in the North for $4 per head sold in Texas for $8 and $10, while the wool shorn in Missouri in the spring paid for the winter keep and the labor of the drive (219). Enthusiasts on the subject of sheep farming in the Lone Star State claimed that the only expense to which a flockmaster was put was the cost of the herding, etc., no feed or shelter being required (220). In 1860 Mexican ewes were bought in Texas for $1.50 each, while grade Merinos were bought in 1867 for $2 to $3 (221). By 1890 the flocks had been vastly improved, and the wool clip is said to have contained relatively little of the coarse Mexican fiber (222).

In 1870 more than 80 per cent of all the sheep in the country were Merinos or Merino grades. The percentage of this breed in the far West was certainly much higher, not counting the degenerate Mexican animals in the Southwest. It was estimated that in New Mexico 72 per cent of the sheep were still of the unimproved Mexican breed (225A). In 1880 it was estimated that more than nine-tenths of the sheep in the far West approximated more or less closely to the Merino standard (226).

PROGRESSIVE ADVANCE IN NUMBER OF SHEEP IN THE FAR WEST.

Since 1880 the growth of the sheep industry in the far West has nearly offset a pronounced decline which has occurred in other sec-

tions. This growth with reference to the United States total (adult sheep to the nearest thousand) is as follows:

Year.	United States.	Far West (230).
1870....	28,478,000	4,666,000
1880....	42,192,000	18,233,000
1890....	40,876,000	19,203,000
1900....	39,853,000	23,669,000
1910 [1]...	39,644,000	24,666,000

[1] See footnote, appendix, Sheep in the United States, for discussion of 1910 census figures.

The national and the far West figures for 1870 are both low, owing to failure to include range flocks in the Central and far West (probably several million head in all) in the census returns for that year. The remarkable increase west of the Rockies by 1880, therefore, seems much greater than really occurred, though very striking, however considered. This gain represents almost the entire increase in the national sheep population during the seventies. The pronounced thinning out of the flocks east of the Missouri during the late sixties, accompanied by similar sacrifices in South America and Australia, had been carried too far. With normal conditions restored in the wool market in the early seventies the undue depletion in the supply was noted immediately. The high tariff of 1867 induced many sheepmen in the older sections to maintain their flocks at about their existing size, while the possibilities of the open range in the far West held out an alluring prospect to the more adventurous flockmaster. The completion of the first transcontinental railroad in 1869 and subsequent extension of railway mileage in the far West enabled the western woolgrower to utilize his opportunity. It is estimated that in 1866 the far West contributed only 15 per cent of the domestic wool clip (137,000,000 pounds). In 1873, 25 per cent of the wool clip came thence, and in 1885 about 45 per cent (228).

In 1880 more than two-fifths, and in 1890 nearly one-half of the country's sheep were in the far West. The slow increase in that region between 1880 and 1890 (1,000,000 head, or 5.5 per cent), as contrasted with the striking gain during the preceding decade, was in part due to lower wool prices during the later eighties. The world's wool production increased nearly 50 per cent between 1870 and 1884, the demand for wool was fully met (229), and for some years there was less pressure for further expansion in the far West.

It is also very probable that wool growing had been started in parts of the western country where conditions were more favorable for other enterprises, and that there was a readjustment of the sheep industry to localities where natural conditions most favored it. Very likely the range in many sections had been overstocked, as in eastern

Colorado (28 A), and financial stringency following the panic of 1879 undoubtedly had some effect in slowing up the growth of the industry.

RISE OF THE SHEEP INDUSTRY IN THE MOUNTAIN REGION.

The continuation of the increase in sheep in the far West after 1890 was almost entirely the result of a concentration of the sheep industry in the Rocky Mountain region. This movement continued to progress during the next decade and marked the end of the westward shift in wool production. The Rocky Mountain region—Montana, Wyoming, Idaho, Utah, Colorado, Arizona, New Mexico, and Nevada—is the logical home of the wool grower in this country, owing to the predominance of grazing land of low value unsuited for other range animals. The foraging qualities of sheep, the high value of wool compared with its bulk, and the ease with which it can be transported, are complementary to natural conditions on the western range. Accordingly, tariff revisions and variations in the price of wool have had far less effect on the range flocks than on those elsewhere in the United States. The remarkable growth of the flocks in the mountain region is one of the most striking incidents in the history of the American sheep industry. This growth is depicted in the following tabulation (adult sheep figures to the nearest thousand):

Year.	United States.	Coast and Texas.	Mountain region.	Entire far West (230A).
1870....	28,478,000	3,845,000	821,000	4,666,000
1880....	42,192,000	11,136,000	7,097,000	18,233,000
1890....	40,876,000	9,683,000	9,520,000	19,203,000
1900....	39,853,000	5,684,000	17,984,000	23,666,000
1910....	39,644,000	5,157,000	19,510,000	24,667,000

Sheep in the mountain section have increased much faster than elsewhere in the far West. During the seventies the reported gain was 900 per cent for the mountain section as against 290 per cent for the entire far West. The same factors which retarded the far West as a whole during the following decade were operative in the mountain division, but with less effect. The California flocks declined 2,330,000 head, owing principally to agricultural settlement, but increases in Texas, Oregon, and Washington partly counteracted this loss for the Coast-Texas division. The New Mexican flocks were heavily drawn on for stock sheep by flockmasters elsewhere in the West and declined nearly 1,500,000 head, but this loss for the mountain section was more than compensated by the gain in other parts of that division. A 34 per cent increase in the mountain section gave the entire far West a net gain of 5.5 per cent in spite of the Coast-Texas decline of 13 per cent during the eighties. In 1880 the moun-

tain district contained one-sixth and in 1890 nearly one-fourth of the national sheep total. The concentration of the sheep industry in this section during the period of low wool prices of the nineties was especially rapid. The Coast-Texas division, in spite of increases in Washington and Oregon, suffered a decline of 41 per cent (practically 4,000,000 head). This was principally due to agricultural settlement in Texas and California and to some extent to abandonment of wool sheep by operators who had continued that enterprise on land better suited to other uses. The 23 per cent gain for the far West, as a whole, was principally due to the 90 per cent increase in the flocks of the mountain section (from 9,500,000 to nearly 18,000,000 head). During the following decade the Coast-Texas division suffered a further decline of 9.3 per cent, while the mountain division of the far West experienced a gain of 8.5 per cent. The westward shift in the sheep industry had almost ended by 1900, when the range in most localities had become fully stocked with sheep. Changes during the following decade were virtually only readjustments on the range and in cultivated areas of the far West in completion of the shift.

PROGRESSIVE DECLINE IN THE EAST, MIDDLE WEST, AND SOUTH.

The increase in sheep on the range has been more than offset since 1880 by a decline that occurred east of the Central West. This decline, the result of many factors, is presented in the following tabulation (adult sheep to the nearest thousand):

Section.	1870	1880	1890	1900	1910
New England States	1,450,000	1,362,000	937,000	563,000	306,000
Middle Atlantic States	4,249,000	3,802,000	3,341,000	2,089,000	1,391,000
Southern States	4,474,000	5,077,000	5,047,000	3,415,000	3,172,000
North Central States	11,165,000	10,566,000	9,450,000	6,900,000	6 535,000
Central Western States	2,474,000	3,152,000	2,899,000	3,217,000	3 574,000
United States	28,478,000	42,192,000	40,876,000	39,853,000	39,644,000

In New England, owing to local market conditions, the decline became precipitate during the eighties. In the other eastern sections the proportionate decline did not become especially rapid until the nineties, when depressed business conditions and very low wool prices opened the eyes of the eastern wool growers to the real status of that enterprise. The gain in the southern flocks during the seventies was a natural recovery from war-time losses, though probably accelerated by the high protection enjoyed by the wool grower at that time. Nearly half of the decline in the South during the nineties occurred in Kentucky, Tennessee, and West Virginia. These three States contained almost half of the sheep in that section both at the beginning and at the end of the decade. By 1910 Kentucky

and Tennessee experienced a slight gain and contained two-fifths of the sectional total. The flocks in Ohio, Illinois, and Michigan shrank nearly one-third during the nineties, while the others in the North Central division (Indiana and Wisconsin) declined much more slowly. The New York and Pennsylvania flocks, which contained over nine-tenths of the sectional total at both the beginning and the end of the decade, lost two-fifths of their number during the nineties.

Since 1910 there has been a gradual falling off in the number of sheep and lambs reported for the country as a whole by the estimates of the Department of Agriculture, until 1914, with slight gain in 1915. East of the Mountain region there has been a net gain in the number of sheep, increases in Texas and in many of the central tier of States east of Colorado having more than offset declines elsewhere. In the Mountain region, however, a striking loss has been reported, the decline having been over seven and one-third million head from the estimated number in 1910 (233). But it seems probable, as will be shown later, that this decline has been more largely in lambs and wethers, and that so far as the stability of the sheep industry is concerned, it has been more apparent than real.[15]

FACTORS WHICH AFFECTED THE SHEEP INDUSTRY AFTER 1870.

The change in the geographic distribution of sheep was due in part to the growth of wool production the world over, particularly in regions producing wool which competed with the domestic clip—in South America, Australasia, and South Africa. Owing to the

[15] In considering changes in sheep distribution as depicted by census figures it must be borne in mind that there were intermediate steps which are not shown by them. Estimates of the Department of Agriculture show an advance for all sections but the South and the Middle Atlantic region between 1880 and 1884. The reduction in number of sheep, as shown by the census between 1880 and 1890, would therefore seem to have occurred between 1884 and 1890.

But there seems to be some discrepancy in the figures of the Statistician of the Department of Agriculture with reference to the far West. A rapid gain was reported for the far West prior to and including 1884. A decline of 6,500,000 head is reported to have occurred from the estimate for that section in 1884 to the census figure for 1890, or to the estimated number for 1889. Wool commanded a fair price for those years, though considerably below what had been secured for some time prior to 1884. On the other hand, during the period of hard times and free wool from 1894 to 1897 when prices were but a little more than half the level from 1884 to 1890, the Statistician estimated a decline of only a little over a million head in the far West. Such a disparity in the declines which occurred would seem at variance with the facts, and the evidence appears to indicate inaccuracy in the far West estimates of the eighties. It would seem highly probable that the estimates of the early eighties exaggerated the increases which occurred, and also exaggerated the subsequent decline (231). In 1890 the tariff placed the duties on wool imports at practically the 1867 figure, the small reduction made in 1883 thus being corrected. Between 1890 and 1893 there was another temporary gain corresponding to that of the good times of the early eighties. Following the panic of 1893 and the tariff of 1894, which let in wool free of duty, there came a pronounced decline in the number of sheep in the country. The number in 1893 was estimated at 47,250,000, in 1897 the estimate was 36,800,000, a fall of nearly 10,500,000, or 22 per cent. Although it has been stated that this decline was exaggerated, it appears more reasonable, in view of the economic factors, than that reported during the eighties. The tariff of 1897 restored duties to the 1890 level, and the number of sheep between 1897–1900 increased somewhat in every section except the South (227 and 231).

continued increase in world production following 1870, wool prices fell markedly and forced wool growing out of the less favorable localities. Competition with other farm enterprises and continued development of transportation facilities attended by a pronounced lowering of freight rates, particularly on bulky products, were equally important in furthering the shift in the sheep industry.

EFFECT OF INCREASE IN WOOL PRODUCTION OF THE WORLD ON THE SHEEP INDUSTRY OF THE UNITED STATES.

Wool exported from Australasia increased from an average of 148,000,000 pounds for the five years ending in 1870 to 647,000,000 for the five years ending in 1899, or 337 per cent. South African exports for the same periods increased more than 100 per cent, and South American (River Plate) about 150 per cent. The North American clip increased practically 66 per cent, and the United States clip at the same rate (from an average of 165,000,000 to 276,000,000 pounds) (234). The English and European clip decreased somewhat. The wool production from other regions increased nearly 114 per cent. The world production reaching the great manufacturing centers of Europe and North America increased from an average of 1,293,000,000 pounds for the five years ending 1870 to 2,287,000,000 pounds for the five years ending in 1899. This growth had slowed up somewhat after 1890 (235). The production of the United States, therefore, expanded during this period much less rapidly than that of the Southern Hemisphere, whence came the bulk of the clip competing with our own.

Since 1900 the average annual world production of wool for use in the manufacture of clothing has been practically stationary at about 2,250,000,000 pounds, of which Australasia has contributed about 800,000,000, South America 400,000,000, and South Africa 130,000,000 pounds, or close to two-thirds of the total. Great Britain has contributed about 125,000,000, and the Continent 470,000,000 pounds. North America has contributed an average of approximately 325,000,000 pounds a year (235A). The Northern Hemisphere, therefore, has contributed but a little more than one-third of the total. With the exception of a few years, from 1900 to 1915, the estimated domestic clip of this country has hovered fairly closely around 300,000,000 pounds and has averaged 303,250,000 pounds, 7 per cent above the average for 1891–1900 (283,330,000 pounds) (236–8). Exports from South America for 1912–13 show a slightly larger percentage of gain, from Australia a 30 per cent gain, and from South Africa an increase of 113 per cent (238). The Southern Hemisphere has continued to outstrip this country in the production of competing wools.

A pronounced gain in the average weight per fleece is responsible for the slight gain in wool production in the United States, although

the number of sheep has been declining since the middle eighties. The weight per fleece averaged about 4 pounds in 1870, 4.8 pounds in 1880, 5.6, 6.3, and 6.8 pounds in the following census years. There has been no appreciable change in recent years (239).

COURSE OF WOOL PRICES.

After the slump in wool prices of the later sixties the wool market of the world strengthened in the early seventies and the price advanced considerably. Then, with a steadily increasing world-wide production, a fairly steady decline set in until the late nineties, interrupted by a temporary rise in the early eighties, when business had recovered from the panic of 1879. The gold price in the eastern markets for fine, medium, and coarse Ohio washed wool for the five years ending in 1875 averaged 51.6, 50.6, and 45.7 cents. For the 10 years ending in 1897 the same grades sold for an average of 26.1, 29.4, and 24.8 cents per pound. For the 10 years following 1897 the price averaged 30.5, 32.3, and 29.2 cents, respectively (240). The greater part of this last rise in price was due to the tariff of 1897, which followed three years of free wool under the tariff of 1894. The price of the above-mentioned grades for the clips of 1894, 1895, and 1896 averaged only 19.1, 21.1, and 19 cents, respectively.

EFFECT OF WOOL PRICES ON THE SHEEP INDUSTRY.

With prices declining so steadily after the early seventies, the woolgrowers east of the Rocky Mountains soon found it advisable to place much less reliance on that product. Accordingly, the flocks in the East and the Middle West declined as previously outlined. This decline was predicted in the early eighties (241).

The import duties (241C) on raw wool in 1883 were not sufficiently lowered to do much more than secure a new weeding out of the least profitable animals or a further limitation of the flocks on land better suited to other enterprises. This appears to have been due largely to the psychological effect of the tariff decrease, as the change in the wool schedule appears to have had little or no effect on wool prices (241B). The panic of 1893, and the period of free wool (three years) beginning in August, 1894, opened the eyes of the woolgrowers to the fact that woolgrowing as a principal enterprise had had no economic place in the farming States for some time. Indeed, wool production with such prices as were then received was ruinous save in the most favorable situations, and, except in new sections, sheep east of the Rockies were butchered for pelts and tallow by thousands (241A). Neglect and disease carried off thousands, just as during the years following the Civil War. According to Department of Agriculture estimates, the number of sheep in the New England States decreased 43 per cent, in the Middle Atlantic States 47 per

cent, in the South 31 per cent, in the North Central States 46 per cent, in the Central West 26 per cent, and in the far West 5 per cent between 1894 and 1897. As already noted, the decline in the far West was almost entirely in Texas and California. Nevada, New Mexico, Utah, and Washington lost slightly, while the other States of this section (especially Wyoming, Montana, and Idaho) gained in spite of free wool (242). The pronounced decrease which occurred in the Texas and California flocks was undoubtedly influenced by this period of depression to some extent, but continued agricultural settlement was an active factor. Until agricultural settlement curtailed the range, the wool production in the far West evidently was able to compete with foreign production on even terms.

Although wool was protected by the tariff of 1897, it is significant that sheep showed but small relative increases in any of the States outside of the Central West and far West by 1900. In 1896 it was not believed that there would be any general increase of wool sheep in Ohio (242A). The woolgrowers east of the Central West had had their eyes opened to the real economic status of wool production in the farming States and devoted the greater part of their efforts to other enterprises.

COMPETITION OF OTHER FARM ENTERPRISES WITH SHEEP—INCREASE IN AGRICULTURAL EXPORTS.

But the competition of foreign woolgrowers and the illuminating experience of the period of free wool were not the only factors involved. Following 1870 this country rapidly assumed a foremost place as a grower and exporter of foodstuffs. The development of the West was very rapid, being facilitated by the extension of railway mileage and by the increased utilization of improved farm machinery. The prices received for other farm products were good and were relatively higher than for wool. The growth in the export trade is shown in the following tabulation, the data representing averages per year per period:

Exports of farm products (245A).

Item.		1866–1870	1891–1900
Total value		$240,440,127.00	$703,235,192.00
Per capita value		$6.50	$10.07
Pork (canned, cured, and fresh)	pounds	66,058,820	721,175,588
Lard	do	43,594,004	540,681,280
Live cattle	number	15,400	373,806
Cured beef	pounds	21,989,373	63,313,544
Fresh beef[1]	do	.....	240,729,110
Tallow	do	24,678,343	74,981,904
Wheat (including flour)	bushels	27,816,458	173,044,574
Corn	do	9,598,655	111,436,483
Oats	do	559,499	20,799,778
Number of dairy cows in United States		9,100,000	[2] 16,200,000
Number of other neat cattle in United States		12,800,000	[2] 32,900,000

[1] Data begin in 1877.

[2] 1867–1870, inclusive.

Between 1870 and 1900 the population of this country practically doubled (rising from 38,500,000 to 76,000,000 persons). The grain production and the number of meat animals kept (other than sheep) considerably more than doubled, hence the marked growth of agricultural exports. The movement east of the Rockies after 1870 was, in general, similar to that east of the Alleghenies between 1845 and 1860. Other enterprises offered larger returns than wool growing, and the wool sheep faded into the background.

GOOD PRICES FOR FARM PRODUCTS OTHER THAN WOOL.

Fairly good prices for farm products other than wool and cheap transportation of them to consuming and export centers characterized this period as a whole, save for the four years following 1893 when prices were very low. The fall in price of the later eighties was much less than that which occurred during the nineties. The course of relative prices for agricultural products in general, with the index number for 1861–62 as 100, is presented below (246), and for purposes of comparison the average course of prices of the three grades of Ohio washed wool is also shown.

Item.	1861–62	1870–1884	1885–1893	1894–1897	1898–1907	1908–1915
Farm products	100	128	102	78	104	143
Wool	100	102	76	47	73	79

The average level of farm products other than wool in the second series of years was 28 per cent higher than during the first. During the hard times of the later eighties the average was still 2 per cent above that of 1861–62. From 1894 to 1897, however, the level was 22 per cent below that of the first period. From 1898 to 1907 the average was 33 per cent higher than for the preceding four years, and 4 per cent above that for 1861 and 1862. During the eight years following 1907 an average rise of 37.5 per cent occurred in the relative price level, which was 43 per cent above that of 1861–62.

The wholesale price of wool shows up much less favorably, particularly after the middle eighties. The following tabulation, for the sake of greater detail, presents the average price of fine, medium, and coarse washed Ohio fleece in the eastern markets in cents per pound, gold (246B):

Kind of fleece.	1861–62	1870–1884	1885–1893	1894–1897	1898–1907	1908–1915
	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
Fine	44.5	44.6	31.6	19.1	30.6	30.7
Medium	42.0	44.7	34.7	21.1	32.3	35.4
Coarse	40.0	38.9	30.5	19.0	29.2	33.3

Wool prices averaged nearly the same in the second period as in the first, but in the third there was a drop of 29, 18, and 24 per cent for the respective grades. In the fourth period (1894–1897) the average was 57, 50, and 52 per cent below the 1861 to 1862 level. For 1898–1907 there was an average rise of 11.5, 11.2, and 10.2 cents per pound (60, 53, and 54 per cent), but the respective grades still averaged 31, 23, and 27 per cent below the 1861 to 1862 price. Although the wool market was somewhat depressed from 1911 until 1915, the medium and coarse grades averaged considerably higher from 1908–1915, inclusive. The fine showed virtually no advance. Compared with the 1861–62 level the grades from fine to coarse averaged 31.16 and 17 per cent lower prior to the 1916 clip. The effect on wool prices by the present war demand needs no comment (246C).

Stimulation of wool prices by the tariff had operated to retain wool growing as a prominent enterprise in the farm management of some of the farming States much longer than would otherwise have been the case. The real status of this industry was finally proven between 1893–1897. When high protection was again given, the wool grower east of the Rocky Mountains was in a very small minority—and continued so. The greater profit of other enterprises had been sufficiently demonstrated to retain the flocks practically at the then existing level.

DEVELOPMENT OF TRANSPORTATION FACILITIES AND DECLINE IN FREIGHT RATES.

Following 1870 large gains were made in the railway mileage operated in the United States, and striking reductions occurred in the charges per ton-mile for freight hauled. The following tabulation presents the mileage operated and the revenue per ton-mile on a majority of the roads (246D):

Item.	1870	1880	1890	1900
Miles operated	49,168	89,753	149,902	.....
Revenue per ton-mile	$1.89	$1.23	$0.94	$0.73

The average rates per ton-mile for a number of the roads were as follows:

Year.	Erie.	Wabash.	Illinois Central.	Union Pacific.	Northern Pacific.	St. Louis & San Francisco.	Denver & Rio Grande.
1870	$1.125	.....	$1.953	$3.596	.....	.....	.....
1880	.836	$0.862	1.543	.....	$1.959	$1.997	$3.617
1890	.643	.647	.942	1.138	1.430	1.239	2.054
1900	.588	.558	.650	1.050	.988	1.058	1.340

The following tabulation gives the progressive decline in the cost of shipping a bushel of wheat from Chicago to New York:

Year.	All rail.	Lake and rail.	All water.
	Cents.	*Cents.*	*Cents.*
1870	28.98	19.15	14.93
1880	19.90	15.70	12.27
1890	14.31	8.50	5.85
1900	[1] 9.98	5.05	4.42

[1] For domestic consumption, rate for export wheat was 9.08.

With such declines in shipping costs as are noted above and the rapid increase in railway mileage, the producer of bulky products was steadily placed in a more advantageous position with reference to the wool grower, just as had occurred during the fifties.

RAVAGES OF DOGS—THE EFFECT ON SMALL FARM FLOCKS.

A factor which must not be overlooked in the disappearance of the sheep east of the Rocky Mountains was the continual loss due to dogs. Thousands of farmers who gave up small flocks in years past did so because of dogs. Men with small flocks of pure-bred animals which suffered from ravages of dogs, but who were able to recover from the county only the price of common sheep, had good reason to discontinue the enterprise. Farmers with small flocks of ordinary grades, from which they expected enough returns to pay their taxes, but who lost the best part of their flocks in a single night, only to find that the county funds were exhausted, were often disgusted with the prospect of success and abandoned them. The large farmer, able to keep a shepherd with his animals, or who herded them at night in dog-proof inclosures, suffered far less, relatively, and the question of sheep-killing dogs usually was not of much importance with him. It was the small flockmaster who suffered most. The agricultural press, the reports of the Patent Office, and those of the Department of Agriculture are full of references to the work of the night-traveling dog and the heavy losses therefrom. The complaints began before 1800. Extravagant claims were sometimes made as to the effect of such losses. It was often stated that the dog caused the decline in the East which set in in 1840, embittered shepherds overlooking the economic factor. Probably losses under this head were often used as an excuse to get out of the sheep business, but small doubt exists that thousands of flocks were sold out as a direct result of such depredations. In a recent investigation conducted by the Department of Agriculture dogs were accused of preventing an increase in farm flocks in 60 per cent of the replies received (246A). Dog-tight fences are expensive and not especially easy to maintain. On

the other hand, the construction of a few small dog-tight inclosures for night herding are not costly, remove much of the danger of parasitic infection from constant use of a single paddock and, to a large extent, nullify the dog question. Adequate dog laws[16] and their strict enforcement would lend an immediate encouragement to the farmer desirous of adopting sheep as a permanent enterprise.

CONTINUED CHANGE TO MUTTON TYPES.

Along with the decline in sheep throughout most of the States east of the Rockies, there was also a pronounced change to mutton types. This phase of the industry, as already noted, had made pronounced gains east of the Alleghenies before 1870, and to a more limited extent east of the Mississipi, but the development thereafter was rapid in most of the country east of the Rocky Mountains, particularly after the early eighties (247). It was especially rapid after 1893, and assumed considerable proportions in the mountain region of the West even before 1900 (247A). In fact, there was a very appreciable adoption of mutton rams in the range country during and immediately following the period of low wool prices which began in the middle eighties.

An important factor in this development was the evolution of the Delaine Merino and other Merino strains which carry a good grade of wool on a fair mutton carcass—wool which became a combing wool with the development of machinery for combing wool shorter than that of the typical long-wool breeds (248). The Delaines were a product of eastern Ohio, western Pennsylvania, and northern West Virginia during the seventies and thereafter, though this Merino strain had begun to attract attention before 1860. They became the predominant breed in the old fine-wool district of the Valley of the Upper Ohio by 1890, largely displacing the finer-wooled flocks (many of which carried considerable Saxon blood) which had persisted in a number of localities in this district. While considerable advance was made toward a mutton type, the greatest gain was in length of wool and weight of carcass rather than in quality of mutton. The Delaines have since given much ground to the purely mutton breeds or to the Rambouillets (incomparably improved as contrasted with the breed when first introduced into this country) as a result of endeavors to secure the largest possible returns from sheep raising. This has been particularly true on the ranges, where, in most sections, little Delaine blood is now present (249). Abundant introduction and crosses of the distinctly mutton breeds on the prevailing Merino foundation of the seventies have also operated to in-

[16] What appears to be an effective dog law if enforced, is that in Virginia, where a man who lets his dog roam abroad unaccompanied by his owner is guilty of a misdemeanor and subject to a heavy fine. This merely means that any farmer is at liberty to shoot any stray dog and the dog's owner may have a good reason for keeping quiet about it.

crease the supply of medium and coarse wool as well as greatly to modify the type of sheep.

THE HOTHOUSE LAMB ENTERPRISE.

The Southdown cross on Merino grades for early lambs remained popular after 1870 in parts of the East where the old Merino foundation in the flocks was not entirely discarded (249A). This cross was very popular in some sections in the development of the "hothouse lamb" enterprise which became general in parts of the East and Middle West, and which received especial attention during the depression of the nineties. The best feeders "ripened" such lambs in six weeks, while many good growers butchered them by the end of the eighth week after birth. The lambs were dropped late in December or in January, as a rule, and the carcasses usually weighed from 25 pounds up, the best ones usually from 30 to 35 pounds at 6 to 10 weeks of age. When nicely ripened high prices were secured, and good feeders found this profitable. The market was good from the middle of January until the end of April, when early lambs from the South, largely Tennessee and Kentucky, began to reach the northern market. Until then the wholesale price for hothouse lambs in New York was usually $5 to $10 per head, depending on quality and appearance. There was also a general development of the early-lamb industry, the lambs being dropped in February and March and marketed in May and June at a weight of about 50 to 60 pounds. The Tennessee farmers already alluded to led in this enterprise (249B), Kentucky lambs not usually appearing on the market before June. With the continued development of the early-lamb enterprise the hothouse lamb season has been advanced considerably. The lambs now reach the market by Christmas and the greater part of them have been disposed of by early March.

Another development at this time was the feeding of range sheep in the corn belt. A few men had been following this practice since shortly before 1880, but it underwent a rapid extension just before 1890. This growth was largely due to the packers who, lacking sufficient mutton supplies at Chicago and Kansas City, sent buyers into the range country to secure fat wethers for slaughter. Animals not sufficiently fat off the range were sent to feeding stations, largely in Nebraska and Kansas, to be grain fed during the winter. Farmers in these States, and in Iowa, quickly followed the lead. In the winter of 1889–90, 625,000 head were so fed in Nebraska, 200,000 head in Dodge County alone. The great bulk fed were 4 and 5 year old wethers and aged ewes, few but cull lambs (except Utah lambs) reaching the feeding yards at that time. The enterprise was quickly found to be as speculative as in later years. In 1891–92 extensive feeding of similar sheep began at the stock yards near St. Paul and Minneapolis, where wheat screenings and mill stuffs were largely fed.

In that winter 49,000 head were fattened (249C). This rapid development of the mutton market undoubtedly was one reason why sheep expanded so rapidly in the mountain region during the nineties.

DISTRIBUTION OF MUTTON BLOOD, 1870 TO 1900.

In 1870, 80 per cent of the American sheep were Merinos or Merino grades. In 1900 the Merinos and the English breeds (with their crosses carrying 50 per cent or more of mutton blood) were about equally important. The former largely predominated in the woolgrowing region of the far West, and the latter in the farming States east of the Rockies. In the range country 30 per cent of the flocks or the offspring from them were of the mutton type, while between 70 and 80 per cent of the animals in the farming country were predominantly of English blood in 1900. The Central West was full of cross-bred sheep of varying degrees of excellence in 1906 (250). Longwools were more numerous than the other mutton breeds in the earlier introductions of such blood into the Middle West, but they were soon replaced by the various Down breeds to a great extent. The Downs proved better adapted to the variable climate (251).

The decline in number of sheep in the Middle and Central West, following 1893, evidently was largely a decline in the Merinos as a wool breed, leaving the mutton types in a large majority, with wool a secondary consideration, except in parts of the Ohio district—eastern Ohio, adjacent parts of Pennsylvania and West Virginia, and a few counties in southern Michigan. By 1910, so far as the farming States east of the mountain region were concerned, woolgrowing as a separate enterprise with little or no emphasis on mutton, was virtually limited to parts of the hilly section of southeastern Ohio and near-by counties on the West Virginia side of the Ohio River and in extreme southwestern Pennsylvania (253).

MUTTON BLOOD ON THE RANGE IN 1910.

A temporary scarcity of fine wool for a few years just before and following 1900, principally due to prolonged droughts in Australia, appears to have checked the influx of mutton blood on the American range for a time, but this was short lived (252). The investigators for the Tariff Board in 1910 found that in the flocks on which data were secured—practically 60 per cent of the range rams used in the Rocky Mountains and the coast districts and 10 per cent of those in the Southwest were of the mutton type. In the mountain section they found that nearly 30 per cent of the range ewes in such flocks were of that type (254). On the other hand, two-thirds of the wool clip west of the Missouri River was at that time classed

as of the fine or fine medium grades, while only one-fourth to three-tenths of that east of the Missouri would make such grades (255). Virtually all of this fine-wool clip of the farming States undoubtedly came from the Ohio district. This percentage figure for the wool clip would seem to indicate that at least the range ewes were predominantly of the Merino type. It would also seem that the flocks on which data were secured by the investigators were to a considerable extent typical of the more easily accessible ranges. The flockmasters in such localities were the first to make the change to the mutton cross, because they could market their fat lambs with a comparatively short drive to the shipping point. On the more distant ranges the change to mutton rams was much slower. It has been estimated by persons well posted on the subject that not more than 12 per cent of the range ewes in 1909 carried 50 per cent or more of mutton blood, but that 50 per cent of the lambs marketed were of the mutton type. This would indicate that not more than 40 per cent of the range rams were mutton rams (256).

PROPORTION OF MUTTON BLOOD IN 1915.

Owing to a drop in wool prices after 1910, and a marked rise in the price of mutton, the change to the mutton cross on the range has been hastened in recent years. The subsequent prospect of free wool accentuated it (259). The wool growers were keenly aware of the necessity of securing larger returns per sheep than could be gotten from wool alone. Another factor in the change was the increasing cost of production on the range. It has been claimed that the cost of growing wool has nearly doubled in the 10 years since 1907 (260). It has been estimated that 50 per cent of the range ewes are now of the mutton type (carry 50 per cent or more of mutton blood) and that 80 per cent of the lambs marketed in 1915 were mutton lambs (257). This would indicate that approximately three-fourths of the range rams are mutton rams at the present time. It is believed that only half as many fine-wooled rams were used on the ranges in 1915 as in 1909. There has also been a pronounced increase in the use of longwool blood (258), particularly on the ranges north of Arizona and New Mexico. The half-bred Rambouillet-Cotswold, Lincoln or Romney ewe (principally the Cotswold cross) is the favorite range ewe save in the rougher and less favorable sections. In such localities a three-fourths blood Rambouillet, or a still higher Rambouillet bred ewe, is the favorite, due to its superior herding propensity and hardihood. The smaller Down breeds usually are not as popular with the range sheepmen for crossbreeding as the longwools (263), save in the production of market lambs, where the Hampshire is used in preference to the other Downs.

EFFECT OF IMPROVED TRANSPORTATION FACILITIES ON THE MUTTON CROSS.

The continued development of transportation facilities in the range section of this country was a factor of appreciable importance in the change to mutton types in the far West. Without such extension and the resultant ability to ship the stock after a comparatively short drive, the adoption of mutton blood on the range would have been much slower, in spite of the largely increased demand and higher prices for lamb and mutton of the past decade or more. It must be remembered, however, that the railway development in the far West largely antedates the change to mutton types.

EFFECT OF CROSSBREEDING IN THE SOUTHWEST.

Owing to climatological factors, the ranges of Arizona and New Mexico are much better adapted to the Merino than to mutton sheep, and therefore are deemed the natural home of the fine-wool grower in this country. Elsewhere in the far West the ranges are relatively much better suited for the production of crossbreds and mutton. The relatively slight admixture of mutton blood in the southwestern flocks until 1910 had made the animals popular with sheepmen of the northern and northwestern ranges for maintaining a Merino foundation in their breeding sheep since the advent of the mutton type and attendant difficulty in keeping uniform ewe flocks for breeding purposes. Of recent years, owing to the pronounced mutton crosses, there has often been a deficiency of Merino breeding stock on the range, and the flockmasters north of Arizona and New Mexico have had to draw on the southwestern section for stock ewes to a small extent (262). The rapid increase in crossbreeding since 1910 was quite marked in parts of the Southwest, however, and is said to have presented a problem to some sheepmen on the other ranges because of the increasing difficulty in securing uniform breeding ewes with which to maintain the pronounced Merino foundation usually deemed necessary for the hardihood and foraging and herding qualities generally thought essential for successful management on the open range. It is claimed by some persons that, owing to the character of his range, the southwestern flockmaster probably will not find it permanently as profitable to breed for mutton as for stock sheep, particularly with the rise in price of such animals in recent years. At the same time the high cost of stock ewes undoubtedly has encouraged a large proportion of the sheepmen to breed their own rather than to replenish by purchase. Many men breed a part of the ewe flock to Merino bucks for flock maintenance, and use a mutton cross on the remainder for market purposes. In recent years, however, the breeder's art on the range seems to have taken on a decidedly makeshift character.

DEMAND FOR A NEW TYPE OF RANGE SHEEP.

Changing conditions are now calling for a dual-purpose animal of a type entirely different from any that has thus far been developed in this country, a strain that combines high mutton quality with the herding and foraging qualities of the Merino. Strong hopes are entertained for the Corriedale, recently introduced from New Zealand, as a dual-purpose animal, especially when used on the first cross from Lincoln or other longwool rams on Merino ewes. The climatic conditions in much of New Zealand and the resultant effect on natural and tame vegetation are so different from conditions on much of the western range in this country that the Corriedale, developed for the New Zealand environment, would not seem to be the type best suited to a large part of the mountain section. The strength of its Merino heredity may, however, be sufficient to overcome adverse range conditions. Certainly it should greatly facilitate the evolution of a type peculiarly fitted for the western range (263A).

CROSSBREEDING IN COMPETING COUNTRIES.

The change to the mutton cross is by no means confined to the United States. New Zealand has shipped a preponderance of coarse wool for many years. In 1912, 93 per cent of her wool was of the crossbred or mutton type. In 1885 the Australian wool clip was almost entirely Merino. It is stated that in 1915 as much as 35 per cent was crossbred, representing a development of very recent years. In South America the change to mutton crosses began in the early eighties, at about the same time as in New Zealand, and assumed large proportions by 1904, since when there appears to have been little increase. The development of the frozen-meat trade was responsible for the influx of mutton blood in the Antipodes (261). In the Americas, as well as in Australasia, though less recently true of New Zealand, "flocks of many generations of breeding for wool have been dissipated in a few generations of breeding for mutton" (261A).

THREATENED SCARCITY OF FINE WOOL AND POSSIBLE EFFECT ON THE MERINO BREED.

In many range districts there has been a rapid retrogression in the quality of the wool clip with the advent of the pronounced mutton cross in recent years, but the high price for lambs and mutton has more than offset the relative decline of a cent or two per pound for the wool. Nevertheless, the steady, world-wide increase in production of "crossbred" wool, and resulting decline in the production of Merino wool for many years, would seem to threaten a scarcity of Merino fiber in the near future. In 1914, just prior to the war,

fashion appeared to be turning toward fabrics made of such wool, and there was an increased demand which had appreciable effect on the price. The war demand for coarser wools nullified this tendency, which may have been but a temporary phenomenon (263B). This will be decided by future developments. If the temporary conditions become permanent after the war the threatened extinction in this country of the Merino breed will doubtless be checked if the price of such wool is raised very much. Most range sheepmen, under present conditions of management, prefer a strong Merino foundation in the flock, and will welcome any change in market demands which would react favorably toward flocks having a strong infusion of Merino blood.

CONCLUSION.

The future of the sheep industry in this country seems fairly well indicated by changes which have occurred since 1900. The American frontier has vanished. The advance in land values between 1900 and 1910 proves this point, as does the continued advance since 1910. A greater intensity of culture and fuller utilization of the land area is therefore indicated. There are no more great areas of unused land whither the sheep may be driven, and the present grazing area is now stocked to its capacity. Continued agricultural settlement has operated in recent years to curtail to a considerable extent the range area which is available. The carrying capacity of the ranges may be increased as better control of the grazing activities is adopted, as is admirably exemplified by the improvement in capacity of the national forests, but an extension of sheep raising due to that factor will be of slow growth.

So far as concerns wool production as a dominant enterprise, there seems small likelihood of a pronounced increase in the number of sheep in most other countries, or on other continents, aside from equatorial regions. The only sheep-producing countries of any importance which show an appreciable increase in their sheep population in recent years are New Zealand, British South and East Africa, and Uruguay. British South Africa and Uruguay are the only prominent sheep countries which show an appreciable recent increase in sheep per capita (263D).

In equatorial regions any increase which may develop must undoubtedly take place in the distant future, as existing climatic and hygienic conditions are quite adverse to the sheep industry as now conducted. It would seem that a marked addition to the world's population of wool sheep could occur in central Asia and in China, which contribute a large part of the supply of carpet wool, bnt there appear to be good reasons against such an immediate possibility. Central Asia is already well supplied with sheep, though improve-

ment in the character af the wool clip may take place in the future. and attention to pasture improvement in connection with better wool strains may confidently be expected to result in an increase in both sheep and wool in the years to come. A large part of the vast territory of China is so densely populated with human beings that there is little rough or waste product left for sheep, and those already there consume the supply, while the inherited opposition of the inhabitants in the more distant Provinces to any change will probably defer a betterment or enlargement of the flocks in those regions for a considerable period. It would, therefore, appear that for a long time to come the principal competition to which American wool will be subjected will be from regions already approximately fully populated with sheep. Soon after the end of the European war there will undoubtedly be a fall in the price of wool from the existing war-time level, but it is quite possible that this decline will be but temporary. In view of the stationary wool production of the world and continued population increase in the past decade, it seems probable that wool prices will experience a gradual rise in the future from the price level which prevailed prior to August, 1914.

THE TENDENCY ON THE RANGE.

On the western ranges the tendency, save as modified by the war, probably will continue toward the adoption of mutton types in spite of earlier insistence on the characteristic foraging and herding qualities of the Merino breed. However, there seems small likelihood that conditions of range management will change enough for a long time yet to come (if ever) to make these qualities distinctly a minor consideration. It is quite possible that a Merino strain will be developed which will hold its own in the most favorable localities against the more distinctly mutton types (253C). The herding quality of this breed will become a matter of less importance if fencing of the range is ever permitted, and under such circumstances the foraging quality also would become but a minor consideration on part of the range area. On the other hand, a very large part of the range country is of so little grazing value, or is so rough that fencing would not appear to be practicable. Sudden and very destructive storms are of such common occurrence in most of the range country, that, even under fence, the herding quality of the Merino will always be an important factor in the type of sheep run on the range. Otherwise losses entirely out of proportion to what would be sustained if the sheep were herded would often occur in times of stress. The widely scattered "bands" would be almost entirely at the mercy of the elements, quite apart from heavy losses due to predatory animals. The extensive fencing done in Texas has to a considerable extent been rendered practicable by more favorable climatological

factors. In any case, however, greater attention to cross-breeding will further increase the size of the range sheep, which will then require more land per head and thus at least in part limit the numerical increase which otherwise would occur as a result of improvement in range management and in the carrying capacity of the range.

POSSIBILITIES OF THE GROWTH OF THE SHEEP INDUSTRY.

Any pronounced increase in the number of sheep kept in the United States in the near future does not seem possible on the range under present conditions, and if such a gain occurs in the national sheep population it must take place largely in the "farming" States, the region east of the Rocky Mountains. Such an increase must also be based on the mutton types of sheep with the possible exception of parts of the Ohio district. The time is long since past when wool production as a major enterprise was profitable in the farming States as a whole.

At the present time both the cheap wool and the cheap mutton from the range are things of the past. In 1914 the cost of producing a lamb (including most items of interest charges), after crediting the wool clip, was $2.18 in California; $2.46 in Colorado, Arizona, and New Mexico; and $2.45 in the rest of the range country (Utah, Nevada, Oregon, Washington, Idaho, Montana, and Wyoming). The net profit per lamb was $1.02, $0.34, and $1.40 in the three sections, respectively. The net profit per sheep in the flock (excluding lambs) was 78, 20, and 99 cents, respectively (264A).

With a proper correlation of enterprises and selection of mutton types giving high production of lambs per ewe (particularly the Down breeds), the farmer east of the Rockies probably is now able to compete with the range very nearly on even terms. The number of farmers maintaining small permanent farm flocks was on the increase in 1911 in the greater part of the Middle West (264). There had also been an increase in that section in the feeding of range lambs and the breeding of range ewes for early lambs to be disposed of before the range lambs appeared on the market (265). There are indications that the last-named activity has declined in the past few years (266), owing to the scarcity of such ewes attendant on the high prices for mutton. This may or may not be permanent, but its effect seems plainly in evidence at the present time. The recent foot-and-mouth quarantine somewhat accentuated the condition.

SIGNIFICANCE OF MARKETING AND SLAUGHTERING STATISTICS.

A close scrutiny of recent live-stock statistics would seem to indicate that the above-mentioned increase in small permanent breeding

flocks in the farming States has been continuous during recent years. It would also appear that the reported sheep population of the country as a whole has been tending more and more toward breeding animals. Average annual receipts of sheep at the seven principal markets for 1912–1915, both inclusive, were 16 per cent larger than the average for 1908–1911. The average annual shipments from these market centers[17] were only 5 per cent larger. This shows a pronounced increase in the percentage of killings on arrival at these markets. The quarantine at Chicago from November to the close of 1914 and during all of 1915 had an appreciable effect on shipments, large numbers of animals being slaughtered at the end of 1914 which otherwise would have been shipped as feeders. In 1915, when the fact of the quarantine was fully known, this was not of so much importance as during the last two months of 1914 (267). The above data would suggest that the number of feeder and stocker sheep fed in the Middle West declined to some extent.

The average shipments of feeder and stocker sheep from the seven principal markets (Chicago, Omaha, Kansas City, St. Louis, St. Joseph, Sioux City, and St. Paul) show a decline of 17 per cent for 1912–1915, inclusive, as against such shipments for 1908–1911. This decline is largely accounted for by a pronounced increase in the feeding of lambs in the far West (including part of Nebraska), before they reach the market. The marked rise in lamb prices has encouraged this practice very much. The decline has also been somewhat accentuated by an increase in the direct purchase of range lambs for feeding purposes in some States east of Nebraska. A smaller percentage of the animals reaching the markets of the Middle West have been feeder type, and, as a result, fewer feeders have been fed (268). Also, owing to the price of lamb and mutton, many animals have been butchered which otherwise would have reached the farms as feeders.

The number of sheep butchered under Federal inspection rose steadily from 11,000,000 in 1910 to practically 15,000,000 in 1914, although estimates of the Department of Agriculture show that the total number in the country was slowly decreasing (269). The average price per hundred pounds for sheep on the Chicago market rose steadily from $3.95 in 1911 to $5.55 in 1914, and for lambs from $5.95 to $8. In 1915 sheep averaged $6.30 per hundred pounds, and lambs $9, both figures being high records (270). On the other hand the number of sheep butchered under Federal inspection in 1915 was more than 2,000,000 less than in 1914, the drop being 14 per cent

[17] The shipments (duplications in shipment figures are mutually corrective for both periods) from the markets include animals shipped to outside packers and butchers, feeder sheep, and sheep for export. The number exported increased 100 per cent on the average since 1911, but the total exported is so small as to be practically negligible.

(271). As there has been a net increase in number of sheep in the farming States, and the bulk of this gain has been in the Middle West, it would therefore appear that range flockmasters have been selling off the bulk of their increase each year in response to the high prices, without adequate replacement of their breeding flocks, retaining their old ewes to a considerable and unusual extent. The pronounced drop in number of sheep slaughtered in 1915 would seem to indicate that they had reached the point where rehabilitation of the breeding flocks was necessary.

SIGNIFICANCE OF THE MARKET STATISTICS WHEN COMPARED WITH DEPARTMENT ESTIMATES.

Estimates of the Department of Agriculture as to the number of sheep on farms on the first day of January each year show a slow decrease for the country as a whole since 1910, and for most of the farming States, but in 1915 the reported increases east of the range country have more than offset these decreases. These estimates are made up in December. With the high mutton prices which have prevailed, and the attendant enhancement of the lamb market, there has been a steady tendency for farm-raised lambs to be well out of the way before that time. It seems extremely probable, in view of the greater percentage of killings on arrival at market, and the decline in feeder shipments, that the department estimates of the number of sheep on farms on January 1 have been more and more tending toward returns of breeding animals kept in permanent farm flocks east of the Rockies. It is therefore likely that so far as concerns sheep as a permanent farm enterprise east of the Rocky Mountains, the industry is in a much more flourishing condition than is often supposed. It would also appear that the striking decline in number of sheep in the far West which has been reported since 1910, a decline usually considered predominantly due to agricultural settlement (272C), has been very largely confined to market stock and wethers. High prices have accelerated sales off the range and relatively few lambs are included in the department estimates made up in December. The accelerated change to mutton blood means that wethers retained for wool production have undergone a marked decrease. Evidently the estimates of sheep on the range, as on the farm, have been tending more and more toward covering breeding flocks exclusively. The relative increase in the number of breeding animals means that, when there is a demand for it, an increase in the national sheep population can occur much more rapidly than would be suggested by a mere comparison of present and past numbers of mature sheep in the country, and that as regards the fundamental stability of the industry, it is in a more flourishing condition than would at first seem evident.

AN INCREASE IN THE NUMBER OF SHEEP IN THE FARMING STATES PROBABLE—INDICATED CHARACTER OF THE FARM FLOCK.

Considering all the factors, it seems logical to look for a steady, though slow, increase in the number of sheep in most of the farming States east of the mountain district, an increase made up largely of sheep kept in small flocks on general farms as a minor enterprise for the utilization of products of low value which otherwise would largely be wasted or less fully used. In 1914 it was ascertained that, with the possible exception of New England, in 36 States east of the mountain region the number of sheep might be increased 150 per cent without displacing or reducing other live-stock enterprises on the farm and without making appreciable effort to increase the existing supply of feed. In other words, the number of sheep could be increased practically 22,000,000 head and this increase fed largely with forage at present imperfectly utilized or only as litter (272A). This increase would be sufficient to make the United States entirely independent of other countries for its normal supply of new wool of Class II, and in addition, so far as volume is concerned, would make unnecessary the normal importation of Class I wool. Obviously the clip from mutton breeds could not compete in fineness with the wools of Class I which we import from the Southern Hemisphere. The average net annual imports of Classes I and II from 1910 to 1915, inclusive, were 122,000,000 pounds. The average imports of Class III wool were 98,000,000 pounds (272B). Part of the latter is used for clothing, but it is primarily a carpet and blanket wool. At the same time, after the flocks were secured, such an increase in the sheep population would add approximately 4 per cent to the Nation's meat supply—on the 1909 basis. In that year the total of meat and lard produced was 16,952,000,000 pounds. In the farming States 22,000,000 sheep in breeding flocks would give about 18,000,000 (80 to 85 per cent) lambs and cull ewes for slaughter each year. The weight of the dressed carcasses and tallow would average about 40 pounds per head.

The possibilities for an increase in the number of sheep with, or attended by some attention to a greater supply of feed, are very promising indeed. The question of green forage crops for small farm flocks should be easy of solution, and at but small expense. The fertilizing value of sheep when fed such crops on land deteriorated by continued grain growing is unquestioned (271A). The economy and the profit of such an enterprise when given proper care was well stated by a corn-belt farmer in 1861, when he called attention to the fact that men farming a quarter section and selling grain or live stock or both could keep at least 100 sheep on what was wasted (272). The small breeding flock so kept pays high returns where a large

flock would often be kept at a loss, as many farmers in the Middle West have discovered. Such flocks have a high value for weed eradication, and no small value in fertilizing the land.[18]

Such was the character of the farm flocks of the Mississippi Valley in 1911, and this has characterized Canadian sheep husbandry for considerably more than half a century. East of Manitoba it is said to be comparatively rare to find more than 40 to 50 breeding ewes on a farm in Canada (274). In the western Provinces, aside from the range district of southwestern Saskatchewan and southern Alberta, the sheep industry is practically entirely on a farm-flock basis, the number of animals per farm ranging from 50 up to 400 head. The great bulk of the Canadian sheep are of the mutton type. Ewe flocks of 40 to 50 or even 60 head would seem to be the most suitable size for general farms of moderate acreage in this country. Such a flock warrants the purchase of a good ram, uses him fully, gives sufficient returns with the high prices of recent years to secure the adequate attention which is absolutely necessary, requires but little time during the busy season if the lambs are dropped early, requires but small outlay for shelter, and, excepting the period from a short time before lambing until the lambs are marketed, calls for a minimum of expensive grain feed to get the best returns from lambs, particularly when green forage crops are used. Two or three small dog-tight inclosures for night herding are relatively inexpensive and serve largely to settle the question of the sheep-killing dog.

The animals which are now so kept, and which must continue to be kept in such flocks, are of the mutton type, with wool a secondary consideration. Wool can not be grown alone under such conditions save at a loss. If the present high price of lamb and mutton is maintained, and there appears every reason to believe that such will be the case, there probably will be an increase in the number of small-farm flocks, or an adoption of sheep in such flocks, in parts of the country where such an increase 10 years ago would have appeared unlikely.

SUMMARY.

The outstanding facts in the history of the American sheep industry are (1) the adoption of wool growing and the remarkable

[18] It seems extremely improbable, however, that any increase which may take place will approach the possibilities for a long period to come. A too rapid gain in number undoubtedly would depress mutton prices (irrespective of the effect on the price of medium and coarse wools) to a point where many sheepmen would curtail their flocks. Then, too, the expense of fencing for sheep is a factor which will strongly tend to prevent the adoption of sheep on farms fenced only for cattle. Another factor which should inhibit a too rapid increase in the number of sheep will doubtless be the adoption of this enterprise by enthusiastic farmers with little or no knowledge of sheep management. Such men, if they invest heavily, in many cases will lose heavily, and thus strengthen the conservatism of their neighbors.

development of the Spanish Merino as a wool-bearing animal by the earlier flockmasters, (2) the decline of the eastern wool industry and the westward migration of the wool sheep, and (3) the change to mutton types both on the farm and the range.

THE ADOPTION OF WOOL GROWING AND THE DEVELOPMENT OF THE SPANISH MERINO.

Until 1808 wool growing was purely a minor enterprise on the farm. The wool was largely consumed in the household, and the sheep industry was merely a part of a self-sufficing economy. With the period of restricted foreign commerce which lasted almost continuously from 1808 to 1815, the industry became a major enterprise in the North Atlantic States, and much was done toward improving the wool by crosses with the numerous Spanish Merinos which had been imported in 1810–11.

Following 1815, competition with foreign woolen manufacturers greatly curtailed the output of the domestic mills, and in the absence of a good market, wool growing in the North Atlantic States again became a minor enterprise, though to a considerable extent it retained its new character as a commercial proposition. Until the thirties, although there was a gradual advance in the woolen industry, particularly in the factory manufacture of the coarser fabrics, the household manufacture still consumed a majority of the wool clip; its demand was for the coarser fiber, and there was no incentive to extend the earlier breeding improvements. These, and the Merino sheep, accordingly were almost entirely neglected. A temporary craze for the Saxon Merino during the twenties could not be termed a movement for breed improvement.

Following 1830, a rapid growth in the woolen industry, and a forced dependence of the manufacturers on the eastern flocks or on imports for their raw material, reversed the position of wool growing in the East. Immediate attention was given to breed improvement, and after some controversy the Saxon was discarded for the Spanish Merino. Improvement in size, conformation, and wool clip progressed steadily, particularly in Vermont, while the eastern flocks grew very rapidly. Until 1845 the East was supreme in wool production.

DECLINE OF THE EASTERN WOOL INDUSTRY AND THE WESTWARD MIGRATION OF THE WOOL SHEEP.

Following 1845 better transportation facilities between the seaboard and the trans-Allegheny region, coupled with much lower costs of wool production on the cheaper land west of the mountains, resulted in a rapid gain in number of sheep in that section and a

corresponding decline in the East. During the fifties the sheep industry for the country as a whole was nearly stationary, increases in newer sections little more than balancing the continued decline east of the Alleghenies. The tendency, however, was for the wool sheep to continue to move into areas of cheap land and to decline in regions where the steer and the hog, or the dairy cow, could be advantageously added to the farm enterprise. The Civil War period and its undue stimulus to wool production was really only an incident in the westward movement of the wool sheep into pioneer regions. The striking increases in the eastern flocks at that time were only temporary, while the permanent net increases in the Middle West were not the result of the war but of the high protection enjoyed by the producers thereafter. At the same time a large part of the increase in number of sheep between 1860–1870 was in the newer parts of the Middle and Central West, where a gain was logically to be expected with the westward movement of the frontier. The rough topography in the Ohio district and the attendant encouragement to grazing, supplemented by the shepherding habits of the farmers, was no small factor in the increased number of sheep kept in that area.

After 1870 the opening of the far West resulted in a marked acceleration of the westward movement of the wool sheep and a fairly steady decline in the farming States, a decline which was greatly accelerated during the hard times and the free wool of the nineties, when the keeping of sheep for wool in the farming States almost disappeared except in the Ohio district and in newly settled areas east of the Rockies.

In the meantime steady progress had been made by the American breeders in the development of the Merino as a wool-bearing animal par excellence. Vermont held first place in this activity, and the much wrinkled, yolky, heavy clipping Vermont Merino was in great demand for breeding up the wool flocks elsewhere. After the wool sheep had practically disappeared east of the Alleghenies the Vermont breeders reaped a rich harvest from the sale of breeding animals to western flockmasters and to those in Argentina and Australia. Following 1870 the Delaine breeders of the Ohio district, with their smooth-bodied stock, steadily encroached on the field of their Vermont fellows, but the latter were in first place until about 1890. The last factor in the maintenance of fine wool flocks in Vermont virtually disappeared when the range sheepmen adopted Delaine and Rambouillet blood in his breeding stock during and subsequent to the nineties. At this time, too, the flockmaster in the Antipodes began to abandon the Vermont for other Merino types in his breeding operations.

CHANGE TO MUTTON TYPES ON THE FARM AND THE RANGE.

As wool sheep declined in the farming States mutton types steadily appeared as a more or less important farm enterprise. By 1860 the bulk of the sheep east of the Alleghenies were kept chiefly for mutton, with wool a secondary consideration. The mutton breeds also received considerable attention during the Merino mania of the sixties, but the speculative prices paid for fine wool stock concentrated the desire of most farmers on the Merino. Thereafter the wool sheep steadily gave way before the competition of more profitable farm enterprises west of the Alleghenies. Wool production could not hope to endure in the face of the cheap grain, beef, and pork production of the Middle West. Mutton types, therefore, slowly replaced sheep kept chiefly for wool in that section. The mutton sheep, particularly the high grades of improved breeds, was well able to compete with the beef steer.

The heavy lamb marketed at 6 months of age or less, a later development of the change to mutton types, had nothing to fear from competition with beef production. But the combination of the steer and the hog, and the superior reproductive powers of the latter, obscured the value of the mutton sheep on the rich farming land of the Middle West, while the attempt of many men to maintain the wool sheep and their complete failure resulted in the common belief that the sheep was not a farm animal. As a result the distinctly wool type of sheep practically disappeared in most of the farming States by 1900, while the mutton type was kept in relatively small numbers save in the more favorable locations. The Delaine was developed just before and subsequent to 1870 in an effort on the part of breeders in the Ohio district to secure fine wool on a mutton carcass. The somewhat limited improvement made in the mutton quality was an important factor in the continuance of fine wools on the rough lands of that section, and later made that area a source of pure-bred stock for the range country. The Rambouillet was developed in France, Germany, and this country, on the same principle as the Delaine.

The widespread adoption of Delaine and Rambouillet blood on the range during and after the nineties was in part due to the desire of the range sheepmen to secure more saleable carcasses to supplement the low wool prices, while the rapid crossing of Merino types with purely mutton breeds in recent years (a result of curtailment of the range), rising production costs, low wool prices, and an enhanced demand for lamb and mutton (with resulting rises in the price of such meat), marks the last phase of this change in the American sheep industry. A majority of our sheep now carry 50 per cent or more of mutton blood—i. e., are of the mutton type; and in most sections the wool clip, though still an important consideration, has become secondary to lamb.

In recent years, too, the cost of production on the range, where sheep are kept usually as the sole enterprise, has become so high that the farmers east of the Rocky Mountains are now able to compete with the range on nearly even terms by using mutton sheep as a minor enterprise on the farm and keeping the wool clip subordinate to the lamb crop. Since 1910 there has been a net increase[19] in the number of sheep kept east of the range country, and most of this increase has occurred in the Middle West, where the idea that the sheep was not a farm animal had previously been strongly held. The economy of small mutton flocks fed largely with forage which otherwise would be less completely used, and the production of heavy lambs with a minimum of expensive grain feed, has finally become plain to the American farmer. A new phase in the history of our sheep industry is now developing. This is the return of sheep to the farm. In the future an important and increasing percentage of our meat and wool supply will undoubtedly come from the small farm flock.[20]

[19] The increase in number of sheep in certain States has more than offset decreases in other States.

[20] In this connection, however, it seems probable that New England, except locally, will prove an exception. That section is so densely populated that extensive farm enterprises would seem distinctly out of place save in the more remote parts. (The sheep-killing dog is another deterrent to sheep raising, and a most serious one in a region so densely populated.) Owing to the urban demand, the dairy cow and the truck patch, and to a less extent the orchard, are and must continue to be the basis of New England agriculture. There is much unused pasture land in New England which could carry sheep nicely during the summer months, but the hay land is almost entirely used for the winter keep of milch cows, which experience has shown to be much more profitable than sheep and nearly as efficient a consumer of rough forage. There is room for a considerable increase in the number of sheep in New England to utilize such parts of the pasture area as are too rough for cows, but the scarcity of roughage for winter feed will greatly limit any future increase in the flocks. It seems probable that future gains in number of sheep in New England will be in the form of small flocks, grazed largely as scavengers on surplus pasture areas, for the production of lambs to be marketed from pasture in the fall, or in small flocks kept for the production of the highest grades of early or winter lamb.

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APPENDIX.

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[1] Many thanks are due to Prof. H. C. Taylor, of the University of Wisconsin, who kindly submitted, for the use of the writer, data gathered by various graduate students, under his direction, from the files of the agricultural press and reports of State departments and agricultural societies for the period 1840–1860. A large part of the references of this character which are cited for the years 1840–1860 are from the data loaned by Professor Taylor.

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53. Randall, l. c. p. 32; Bishop, l. c. p. 211–13, 194; Pitkin, l. c. p. 473–4.

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55. Bogart, l. c. p. 239; Bulletin, N. A. W. M., vol. 30, p. 119, 145, 146.

56. Randall, l. c. p. 32–33; Massachusetts Repository, l. c. vol. 5, p. 167 and fol., vol. 4, p. 140; Bishop, l. c. vol 2, p. 246; Niles Register (1822), vol. 23, p. 96; B. A. I., l. c. p. 221–222, 484 and fol., 491 and fol., 497 and fol., 427.

57. Pitkin, Statistical View, l. c. (1835), p. 490; Niles Register (1814), vol. 6, p. 208–10.

57A. Bulletin, N. A. W. M., vol. 9, p. 19–20, 43–4; vol. 31, p. 355–7, 277–8.

58. Ford, Wool and Manufactures of Wool (1894), p. 316–17, Table of Net Imports; before 1822 the amount of raw wool imported was too small to be separately recorded by the Treasury Department; see also Bishop, l. c. vol. 2, p. 269–70; Niles Register (1822), vol. 22, p. 225; Bulletin N. A. W. M., vol. 30, p. 146.

59. See Appendix for the different tariffs on wool; see also Randall, l. c. p. 17 and fol., 33; Sheep Husbandry (1848), p. 158–9; Bulletin, N. A. W. M., Vol. 31, p. 206–7.

59A. Massachusetts Repository, l. c. vol. 5, p. 169; Hunt, l. c. vol. 4, p. 287; Ford, l. c. p. 304.

60. Randall, l. c. p. 159; Fine wool, l. c. p. 17 and fol., 34 and fol.; B. A. I., l. c. p. 231 and fol.; Niles Register (1827), vol. 33, p. 17, 146.

61. Ford, l. c. Table of total imports of manufacturers of wool, p. 336. The value of the imports of 1825–30 is no criterion of the amount imported, due to depressed prices; Special Report, l. c. p. 58; see also Wright, p. 39–40, 46 and fol., 56, for a good discussion. Bishop, l. c. p. 313–15, 321–22, and note.

62. See Appendix 6; also B. A. I., l. c. p. 236–7; Randall, Fine Wool, l. c. p. 37, 41 and fol.; Bishop, l. c. p. 313–14. Randall shows a greater relative gain in the price of medium wool, but many quotations are lacking in his price table.

63. Randall, l. c. p. 37.

64. Niles Register (1827), vol. 33, p. 277; vol. 66, p. 386; vol. 41, p. 214; B. A. I., l. c. p. 499, 236.

65. Randall, l. c. p. 35 and fol. Sheep Husbandry, p. 159.

66. Randall, Fine Wool, l. c. p. 36–7; Bulletin, N. A. W. M. Vol. 9, p. 20, 43–4; vol. 31, p. 277–8.

67. Bogart, l. c. p. 240–242.

68. Randall, l. c. p. 41 and fol., 47 and fol., 37, 61 and fol., 72 note: B. A. I., l. c. p. 239; New York Report (1842), p. 29.

69 Patent Office (1850), p. 211.

70. Randall, l. c. p. 17–18; Sheep Husbandry, l. c. p. 159, 160–3. B. A. I., l. c. p. 237–8 and note: Patent Office (1849), p. 242; (1851), p. 157; American Agriculturist, vol. 24, p. 43; Niles Register (1835), vol. 49, p. 128; vol. 41, p. 477.

71. New York Report (1843), p. 445–67; (1841), p. 271–2; B. A. I., l. c.: Randall, Fine Wool, p. 48–9 Cultivator (1844), vol. 1, p. 128; Niles Register, l. c.

72. B. A. I., l. c.; Randall, l. c. p. 27–8 and note: 72 (note).

72A. Wright, l. c. p. 75; Niles Register (1831), vol. 41, p. 219, 324; Bishop, l. c. p. 360. It does not seem possible that there could have been any more than were present in 1825, considering the number slaughtered thereafter and the lack of a market for the wool other than largely for domestic manufactures. The furor had been all for fine wool.

73. New England Farmer, vol. 6, p. 155; Niles Register (1825), vol. 29, p. 402, 88; Bishop, l. c. p. 315. Contemporary estimates place the number of sheep in 1825 at 15 million. Considering the way the animals were butchered and neglected following 1815, and the poor wool market until the early 20's, this estimate appears quite high. A recuperation to 12 or 13 million head between 1820–25 seems ample when it is remembered that the rage of the time was for quality of wool rather than quantity; while wool manufacturers were flourishing in the West, the number of mills was very small, the output small, and the sheep industry hazardous on account of indifferent care of the ordinary animals in a new country, to say nothing of depredations on the part of wolves.

74. Wright, l. c. p. 75–76; Pitkin, l. c. p. 490–91; Bogart, l. c. p. 166.

76. Bogart, l. c. p. 166–7, 176; Wright, l c. p. 58–9.

77. Randall, Fine Wool, l. c. p. 42. See also Table of prices based on returns of Mauger and Avery in Appendix, this essay.

78. Niles Register, vol. 49, p. 221, 68.

79. Report on the Agriculture of Massachusetts, 1838, p. 5, 45, 136; see also Hazards Register, vol. 1, p. 48.

80. Benton and Barry, Statistical View (1837), p. 106 and preceding.

81. See Appendix for tables of wool prices (from Mauger and Avery); also see Tables of wool prices in Randall, Fine Wool, l. c. p. 42 and fol. (from transactions of Livermore).

82. From tables of prices for New York market in Report of the Secretary of the Treasury (1863), p. 304 and fol.; Patent Office (1847), p. 212–13.

83. Wright, p. 86.

84. Ford, l. c. Table, p. 307 and fol., net imports of raw wool by countries of origin, and table, p. 316; see also Appendix for table of wool imports.

85. Wright, p. 84; Bulletin, N. A. W. M., vol. 30, p. 153 and fol.

85A. Census (1840), p. 359; see also Appendix for number of sheep in different census years.

86. Ford, l. c. Table, p. 316. See also Appendix.

87. New York Report (1841), p. 304–7.

88. B. A. I., l. c. p. 427, 499; Prairie Farmer, vol. 5, p. 252; Niles Register (1829), vol. 36, p. 399. Compare the Steubenville prices with those in Appendix.

89. Niles Register, vol. 69, p. 54; vol. 29, p. 166; vol. 33, p. 155; Pitkin, Statistical View, l. c. p. 579. Andrews, Report on Trade and Commerce (1853), p. 92, U. S. Senate, Exec. Doc. 112.

90. Op. cit. Bogart, l. c. p. Niles Register, vol. 69, p. 54. Ringwalt, Transportation Systems (1888), p. 111; Patent Office (1847), p. 584, 656. Andrews, l. c. p. 92–3.

90A. Andrews, l. c.

91. Bogart, l. c. p. 241–3, 246–7.

92. Patent Office (1849), p. 191. Hall, Notes on the Western States (1838), p. 128, 130.

93. Patent Office (1849), p. 191; Wisconsin Agriculturist (1851), p. 46, 131, 167, 171, 179, 201, 213, 228; (1852), p. 114; Patent Office (1847), p. 212.

94. Patent Office (1848), p. 552; (1847), p. 212, 584, (1854), p. 53; Cultivator, vol. 3, p. 21–22; Country Gentleman, vol. 5, p. 25; Patent Office (1849), p. 512; Niles Register, vol. 70, p. 21; Andrews, l. c. p. 92, 93; Mass Report (1849), p. 256; Niles Register, vol. 69, p. 54.

95. Patent Office (1847), p. 404; (1851), p. 157; (1854), p. 51, 54; (1849), p. 88, 92, 120, 256, 242–44; (1850), p. 277; Randall, Fine Wool, l. c. p. 106; Practical Shepherd (1863), p. 97–8; Prairie Farmer, vol. 3, old series, p. 3, 207; Department of Agriculture (1862), p. 303; Cultivator, vol. 3, p. 21–2; Cultivator (1850), p. 294.

95A. Patent Office (1850), p. 137 and fol.; Randall, Fine Wool, l. c. p. 42–3, 106 and fol.; Cultivator (1850), p. 294.

96. Prairie Farmer, vol. 5, old series, p. 204, 230, 274; vol. 3, p. 218, 238; Niles Register, vol. 66, p. 387; Hazard's Register (United States Commercial and Statistical Register), vol. 5 (1841), p. 352; Patent Office (1849), p. 245.

97. Patent Office (1844), p. 156.

98. See Ref. 96, l. c.: Prairie Farmer, vol. 9, p. 139, 296, 362; (1851), p. 408, 412; Wisconsin Agriculturist (1851), p. 14, 69.

99. Prairie Farmer, vol. 5, p. 205; vol. 4, p. 133, 161; Patent Office (1849) p. 245.

100. Prairie Farmer, vol. 7, p. 213.

101. Op. cit., vol. 3, p. 39; vol. 12, p. 35.

102. Department of Agriculture (1862), p. 301–2; Iowa Agric. Society (1860), p. 275 & fol.; Prairie Farmer, vol. 3, p. 276.

103. Cultivator, vol. 3, p. 21–22; Hall, l. c. p., 81; Amer. Agriculturist. vol. 1, p. 237.

104. Patent Office (1850), p. 407; Cultivator (1850), p. 294.

105 Bogart, l. c. p. 243; Aldrich Report, Wholesale Prices, Wages, and Transportation, Senate Report 1394 (1893). Part 2, p. 7 and fol., 24 and fol., 34 and fol., 60 and fol., 80 and fol. Report of the Secretary of the Treasury (1836), p. 306 and fol. American Agriculturist, vol. 1, p. 237. Western Farmer, vol. 1, p. 157.

106. Andrews, Trade and Commerce, etc., (1853), Senate, Exec. Doc. 112, p. 380. Patent Office (1847), p. 566; Aldrich l. c. p. 60–63.

106A. Dept. of Agriculture (1862), p. 68; Census (1910), vol. 1, p. 30.

106B. Prairie Farmer, vol. 3 (1843), p. 102; American Agriculturist, vol. 1, p. 176–7.

106C. Dept. of Agriculture (1862), p. 286–7.

107. Patent office (1849), p. 252; Andrews, l. c. p. 4–5, 52, 55–6, 289, 355, 310 & fol., 411, 887, 711, 441–2; Ringwalt l. c. p. 51, 53, 75, 77, 109, 110–11, 120, 113–17.

Report, Chamber of Commerce of New York (1868), p. 131–5, 136–7.

See also Transac. of the Wisconsin Academy of Sciences, etc., vol. 17, part 1, No. 4, p. 243 and fol.

Patent Office (1847), p. 577 and fol.; Tables of canal, lake, and river commerce.

108. Patent Office, 1848, p. 367.

109. Massachusetts Report (1838), p. 45; Patent Office (1850), p. 139.

109A. See 95A, also Patent Office (1849), p. 243–245, 16; Dept. of Agriculture (1865), p. 456–7; Patent Office (1850), p. 405 (1855), p. 24, 28; Country Gentle-

man, vol. 7, p. 237, 268; vol. 17, p. 162, 273; vol. 20, p. 111; Cultivator (1850), p. 291.

110. Cultivator, vol. 7, p. 93, 43, 153, 136, 142, and fol. 149; New York Report (1841), p. 307, 317, 134, 319, 158; B. A. I., l. c. p. 239 and fol.

110A. Bishop, l. c., vol. 2, p. 136.

110B. Transactions of the Worcester County Agricultural Society (1847), p. 38.

111. B. A. I., l. c. p. 240 and fol.; New York Report (1843), p. 395, 440, 445 (1841), p. 134, 158; Cultivator, vol. 9, p. 146–147 (1850), p. 291; Patent Office (1849), p. 92, 102, 119–20, 256, 244; (1848) p. 394, 450; (1850) p. 209, 139–40, 306; (1852) p. 222, 236; (1854) p. 52–4; (1851) p. 137.

112. Patent Office (1849), p. 183–4; (1850) p. 139, 200, 280.

113. Randall, Fine Wool, l. c. p. 56 and fol. 62 and fol. 66–8; B. A. I., p. 486.

114. Randall, Fine Wool, l. c. table, p. 41 and fol.; Aldrich, l. c. part 1, p. 38. See also Wright, l. c. p. 116, 121, and table, p. 354 (based on Report of Secy. of the Treasury (1863), p. 284 and fol.).

114A. See ref. 115.

115. Wright, l. c. p. 108 and fol. 121; Randall, Fine Wool, l. c. p. 40, 46–7; Special Report, l. c. p. XLVIII, L, LIV.

117. Patent Office (1852), p. 222–4–6; (1848) p. 367; Patent Office (1849), p. 112, 245; (1854) p. 53. Transactions of the Agricultural Societies in the State of Massachusetts (1849), p. 256; (1847) p. 212–13.

117A. Patent Office (1847), p. 212–13; Cultivator (1849), p. 234.

118. Census (1900), vol. 5, p. CCXIII.

119. Census (1880), vol. 3, p. 1029, 1035; B. A. I., l. c. p. 947 and fol.; New York Daily Tribune, Nov. 8, 1862, p. 7. See also Dept. of Agriculture (1864), p. 478.

120. Census (1900), vol. 5, p. ccxvi, 708–9; Prairie Farmer, vol. 10, p. 262.

121. Patent Office (1849), p. 244; Cultivator (1852), p. 79.

122. Census, l. c. p. ccxiii, 708. See also Appendix.

123. Census, l. c. p. ccxv–vi, 709.

124. Prothero, Past and Present of English Farming (1912), p. 274, 371, 447.

124A. Dept. of Agriculture (1862), p. 69; also Ringwalt and Trans. Wis. Acad. Science, etc., in ref. 107.

124B. Chamber of Commerce of New York (1858), p. 131–5; Andrews, l. c. p. 411, 441–42. Patent Office (1847), p. 566; Dept. of Agric. Div. of Statistics, Miscel. Series Bul. 15, p. 45, 55–6. Prairie Farmer (1860), p. 361; (1861), p. 407; Western Farmer (vol. 1), p. 157.

124C. See ref. 106B; also Dept. of Agriculture (1862), p. 286; Div. of Statistics, l. c.; Aldrich, l. c. part 2, p. 61–3; Wright, l. c. p. 347–8; Randall, l. c. p. 42–3.

125. Price averages calculated from Aldrich Report, l. c. part 2, p. 24, 27, 60 & fol., 80, also p. 9 & 34.

125A. See appendix 6; also Randall, l. c. Fine Wool, p. 42–3; Aldrich, l. c. part 1, p. 106–731, part 2, p. 73–4; Bogart, l. c. p. 244–5.

126A. Andrews, l. c. p. 382.

127. Patent Office (1851), p. 136, 138.

127A. Dept. of Agriculture (1862), p. 600 and fol.

127B. Dept. of Agriculture (1872), p. 332; Patent Office (1854), p. 21; (1861), p. 213 and fol.; (1855), p. 29.

127C. Patent Office (1850), p. 139.

127D. Op. cit. p. 137 and fol.; see also refs. 95, 95A, 104, 108.

127E. Op. cit. (1850), p. 405; (1849), p. 16; (1851), p. 171, 149, 235, 243: (1853), p. 24; (1854), p. 20 and fol.; (1855), p. 22, 24, 28.

Country Gentleman, vol. 1, p. 133; vol. 7, p. 237, 268; vol. 21, p. 236; vol. 20, p. 111; vol. 17, p. 162, 273; vol. 24, p. 105; Cultivator (1849), p. 112, 234; Mass. Rept. (1838), p. 46 and fol.; New York Report (1843), p. 439; Cultivator (1849), p. 234.

127F. Mass. Report (1838), p. 46 and fol.

127H. Dept. of Agric. (1865), p. 456–7.

127K. Aldrich, l. c. part 2, p. 73–4; Randall, l. c. p. 42–3; Wright, l. c. p. 347–8; Mass. Rept. (1860), p. 94–95.

128. Country Gentleman (1860), p. 156, 284.

129. Cultivator, vol. 9, p. 147.

130. See Census. (1840), p. 358–9; (1860), p. 184–190.

131. Patent Office (1848), p. 368, 403–4; (1852), p. 189; (1850), p. 435; (1849), p. 242–3, 245, 112. Cultivator (1850), p. 291; (1852), p. 80. Country Gentleman, vol. 7, p. 237.

131A. Patent Office (1850), p. 139.

132. Patent Office (1849), p. 112, 242; Mass. Report (1860), p. 205, 292, 94–95, see also Cultivator (1852), p. 80; Patent Office (1852), p. 155, 170.

133. Ohio Report (1848), p. 9; Cultivator (1849), p. 157; Patent Office (1847), p. 653; Dept. of Agric. (1862), p. 262.

134. Cultivator (1849), p. 157; (1850), p. 291; Patent Office (1848), p. 409; (1850), p. 139; Dept. of Agric. (1862), p. 261–3.

135. Patent Office (1849), p. 243; Cultivator (1845), p. 117; Cultivator (1851), p. 325.

136. Dept. of Agriculture (1862), p. 262–3.

137. Patent Office (1852), p. 281; Prairie Farmer, vol. 10, p. 37.

138. Ford, l. c. p. 305 and fol., 316–17, 336–7. See also Appendix.

139. Patent Office (1854), p. 52–4; (1851), p. 137, 179, 233; (1853), p. 40; (1849), p. 127, 245; (1855), p. 52–3; Mass. Report, 1860, p. 94–5; Country Gentleman, vol. 5, p. 25; Dept. of Agriculture (1862), p. 252.

140. Patent Office (1853), p. 39; Country Gentleman, vol. 7, p. 28–9; Report on the Agriculture of Massachusetts (1837), p. 43 and fol.

141. Patent Office (1853), p. 39; Dept. of Agr. (1862), p. 282; Randall, Fine Wool, l. c. p. 104–5 and note; New York Report (1860), p. 65; Prairie Farmer (1861), p. 273; Report on the Agriculture of Massachusetts, l. c.

142. American Agriculturist, vol. 23, p. 5; Prairie Farmer, l. c.; Country Gentleman, vol. 228, p. 10.

143. Massachusetts Report (1849), p. 331; Patent Office (1850), p. 273. See also ref. 139 and 140.

144. Aldrich Report, l. c., part 1, p. 107.

145. Patent Office (1853), p. 39; (1852), p. 224; (1849), p. 127; Dept. of Agr. (1862), p. 252 and fol., 275, 279, and fol.; Farmers' Register, vol. 6, p. 267; Country Gentleman (1861), p. 396.

146. American Agric., vol. 22, p. 365.

147. Ohio Report (1849), p. 47, 106; Patent Office (1850), p. 200, 280; (1852), p. 265; (1854), p. 53; Ohio Report (1855), p. 175; (1860), p. 4; Dept. of Agriculture (1862), p. 280; Randall, Fine Wool, l. c. p. 101 and fol.

148. Randall, Fine Wool, l. c. p. 55, 73, and fol.; 80, 88, 99; Sheep Husbandry, l. c. p. 160 and fol.; Cultivator, vol. 2, p. 220; vol. 3, p. 252.

149. B. A. I., l. c. p. 484, 503–5, 515, and fol., 518; Dept. of Agriculture, (1863). p. 232; (1871), p. 190–91; Randall, Sheep Husbandry, l. c. p. 160–61; Cultivator (1851), p. 324; Dept. of Agriculture (1864), p. 506.

150. Randall, Practical Shepherd, l. c. p. 28 and fol.; Patent Office (1849), p. 256; Prairie Farmer (1861), p. 152; see ref. number 148; Dep. of Agriculture (1864), p. 507; (1866), p. 344.

151. Randall, Fine Wool, l. c. p. 55–6; 88–94, 99–100, and letter in Country Gentleman, vol, 26, p. 204; Dept. of Agric., 1866, p. 344–345.

152. Randall, l. c. p. 59–61; Practical Shepherd, l. c. p. 38 and fol.

153. Randall, Sheep Husbandry, l. c. p. 289 and fol.; Patent Office (1847), p. 364; (1849), p. 242, 246, and fol., 251, 257; Prairie Farmer, vol. 2, p. 334; vol. 7, p. 301; Cultivator, vol. 4, p. 231; Country Gentleman, vol. 2, p. 173.

154. Patent Office (1849), p. 257; Prairie Farmer, vol. 10, p. 161, 165, 193.

155. See Appendix.

156. Op. Cit.: Aldrich Report, l. c., Part 1, p. 106–7.

156A. Dept. of Agriculture (1862), p. 286, 300.

157. Dept. of Agriculture (1862, p. 256–258; (1864) p. 242, 508–9; (1871) p. 38.

158. Op. cit. (1866), table, p. 67.

159. Census 1900, vol. 5, p. ccxiii, 708. See also Appendix.

160. Dept. of Agriculture (1862), p. 300 and fol.; Prairie Farmer, vol. 18, p. 214, 265, 331; vol. 19, p. 379; Country Gentleman, vol. 24, p. 385; American Agriculturist, vol. 23, p. 233–4; Dept. of Agriculture (1871), p. 40; Special Report, l. c. p. XL–XLI; Dept. of Agriculture (1866), p. 342; (1862) p. 252.

161. Country Gentleman, vol. 21, p. 236; vol. 24, p. 106.

162. Dept. of Agriculture (1864), p. 178–9; (1862) p. 301.

163. Country Gentleman, vol. 20, p. 111; Prairie Farmer (1867), p. 379, 182; (1863) p. 309; Dept. of Agriculture (1862), p. 301–303 and fol.; see also earlier references on cost of keeping sheep and the movement to the West.

163A. Dept. of Agric. (1862), p. 287; Ia. Agric. Soc. (1860), p. 280.

164. Country Gentleman, vol. 21, p. 145, 177; vol. 22, p. 257; vol. 24, p. 385; vol. 25, p. 268; vol. 29, p. 84; Prairie Farmer, vol. 13, p. 266, 296–7; American Agriculturist, vol. 23, p. 330; vol. 24, p. 43; Dept. of Agriculture (1865), p. 484–5; Prairie Farmer (1864), p. 84, 322.

164A. Prairie Farmer, vol. 18, p. 111.

165. American Agriculturist, vol. 24, p. 43.

166. Op. cit., vol. 22, p. 330.

167. Country Gentleman, vol. 19, p. 348.

168. Dept. of Agriculture (1863), p. 28–9; American Agriculturist, vol. 22, p. 332; New England Farmer (1863), p. 347.

168A. J. R. Dodge, Sheep and Wool (Dept. of Aric. Report 66, 1900), p. 23; Bull. 94, Dept. of Agric. (1914), Domestic Breeds of Sheep, p. 87–8.

169. Country Gentleman, vol. 24, p. 385.

170. Randall, Fine Wool, l. c. p. 87 and fol., 90 and fol., also p. 98 and fol.; Dept. of Agriculture (1866), p. 344–5; (1864) p. 507; Country Gentleman, Vol. 26, p. 204.

171. Prairie Farmer (1866), p. 147; Dept. of Agriculture (1864), p. 507; Country Gentleman, l. c.

171A. Dept. of Agriculture (1866), p. 345–6; also ref. 151 here, and Country Gentleman, l. c.

172. American Agriculturist, vol. 24, p. 43; Randall, Practical Shepherd, l. c. p. 81; Country Gentleman, vol. 26, p. 204.

173. Prairie Farmer (1862), p. 372; B. A. I., l. c. p. 950, 953; Country Gentleman, vol. 15, p. 48, 80; vol. 17, p. 113.

174. Aldrich Report, l. c., Part 1, p. 106–7.

174A. B. A. I., l. c. p. 55.

175. Dept. of Agriculture (1862), p. 254; (1866), p. 348; Randall, Fine Wool, l. c. p. 102.

176. Dept. of Agriculture (1862), p. 242.

177. Dept. of Agriculture (1862), p. 323–4, 279 and fol., 281, 258.

177A. Op. cit. (1862), p. 323.

178. Op. cit., p. 254–6, 293, 258 (1866), p. 341 and fol., 349 and fol.; Prairie Farmer (1866), p. 214, 265; Country Gentleman, vol. 27, p. 141; vol. 30, p. 241, 205; vol. 22, p. 10; Prairie Farmer (1861), p. 207; Dept. of Agr. (1865), p. 479–80; (1864), p. 245.

178A. Dept. of Agriculture (1869), p. 381 and fol.

179. Dept. of Agriculture (1871), p. 196–7; American Agriculturist, vol. 22, p. 234.

180. Dept. of Agriculture (1864), p. 508–9.

181. Country Gentleman, vol. 15, p. 48, 80; vol. 22, p. 257; vol. 24, p. 289; American Agriculturist, vol. 22, p. 283, 299.

182. Country Gentleman, vol. 19, p. 253; vol. 27, p. 141; Dept. of Agriculture (1862), p. 256.

182A. Dept. of Agriculture (1865), p. 482.

183. Dept. of Agriculture (1871), p. 39 and table, p. 40; see also Wright, l. c. p. 176 and note.

184. Ford, l. c. p. 305 and fol., 317, 337.

185. Dept. of Agriculture (1867), p. 119 and fol.; (1866), p. 90; (1871), p. 41; Ford, l. c.

186. Dept. of Agriculture (1867), p. 119; (1871), p. 40–42.

187. Op. cit., both vols.; see also Wright, l. c. p. 160 & fol., table, p. 338–9.

188. Dept. of Agriculture (1871), p. 40–41; Country Gentleman, vol. 30, p. 330, 173; Prairie Farmer, vol. 19, p. 200; see also Country Gentleman, vol. 34, p. 14; Dept. of Agriculture (1869), p. 378.

189. Dept. of Agriculture (1866), p. 67; (1870), p. 48.

190. Prairie Farmer, vol. 41, p. 1.

191. Aldrich Report, l. c. p. 106–7 (currency prices).

192. See Appendix (currency prices).

193. Country Gentleman, vol. 30, p. 93; Prairie Farmer, vol. 40, p. 178; vol. 41, p. 1, 50; Dept. of Agr. (1869), p. 381; (1871), p. 34, 40; (1868), p. 524.

194. Country Gentleman, vol. 30, p. 93.

195. Country Gentleman, vol. 30, p. 404.

196. Dept. of Agriculture (1866), p. 76; (1867), p. 98; (1868), p. 41; (1869), p. 42; (1870), p. 44; (1871), p. 34, 40–41; Prairie Farmer, vol. 19, p. 379; Country Gentleman, vol. 33, p. 517.

197. See Prairie Farmer, vol. 18, p. 347–8, 331–2.

198. Country Gentleman, vol. 30, p. 396.

199. Prairie Farmer, vol. 40, p. 40.

199A. Bulletin, N. A. W. M., vol. 2, p. 463, 466.

199B. Dept. of Agriculture (1871), p. 34.

200. Country Gentleman, vol. 33, p. 374.

201. Dept. of Agriculture (1870), p. 48; Census (1900), vol. 5, p. 708. See also Appendix II.

202. Census 1880, vol. 3, p. 1025, 1058–9, 1063, 1071–2.

203. Patent Office (1853), p. 46.

204. B. A. I., l. c. p. 18 and fol.

205. Brockett, Our Western Empire (1881), p. 181; B. A. I., l. c. p. 947.

206. Census 1880, vol. 3, p 1035–6 and note; Brockett, l. c.; B. A. I., l. c. p. 948 and fol., 919, 921, 923, 914, 917–8.

207. Brockett, l. c., B. A. I., p. 914.

208. Country Gentleman (1859), p. 288; vol. 35, p. 457; vol. 27, p. 267; Prairie Farmer (1861), p. 226; Dept. of Agriculture (1866), p. 599; (1864), p. 478–9; Brockett, l. c. p. 608–9; B. A. I., l. c. p. 950. Copious references have already been given dealing with the introduction of Merino and mutton animals into California.

209. Census (1880), vol. 3, p. 1036.

210. B. A. I., l. c. p. 954.

210A. Bancroft, H. H., History of the Northwest Coast, vol. 1, p. 443; vol. 2, pp. 442, 443.

211. Op. cit., p. 976 and fol., 948; Census, l. c. p. 1084.

212. B. A. I., l. c. p. 977.

213. Op. cit., p. 979–80.

214. Census, l. c. p. 1027, 1036; Brockett, l. c. p. 991–2; B. A. I., c. l. p. 706 and fol. See also p. 10, Thesis of J. S. Cotton (1904), presented to the Washington State Agric. College.

215. Census, l. c. p. 1053, 1056; B. A. I., l. c. p. 935, 941.

216. Op. cit., l. c. p. 954–5; Brockett, p. 425.

217. Brockett, l. c. p. 1139.

218. Country Gentleman, vol. 13, p. 284; vol. 29, p. 12; vol. 15, p. 156, 284; vol. 31, p. 262.

219. Country Gentleman, vol. 15, p. 284.

220. Op. cit., vol. 31, p. 262. See also ref. 121.

221. Op. cit., vol. 13, p. 284; vol. 29, p. 12.

222. B. A. I., l. c. p. 897, 899, 902, 905, 908–9.

223. Op. cit., p. 788–9; Brockett, l. c. p. 712–13; Census (1880), vol. 3, p. 1006.

224. Op. cit., p. 1071, 1072; Brockett, p. 1174–5; B. A. I., p. 805.

225. Wool and Manufacture of Wool, Report of the Tariff Board on Schedule K (1912), p. 302. Hereafter referred to as Schedule K.

225A. Census, 1880, vol. 3, p. 991.

226. Brockett, l. c. p. 182.

227. Dept. of Agriculture (1884), p. 445; (1892), p. 443; (1896), pp. 576–7; Census (1900), vol. 5, p. 708.

228. Ford, l. c. p. 42.

228A. Census (1880), vol. 3, p. 1007.

229. See table in Wright, l. c. p. 339; Bulletin. N. A. W. M., vol. 15, p. 274–5.

230. For above cited increases and decreases based on Census figures see Census (1900), vol. 5, p. 708; (1910), vol. 5, p. 394 and fol. 402–3. See also Appendix which summarizes these data by States.

230A. Op. cit.

231. See ref. 227.

232. See ref. 230.

233. Dept. of Agriculture (1911, 1912, 1913, 1914, 1915), see index for number of sheep by States.

234. Dept. of Agriculture (1893), p. 552; (1914), p. 634; Bulletin, N. A. W. M., vol. 46, No. 1, p. 12; figure for 1894 from Wright, l. c. p. 336; The Department accepted the estimates of the National Association of Woolen Manufacturers after 1894; Wright, l. c. p. 338–9.

235. Op. cit.

235A. Dr. S. W. McClure in the Country Gentleman, May 13, 1916, p. 1016. See also Bulletin N. A. W. M., vols. 40–47, Annual Wool Review.

236. Dept. of Agriculture (1914), p. 634; (1915), p. 532.

237. Census (1910), vol. 5, p. 496.

238. Dept. of Agriculture (1915), p. 532, 534–5; (1914), p. 634.

238A. Op. cit. (1914), p. 634; (1915), p. 532.

239. Census (1910), vol. 5, p. 493; (1900), vol. 5, p. CCXV–VI. See also Appendix for estimated annual gain in clip per sheep by States.

240. See Appendix.

241. Special Report, l. c. p. XLIII.

241A. Country Gentleman, vol. 59 (1894), p. 313, 821; vol. 60 (1895), p. 332; vol. 61 (1896), p. 806; American Agriculturist, vol. 53 (1894), p. 228, 256.

241B. Bulletin, N. A. W. M., vol. 20, p. 148–51; vol. 13, p. 236–8; vol. 15, p. 272 and fol.

241C. See Appendix.

242. Dept. of Agriculture (1892), p. 443; (1896), p. 576–7.

242A. Country Gentleman, vol. 61, p. 806 (1896).

243. Census (1900), vol. 5, p. 708.

244. Census (1910), vol. 5, p. 402–3.

245A. Dept. of Agriculture (1915), p. 412, 421, 432, 519, 535; Bull. 75, Bureau of Statistics, Dept. of Agriculture, p. 10–13, 28–30; Census (1910), vol. 5, p. 389; (1900), vol. 5, p. CCXX–XXI.

246. Aldrich Report, l. c. p. 106–7; Bureau of Labor Statistics, Bull. 181 (1915), p. 111 and fol. 266.

246A. Farmers' Bulletin 652 (1915), p. 6.

246B. See Appendix, wool prices.

246C. Chart Bull. N. A. W. M., Jan., 1917, for an excellent presentation of the war's effect on wool prices.

246D. Bull. 15 (Revised, 1901), Div. of Statistics, U. S. Dept. of Agriculture, p 14–16, 21 and fol., 45 and fol., 55 and fol.

247. Ford, l. c. p. 19; Special Report, l. c. p. XLI. Breeders' Gazette, Dec. 30, 1915, p. 1245.

247A Country Gentleman, vol. 59 (1894), p. 821; vol. 60 (1895), p. 332; vol. 61 (1896), p. 806. Farmers' Bull. 117, U. S. Dept. Agric. (1900), p. 9; J. R. Dodge, Sheep and Wool, p. 21 (Report No. 66, U. S. Dept. of Agriculture, 1900). B. A. I., l. c. p. 712–13. 725–6, 760, 772–3, 787–8, 790–91, 800–01.

248. Special Report, l. c. p. XVII, XXV, XLI–XLII, LIII. Dept. of Agriculture (1871), p. 196–7; B. A. I., l. c. p. 500–1, 505, 508 and fol., 511 and fol.; Bulletin, N. A. W M, vol. 3, p. 265–7; vol. 10, p. 328–9; vol. 16, p. 101.

249. The National Wool Grower (April, 1916), p. 28.

249A. Dept. of Agriculture (1876), p. 427; (1869), p. 381; Bulletin, N. A. W. M., vol. 2, p. 469–70.

249B. American Agriculturist, vol. 56 (1895), p. 578; Country Gentleman, vol 58 (1893), p. 212, 452; vol. 59, p. 332. B. A. I., l. c. p. 859, 667, 672, 675, 679, 825, 831, 839.

249C. B, A. I., l. c. p. 774, 778, 782–3, 791, 803, 806–7, 817–8, 822, 837–8, 846, 851, 879. Census Report, 1880, vol. 3, Special Report on Cattle, Sheep, and Swine, p. 64, 57.

250. Census (1900), vol. 5, p. CCXIII–IV. Breeders' Gazette, Dec. 30, 1915, p. 1245.

251. Schedule K, p. 552, 568, 559.

252. Dept. of Agriculture (1914), p. 424; Census (1900), vol. 5, p. CCIII.

253. Schedule K, p. 300.

254. Op. cit, p 348.

255. Op. cit., p 300.

256. Statement of Dr. S. W. McClure, Secy. Natl Assn. of Wool Growers, and concurred in by others.

257. Op. cit.

258. The national wool grower.

259. Dept. of Agriculture (1915), p. 533–4; Bulletin Natl. Assn. Wool Manufacturers, Jan., 1916, p. 5–6; Jan., 1914, p. 2, 4, 5–7.

260. Statement of Dr. McClure.

261. National Wool Grower, l. c., p. 27, New Zealand Official Yearbook (1914), p. 600; Bulletin, N. A. W. M., l. c., vol. 46, No. 1, p. 54; Dept. of Agriculture (1914), p. 381; Annual Wool Review (1914), N. A. W. M., p. 8; Schedule K, p. 347.

261A. F. R. Marshall: Address, Second Pan-American Scientific Congress, Wash., D. C., Dec.–Jan., 1916.

262. Schedule K, p. 347. Breeders Gazette, Dec. 30, 1915, p. 1245–6.

263. The National Wool Grower, l. c., April, 1916, p. 28; also statement of persons well versed in range conditions.

263A. Marshall, l. c.: Also Marshall in the journal of Heredity, vol. 7, no. 2, p. 88 and fol.

263B. Bulletin N. A. W. M., vol. 46, no. 1, p. 33; Annual Wool Review, N. A. W. M. (1914), p. 8.

263C. Marshall, address, l. c.

263D. Rept. 109, Office of the Secy. Dept. of Agric. (1916), p. 45 and fol.

264. Schedule K, p. 545 and fol.; 553 and fol.; 568 and fol.

264A. Report 110, Office of the Secy. Dept. of Agric. (1916), Part II, p. 44 and fol.

265. Schedule K, p. 556.

266. Bulletin, N. A. W. M., April, 1916, p. 27.

267. Dept. of Agriculture (1915), p. 530; Price Current Grain-Reporter, Statistical Annual (1915), p. 61.

268. Data secured by correspondence with the various live-stock markets.

269. Dept. of Agriculture (1915), p. 538, 529.

270. See Yearbooks, Chicago Daily Farmers and Drovers Journal (1914), p. 69; (1915) p. 69; (1916) p. 69.

271. Dept. of Agriculture (1915), p. 538.

271A. Marshall, Address, l. c.

272. Prairie Farmer (1861), p. 199.

272A. Farmers Bulletin 652, l. c., p. 6.

272B. Bulletin, N. A. W. M., Jan, 1916, p. 12.

272C. Report 110, Office of the Secy., l. c., Part 2, p. 6 and fol.

273. Schedule K, p. 302.

274. Craig, Sheep Farming (1913), p. 11, and statement of Mr. Geo. Willingmyre, formerly wool specialist for the Canadian Government.

EXPLANATION OF MAPS.

These maps were kindly loaned for use in this essay by the Office of Farm Management, United States Department of Agriculture, where they were prepared.

MAP 1. In 1840 there were 19,311,000 sheep in the United States. They were concentrated largely in New York and New England, which States contained 46 per cent of the total. New York and Vermont alone contained 35 per cent. Elsewhere in the East sheep were no more numerous than in the settled sections west of the Alleghenies. The dependence of the eastern woolen mills on the flocks of the East had resulted in a concentration of sheep in the sections where soil, climate, topography, and transportation facilities were deemed most favorable for woolgrowing. West of the Alleghenies sheep had increased at about the same rate as the local demand for wool, and western wool had not yet invaded the eastern markets to an appreciable extent. A good start had been

made by the Ohio district, however, toward its later dominance in the sheep industry.

MAP 2. In 1850, 21,723,000 sheep were reported by the census. Of these New York and New England contained only 26 per cent, a striking decline having occurred during the decade as a result of competition with cheaper wool from the greatly enlarged flocks of the West, and with more profitable farm enterprises, particularly dairying. Elsewhere in the North Atlantic section the decline had been less marked because there had been fewer sheep to lose. West of the Alleghenies, in central and eastern Ohio, western Pennsylvania, the Panhandle of Virginia, and in southern Michigan, rapid gains had been made, particularly in Ohio. The North Central States (Ohio, Indiana, Illinois, Michigan, and Wisconsin), with Kentucky and Tennessee, contained 40 per cent of the national total, and sheep were rapidly becoming prominent in the prairie States.

MAP 3. In 1860 the census reported 22,471,000 sheep, which a subsequent revision raised to 23,977,000 head. Of these only 19 per cent were in New York and New England, where the earlier decline had continued, and for the same reasons. Sheep in Ohio, Indiana, and Illinois had also declined slightly in numbers, due to competition of other enterprises with sheep as a result of high prices and improved transportation facilities. The North Central States as a whole had gained slightly with increased settlement, but the percentage of the national total in these States, together with Kentucky and Tennessee, had fallen slightly, due to more rapid growth of the sheep industry in newer regions. Sheep had increased rapidly in Texas, New Mexico, and California, where the foundations were being laid for the later dominance of the industry in the Far West.

MAP 4. The census of 1870 reported 28,476,000 sheep. As a result of many factors, not the least of which was the high price of wool, the North Central States had made a large gain in number of sheep, and in spite of a pronounced increase elsewhere in the West contained 39 per cent of the national total. Texas shows a pronounced decline in number of sheep, largely the result of war-time losses, but California had progressed rapidly, and the Far West as a whole (the Pacific and Rocky Mountain States and Texas) contained one-sixth of all the sheep. East of the Alleghenies the earlier decline had continued. New York and New England now contained less than 13 per cent of the national total.

MAP 5. The effect of improved transportation facilities in the far West following the opening of the first transcontinental railroad in 1869 are plainly evident in 1880. The far West then contained 45 per cent of the 42,192,000 sheep in the country. They were still concentrated largely in the Pacific Coast States, New Mexico, and Texas; but the industry had also spread throughout the Mountain region (Rocky Mountain States, Nevada, and Arizona) to a considerable extent. Sheep had also increased in the Central West as a whole (the Dakotas, Minnesota, Iowa, Missouri, Nebraska, and Kansas). Pronounced gains in Wisconsin and Michigan had resulted in only a small loss in the North Central States. The industry in Ohio had been practically stationary. Factors previously noted had caused a further decline in the North Atlantic region.

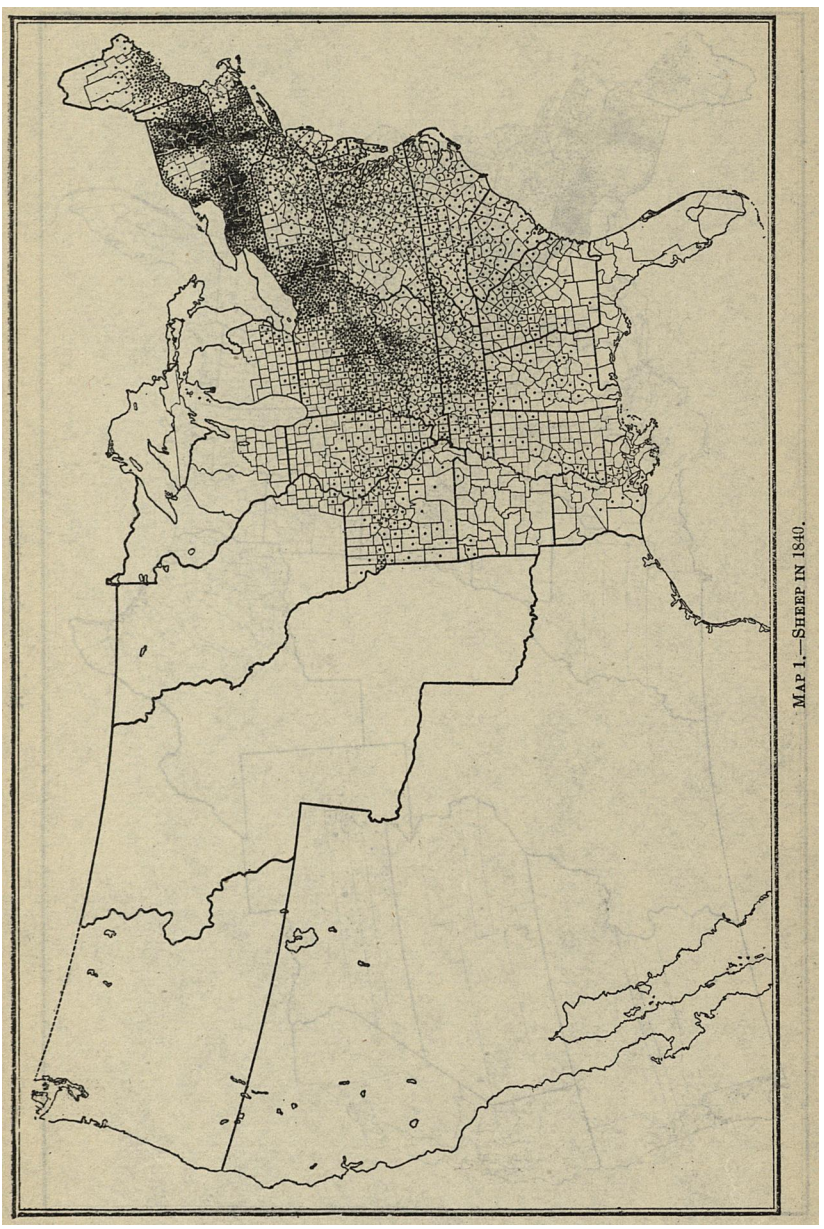
MAP 6. By 1890, after the first rush of expansion, the sheep industry had slowed up in the far West and was beginning to concentrate in the Mountain region following a pronounced decline in California. Texas and Oregon had also increased their flocks considerably. A slight decline in the Central West and a larger loss in the North Central section was the result of continued

pressure from factors previously mentioned. At this time the country contained 40,876,000 sheep, of which 6 per cent were in New York and New England, 23 per cent in the North Central States, and 47 per cent in the Far West. Half of the latter were in the Mountain States.

MAP 7. Striking changes had taken place by 1900. Low prices and continued agricultural settlement had caused a pronounced decline in Texas and California, and the sheep industry was finally concentrated in the mountain and plateau regions of the far West. The Mountain States contained 45 per cent of the 39,853,000 adult sheep in the country. In the plains region there was a considerable gain due to an adoption of the sheep industry in the newer-settled areas. The North Central States showed a striking decline. This is particularly evident in Michigan and Ohio, the former strongholds of the industry. East of the Alleghenies the decline had also been very rapid.

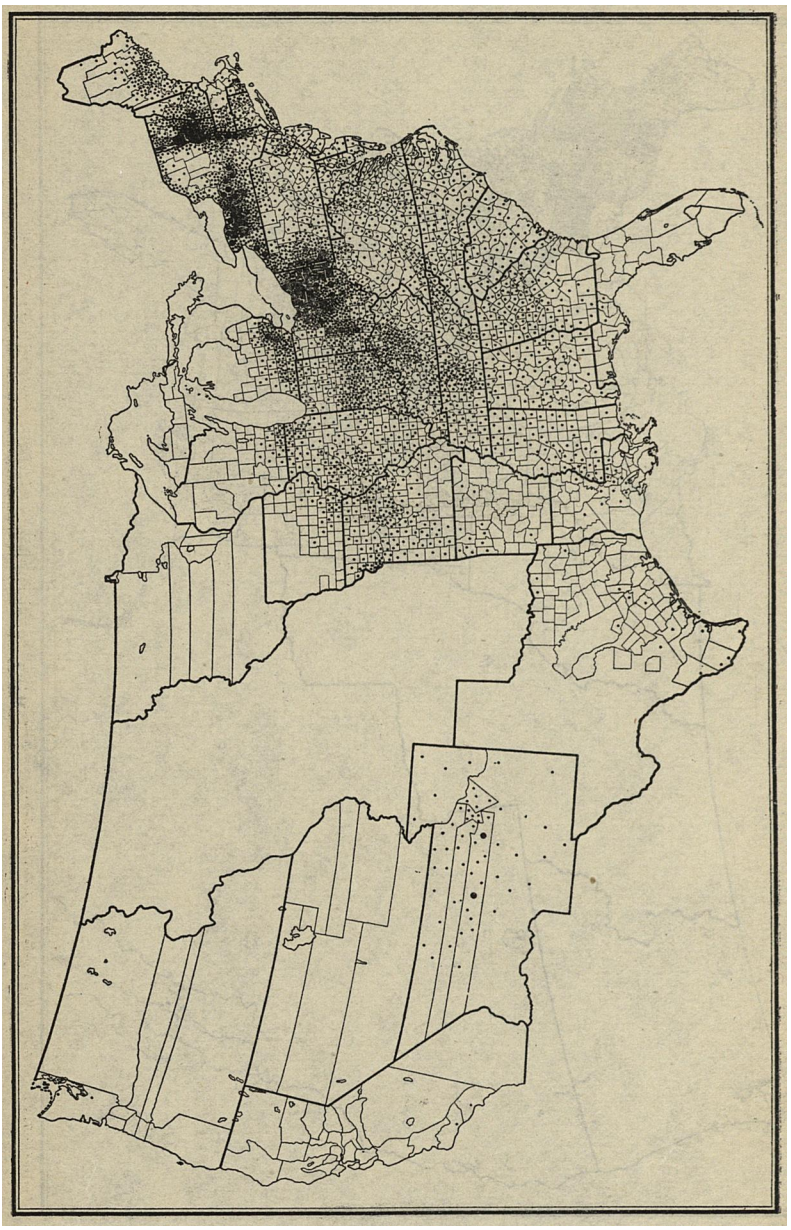
MAP 8. In 1910 the Mountain States contained 49 per cent of the national total of 39,644,000 adult sheep. The industry in the far West had continued to concentrate in the Mountain States, though much more slowly than during the nineties. With a few exceptions the sheep industry east of the Rocky Mountains had continued to decline. These maps show in a striking manner the westward shift of the sheep industry to areas of cheap land. Wool sheep had in general moved with the frontier, and the great bulk of the sheep left in most of the farming States were mutton types. Mutton sheep are well adapted to farm conditions, while wool sheep for over one-third of a century have been raised principally on the range.

MAP 9. The number of sheep in 1915, based on the estimates of the Department of Agriculture, also includes lambs on hand in December, and for that reason is not numerically comparable with the census figures for number of adult sheep used in the other maps. The importance of the industry in the different regions, however, is accurately shown. Since 1910 there has been a net increase in number of sheep east of the Rocky Mountain States, the principal gains being in the corn belt, Texas, Tennessee, Kentucky, and the Virginias. The North Atlantic States show a continued decline. Striking declines are reported for the mountain region, where the estimated loss in number of sheep is put at over seven and one-third million head. It is believed that, so far as concerns the fundamental stability of the industry, this decline is more apparant than real, due to the growing tendency on the range to eliminate wethers from the flocks and to market the lambs as early in the fall as possible. As a result, a steadily diminishing proportion of the lambs are now included in the estimates.

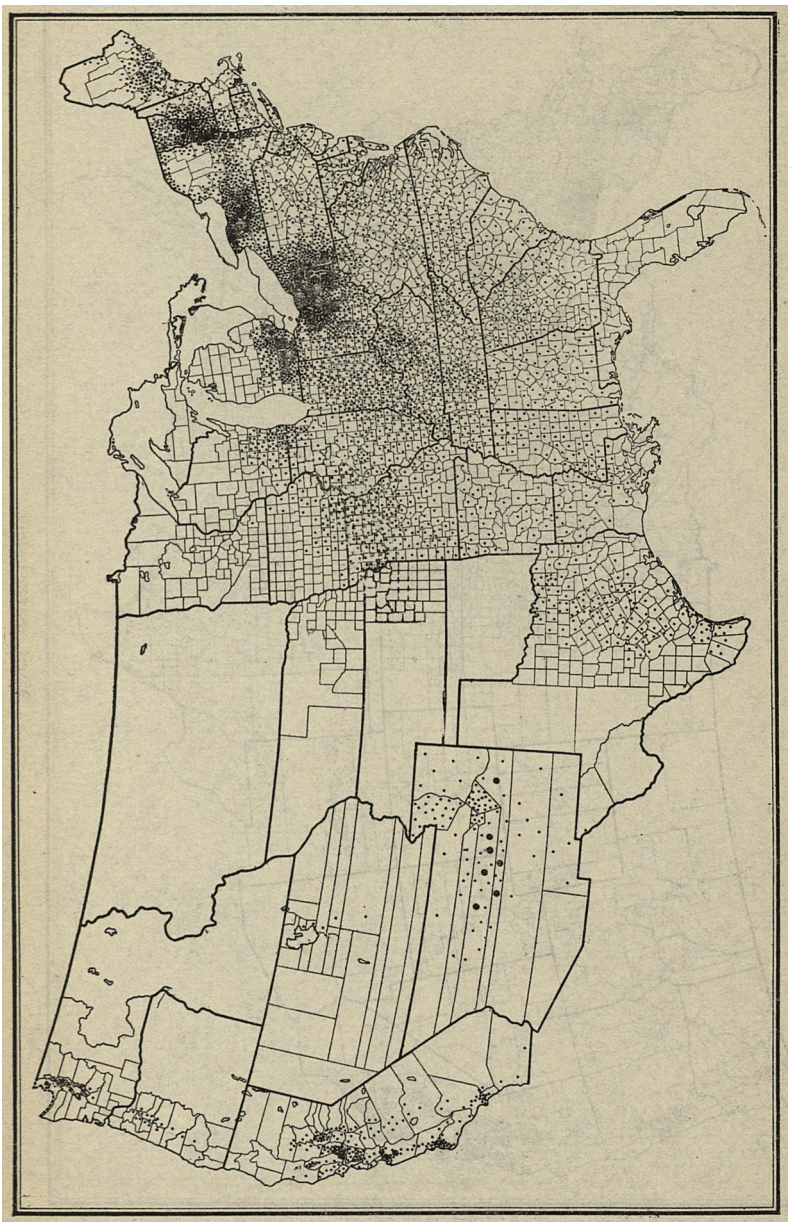


MAP 1.—SHEEP IN 1840.

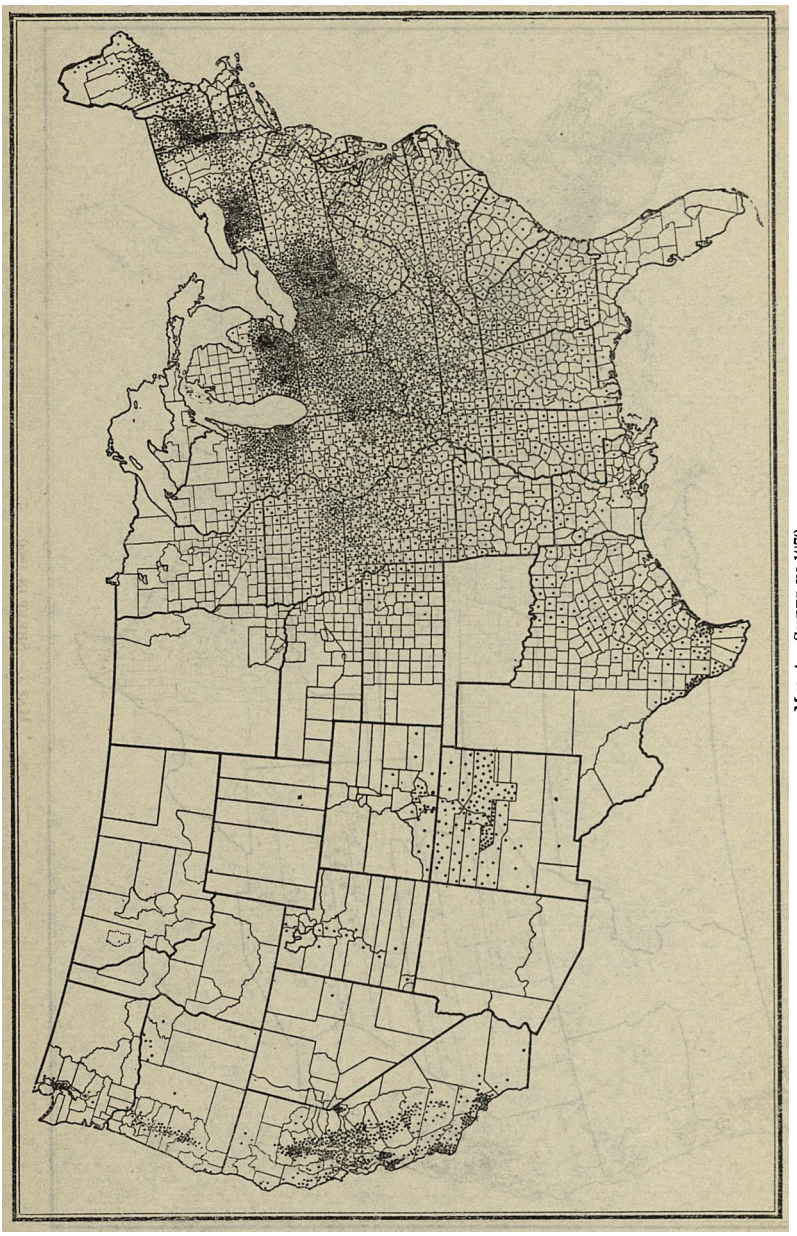
35360—21——7



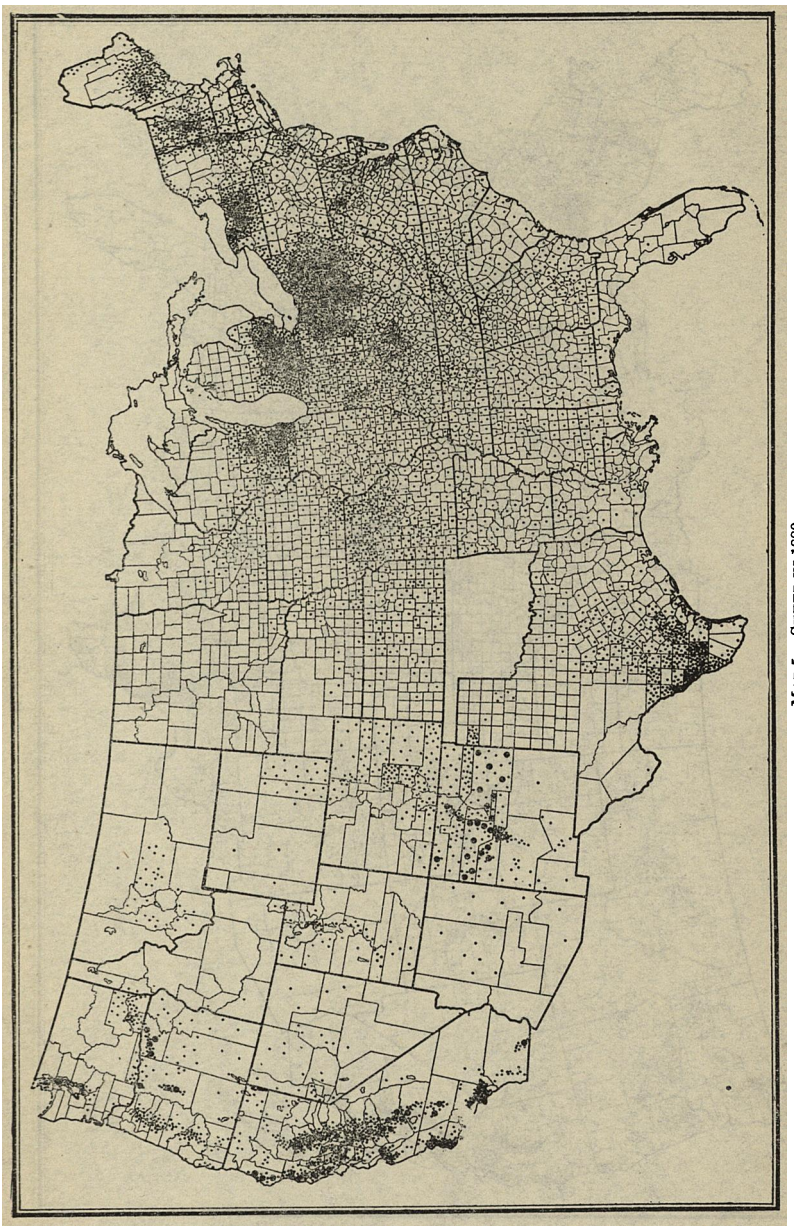
MAP 2.—SHEEP IN 1850.



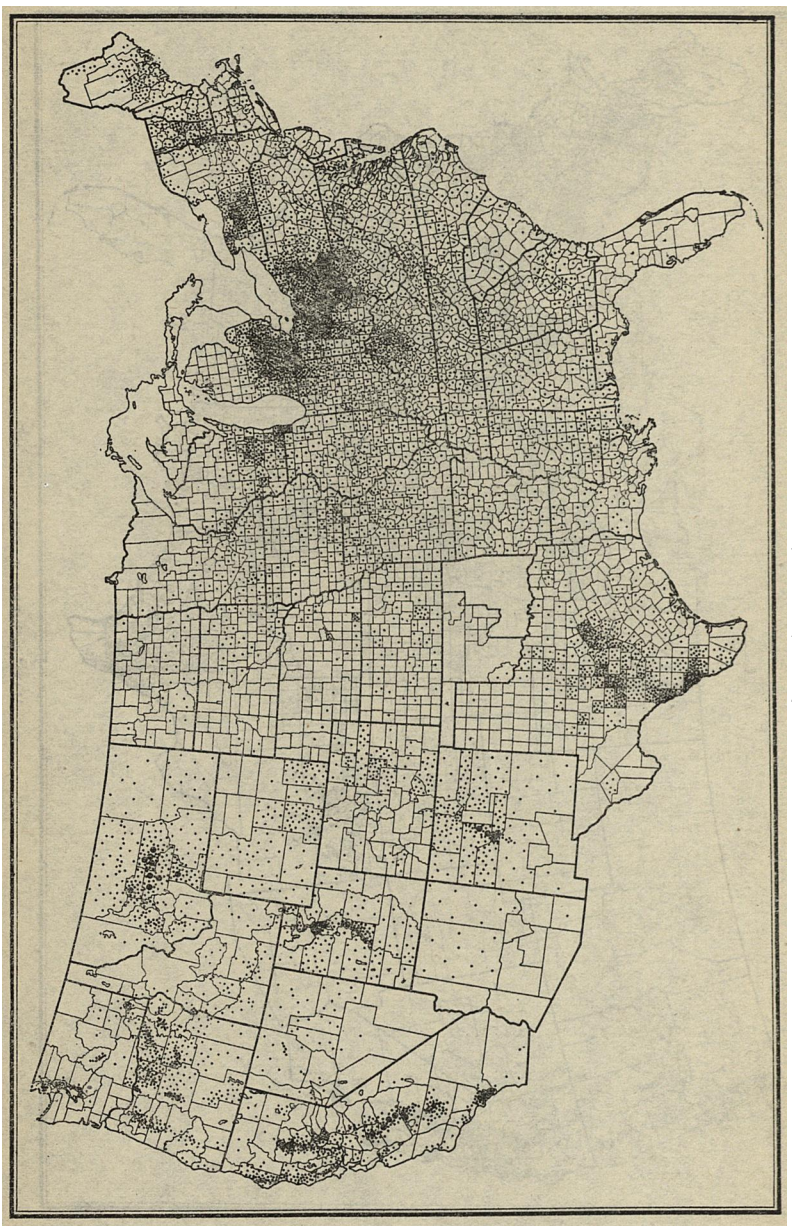
MAP 3.—SHEEP IN 1860.



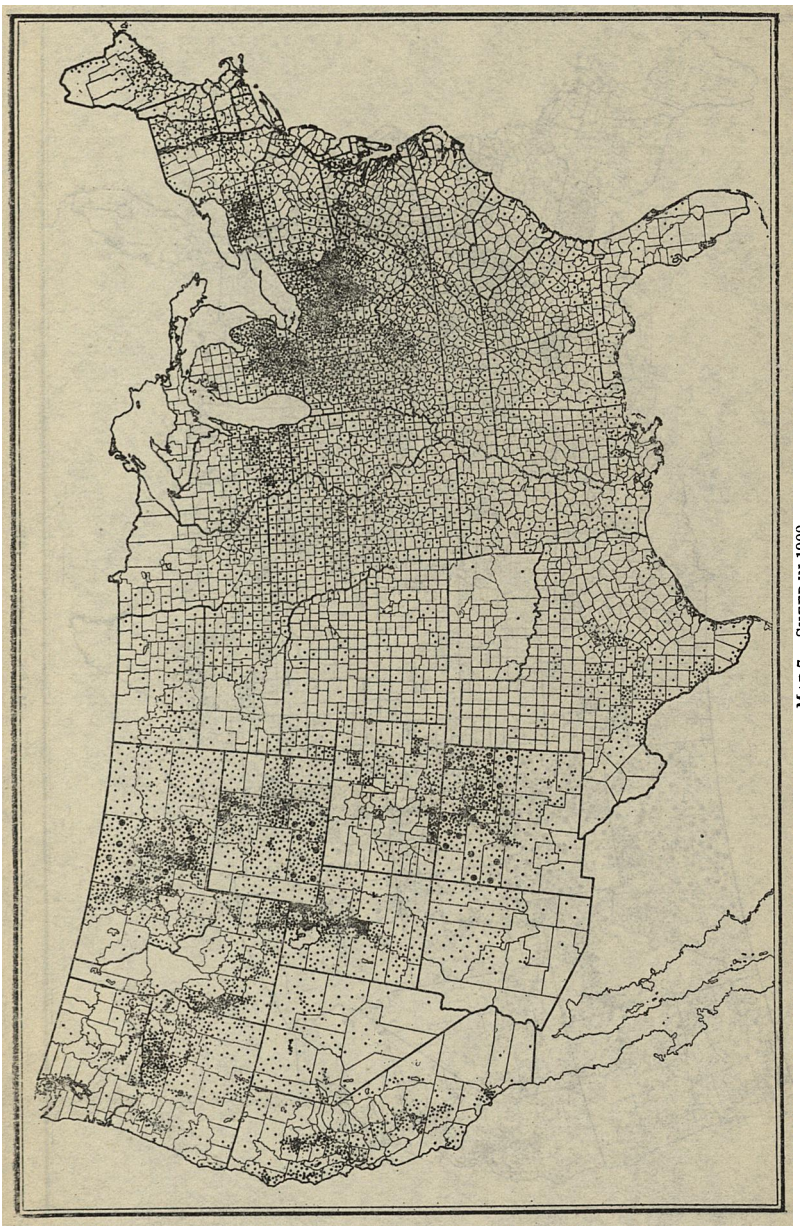
MAP 4.—SHEEP IN 1870.



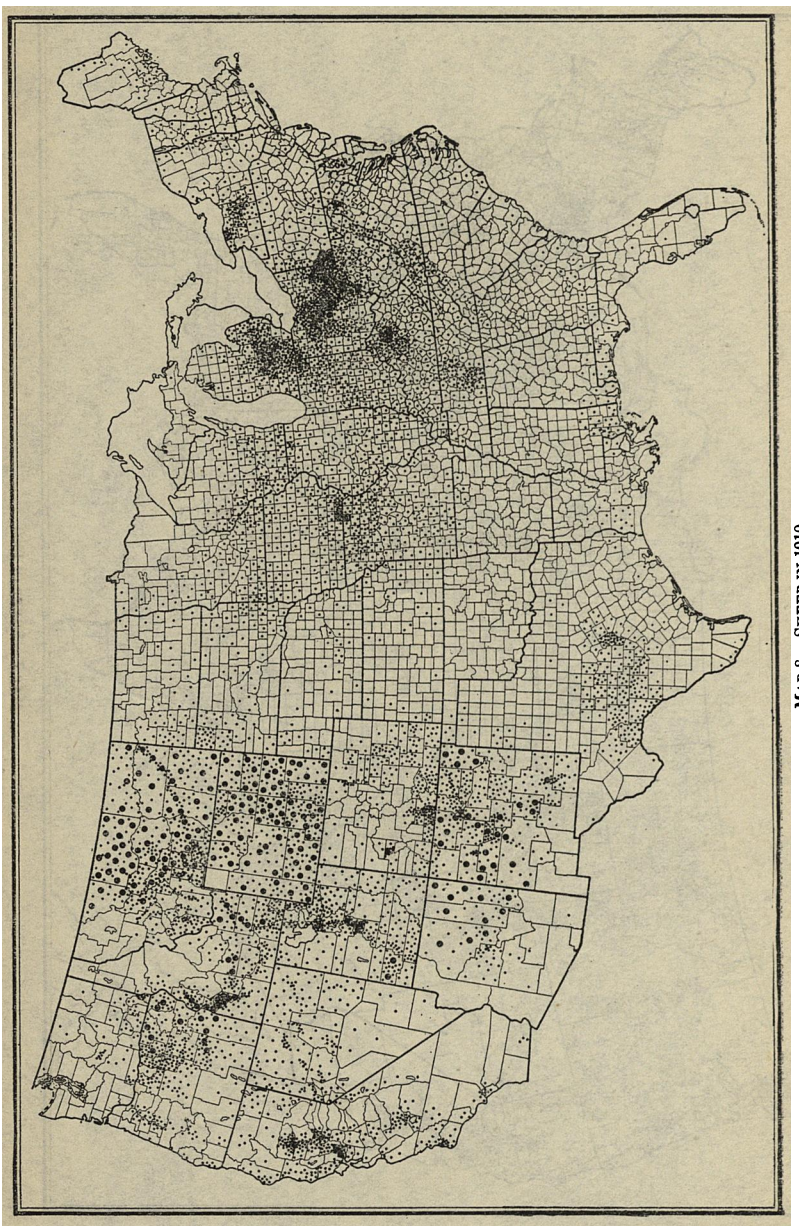
MAP 5.—SHEEP IN 1880.



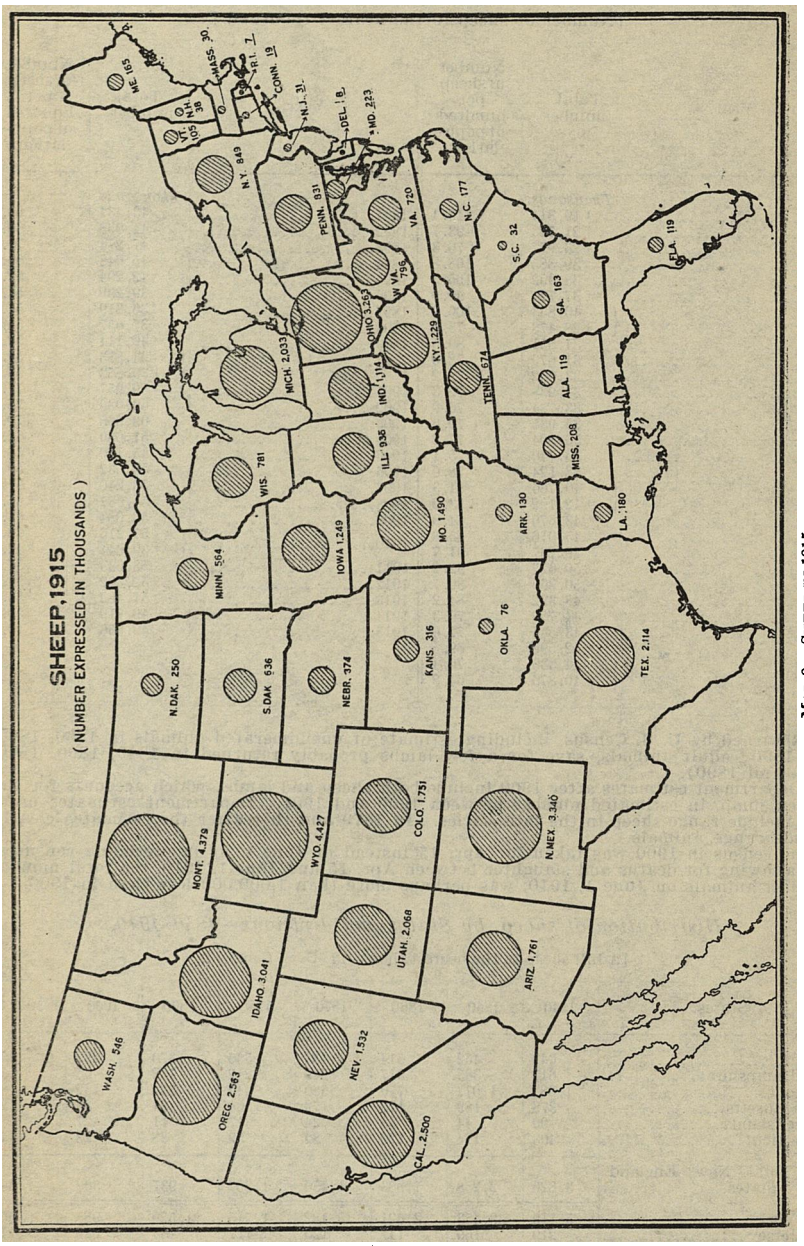
MAP 6.—SHEEP IN 1890.



MAP 7.—SHEEP IN 1900.



MAP 8.—SHEEP IN 1910.



MAP 9.—SHEEP IN 1915.

TABLES.

Sheep in the United States; United States Census and Estimates of Department of Agriculture.

[Number of sheep to the nearest thousand.]

Year.	Total number.	Number of sheep per hundred of population.	Year.	Total number.	Number of sheep per hundred of population.
	Thousands.			*Thousands.*	
1840	[1] 19,311	[1] 113.1	1891	43,431	68.0
1850	[1] 21,723	[1] 93.7	1892	44,938	69.0
1860	[1] 23,977	[1] 76.3	1893	47,274	71.3
1867	39,385	108.8	1894	45,048	66.6
1868	38,992	105.5	1895	42,294	61.4
1869	37,724	99.9	1896	39,299	54.5
1870	40,853	106.0	1897	36,819	51.4
	[1] 28,478	[1] 73.9	1898	37,657	51.6
1871	31,851	80.5	1899	39,114	52.6
1872	31,679	78.0	1900	41,883	55.1
1873	33,002	79.2		[1] 39,853	[1] 52.4
1874	33,938	79.3	1901	[2] 59,957	77.0
1875	33,784	76.9	1902	62,039	78.3
1876	35,935	79.6	1903	63,965	79.1
1877	35,804	77.2	1904	51,630	62.6
1878	35,740	75.1	1905	45,170	53.7
1879	38,124	78.0	1906	50,632	59.1
1880	40,766	81.3	1907	53,240	61.0
	[1] 42,192	[1] 83.9	1908	54,631	61.5
1881	43,570	84.9	1909	56,084	61.9
1882	45,016	85.8	1910	57,216	62.0
1883	49,237	91.7		[1] 39,644	[1] 42.9
1884	50,627	92.2	1911	53,633	57.1
1885	50,360	89.7	1912	52,362	54.9
1886	48,322	84.2	1913	51,482	53.0
1887	44,759	76.3	1914	49,719	50.3
1888	43,545	72.6	1915	49,956	49.8
1889	42,599	69.5			
1890	44,336	70.4			
	[1] 40,876	[1] 64.9			

[1] Returned by U. S. Census, including estimate of unenumerated animals in 1860, 1880, and 1890 (adult animals, save for a few lambs probably returned in 1840, 1860, 1870, 1880, and 1890).

[2] Department estimates after 1900 include both sheep and lambs, which accounts for the sudden jump, in estimated number between 1900 and 1901. Department estimates probably include range sheep in the late sixties. In 1879 and thereafter the estimates clearly include range animals.

The census in 1900 was taken for Apr. 15 instead of June 1, as in preceding censuses, and allowing for deaths and slaughter between Apr. 15 and June 1, 1910, the total number of adult animals on June 1, 1910, was perhaps more than 1,000,000 less than in 1900.

Distribution of sheep, by States and divisions—1840–1910.

[Adult sheep to the nearest thousand, U. S. Census.]

States.	1840	1850	1860	1870	1880	1890	1900	1910
Maine	649	452	514	435	566	370	252	150
New Hampshire	617	385	317	249	212	132	65	31
Vermont	1,682	1,014	770	580	440	334	182	84
Massachusetts	378	189	123	79	68	51	34	23
Rhode Island	90	44	38	24	17	11	7	4
Connecticut	403	174	120	84	59	38	23	14
Total New England States	3,820	2,258	1,883	1,450	1,362	937	563	306
New York	5,119	3,453	2,621	2,182	1,715	1,529	985	606
New Jersey	219	160	147	120	117	55	26	17
Pennsylvania	1,768	1,822	1,685	1,794	1,777	1,612	959	638
Delaware	39	28	19	23	22	12	7	4
Maryland	258	178	157	130	171	132	112	126
District of Columbia	1	.....	.....	1	.....	.....	.....	.....
Total Middle Atlantic States	7,404	5,642	4,629	4,249	3,802	3,341	2,089	1,391

Distribution of sheep, by States and divisions—1840–1910—Continued.

States.	1840	1850	1860	1870	1880	1890	1900	1910
Virginia	1,294	1,310	1,156	370	497	495	392	439
West Virginia	.....	.....	.....	552	675	785	573	567
North Carolina	538	595	624	463	462	402	209	140
South Carolina	233	286	234	125	119	79	52	28
Georgia	267	560	633	419	528	440	259	153
Florida	7	23	32	27	106	98	103	95
Alabama	163	372	383	242	348	386	229	109
Mississippi	128	305	354	233	288	452	236	156
Louisiana	98	110	203	119	136	186	169	139
Tennessee	742	812	803	827	673	541	308	470
Kentucky	1,008	1,102	1,006	937	1,000	937	716	778
Arkansas	42	91	209	161	247	244	169	97
Total Southern States, excluding Texas	4,521	5,567	5,636	4,474	5,077	5,047	3,415	3,172
Ohio	2,028	3,943	3,679	4,929	4,902	4,061	2,648	2,890
Indiana	676	1,122	1,023	1,613	1,101	1,180	1,011	812
Illinois	396	894	803	1,568	1,037	923	629	658
Michigan	100	746	1,320	1,986	2,189	2,400	1,626	1,545
Wisconsin	3	125	345	1,069	1,337	985	986	629
Total North Central States	3,203	6,831	7,170	11,165	10,566	9,450	6,900	6,535
Minnesota	.....	.....	16	132	268	399	359	452
Iowa	15	150	281	855	455	547	658	770
Missouri	348	763	1,033	1,352	1,411	951	664	1,116
Oklahoma	.....	.....	.....	.....	.....	17	49	49
Indian Territory	.....	.....	.....	.....	55	.....	13	.....
Kansas	.....	.....	19	109	630	401	180	204
Nebraska	.....	.....	2	23	247	209	336	240
North Dakota	.....	.....	.....	2	85	136	451	241
South Dakota	.....	.....	.....	.....	.....	239	507	501
Total Central West	363	913	1,352	2,474	3,152	2,899	3,217	3,574
Texas	.....	101	1,074	714	3,652	4,264	1,440	1,378
Arizona	.....	.....	.....	1	467	515	668	917
New Mexico	.....	377	972	619	3,939	2,474	3,334	2,895
Nevada	.....	.....	.....	11	231	273	568	825
Utah	.....	3	42	60	523	1,937	2,553	1,671
Colorado	.....	.....	.....	121	1,091	897	1,353	1,306
Wyoming	.....	.....	.....	6	450	713	3,327	4,827
Idaho	.....	.....	.....	1	117	858	1,965	2,110
Montana	.....	.....	.....	2	279	2,353	4,215	4,960
Washington	.....	.....	10	44	389	265	558	295
Oregon	.....	15	97	318	1,368	1,780	1,961	1,958
California	.....	18	1,111	2,768	5,727	3,373	1,725	1,525
Total Far West and Texas	.....	514	3,307	4,666	18,233	19,203	23,669	24,666
Total United States	19,311	[1] 21,723	23,977	[2] 28,478	42,192	40,876	39,853	39,644

[1] Probably about 23,000,000 mature sheep in the United States.
[2] Probably about 31,000,000 mature sheep.

Wool production, production retained for consumption, and net imports of foreign wool.[1]

[To the nearest thousand pounds.]

Year.	Production.	Production retained.	Net imports of foreign.	Year.	Production.	Production retained.	Net imports of foreign.
1822	.....	.....	1,716	1832	.....	.....	2,815
1823	.....	.....	1,073	1833	.....	.....	273
1824	.....	.....	1,291	1834	.....	.....	.....
1825	.....	.....	2,056	1835	.....	.....	7,196
1826	.....	.....	2,623	1836	.....	.....	12,296
1827	.....	.....	3,181	1837	.....	.....	10,260
1828	.....	.....	2,437	1838	.....	.....	6,786
1829	.....	.....	1,296	1839	.....	.....	7,806
1830	.....	.....	664	1840	[2] 35,802	35,802	9,813
1831	.....	.....	5,619	1841	.....	.....	14,863

[1] Ford, Wool and manufactures (1894), p. 304 and fol.: Statistical Abstract (1899), p. 334 (1915), p. 511. Census figure, pulled wool excluded.

Wool production, production retained for consumption, and net imports of foreign wool—Continued.

Year.	Production.	Production retained.	Net imports of foreign.	Year.	Production.	Production retained.	Net imports of foreign.
1842			10,850	1879	211,000	210,939	34,901
1843			[1] 3,497	1880	232,500	232,308	124,483
1844			14,078	1881	240,000	239,929	50,457
1845			23,825	1882	272,000	271,884	64,030
1846			16,505	1883	290,000	289,936	66,565
1847			8,249	1884	300,000	299,990	76,046
1848			11,379	1885	308,000	307,912	67,481
1849			17,822	1886	302,000	301,854	122,551
1850	[2] 64,000	63,964	18,695	1887	285,000	284,742	107,310
1851			32,578	1888	269,000	268,978	109,199
1852			17,993	1889	265,000	264,858	123,225
1853			21,404	1890	276,000	275,769	102,143
1854			20,033	1891	285,000	284,708	126,666
1855			18,190	1892	294,000	293,798	145,663
1856			16,729	1893	398,534	348,446	168,215
1857			18,460	1894	325,211	324,691	49,175
1858			25,562	1895	294,297	290,018	203,691
1859			33,030	1896	272,475	265,529	224,885
1860	[2] 72,250	71,194	26,126	1897	259,153	253,882	347,424
1861			31,639	1898	266,721	266,600	130,290
1862			43,698	1899	272,191	270,508	64,323
1863			74,413	1900	288,637	286,436	150,226
1864			91,027	1901 [3]	302,502	302,303	99,993
1865			43,741	1902	316,341	316,218	163,472
1866			70,436	1903	287,450	286,931	174,145
1867	160,090	159,693	37,539	1904	291,783	291,463	170,880
1868	168,000	167,442	22,665	1905	295,488	295,364	246,698
1869	180,000	179,556	38,934	1906	298,915	298,723	196,238
1870	162,000	161,847	47,520	1907	298,295	298,080	200,616
1871	160,000	159,975	66,753	1908	311,138	310,956	120,296
1872	150,000	149,859	124,163	1909	328,111	328,082	262,914
1873	158,000	157,925	78,456	1910	321,363	321,315	259,920
1874	170,000	169,680	36,123	1911	318,548	318,548	129,442
1875	181,000	180,822	51,334	1912	304,043	304,043	191,681
1876	192,000	191,895	43,124	1913	296,175	295,405	190,861
1877	200,000	199,920	39,082	1914	290,192	289,857	246,444
1878	208,250	207,902	42,497	1915	288,777	280,619	300,823

[1] Nine months only.
[2] Census figure, including revised estimates (census 1900, vol. 5, 8, cc. XV–XVI), pulled wool excluded.
[3] Data relate only to United States as a whole (1901–1915). Production (if any) for noncontiguous territory is lacking.

Tariff rates on raw wool, 1816–1912.[1]

Year.	Rates.
1816	15 per cent ad valorem.
1824	Value not over 10 cents per pound, 15 per cent ad valorem. Value over 10 cents per pound, 20 per cent first year and 5 per cent increase for two years, making 30 per cent ad valorem after June 1, 1826.
1828	4 cents per pound and 40 per cent ad valorem, first year, with 5 per cent ad valorem increase for two years, making 4 cents per pound and 50 per cent after July 1, 1830.
1832	Value not over 8 cents per pound, free. Value over 8 cents per pound, 4 cents per pound and 40 per cent.
1833	Duties of preceding act which were higher than 20 per cent to be reduced 1/10 every two years, beginning Jan. 1, 1834. In 1842, ½ the remainder to be removed, and the residue to be removed July 1, 1842.
1841	Value not over 8 cents per pound free. Value over 8 cents per pound 20 per cent.
1842	Value not over 7 cents per pound, 5 per cent. Value over 7 cents per pound, 3 cents per pound and 30 per cent.
1846	30 per cent.
1857	Value not over 20 cents per pound, free. Value over 20 cents per pound, 24 per cent.
1861	Value not over 18 cents per pound, 5 per cent. Value over 18 cents per pound to 24 cents per pound, 3 cents. Value over 24 cents per pound, 9 cents.
1862	No change.
1864	Value not over 12 cents per pound, 3 cents. Value over 12 cents per pound to 24 cents per pound, 6 cents. Value over 24 cents per pound to 32 cents per pound, 10 cents and 10 per cent. Value over 32 cents per pound, 12 cents and 10 per cent.

[1] Raw wool imported free of duty until 1816. This table prepared from Report of the Tariff Board of Schedule K of the Tariff Law, table facing p. 247; and pp. 287, 293–295.

Tariff rates on raw wool, 1816–1912—Continued.

Year.	Rates.
1867 [1]	Value not over 12 cents per pound, 3 cents; Value over 12 cents per pound, 6 cents... — Class III, Carpet Wool.
	Value not over 32 cents per pound, 10 cents and 11 per cent; Value over 32 cents per pound, 12 cents and 10 per cent... — Class I and II, Clothing and Combing Wool.
1872	Value not over 12 cents per pound, 2.7 cents; Value over 12 cents per pound, 5.4 cents..... — Class III.
	Value not over 32 cents per pound, 9 cents and 9.9 per cent; Value over 32 cents per pound, 10.8 cents and 9 per cent..... — Class I and II.
1875	Duties of 1867 restored.
1883	Value not over 12 cents per pound, 2½ cents; Value over 12 cents per pound, 5 cents..... — Class III.
	Value not over 32 cents per pound, 10 cents; Value over 32 cents per pound, 12 cents.... — Class I and II.
1890	Value not over 13 cents per pound, 32 per cent; Value over 13 cents per pound, 50 per cent.. — Class III.
	Class I, wool, 11 cents.
	Class II, wool, 12 cents.
1894	Free.
1897	Value not over 12 cents per pound, 4 cents; Value over 12 cents per pound, 7 cents.... — Class III.
	Class I and II, duties of 1890 restored.
1909	No change.
1913	Free.

[1] Act of 1867 and following years, double duty on Class I (clothing) wools, when washed. All wools, when scoured, three times the regular duty.

Price of Ohio washed fleece wool, fine, medium, and coarse, at the beginning of each quarter, calendar years from 1824 to 1915, inclusive, eastern markets.[1]

[Currency prices.]

Year.	January.			April.			July.			October.		
	Fine.	Medium.	Coarse.	Fine.	Medium.	Coarse.	Fine.	Medium.	Coarse.	Fine.	Medium.	Coarse.
	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
1824	68	53	40	70	46	31	55	40	30	60	40	30
1825	60	43	32	60	42	33	50	41	32	50	42	36
1826	55	43	38	52	46	41	37	30	26	43	37	32
1827	36	32	28	45	34	30	37	31	25	43	32	25
1828	42	30	25	44	36	28	48	38	33	48	40	32
1829	54	45	35	45	35	32	46	36	32	37	30	27
1830	40	35	30	50	38	32	60	50	40	70	60	48
1831	70	60	48	70	60	50	75	65	50	70	60	50
1832	65	55	44	60	52	42	50	42	30	50	40	30
1833	55	41	33	63	53	38	61	54	40	65	55	45
1834	70	60	48	67	56	44	60	50	40	62	50	40
1835	63	50	40	65	60	45	63	56	42	65	60	45
1836	65	60	45	68	62	47	70	60	50	70	60	50
1837	72	63	48	68	56	46	52	52	36	49	40	31
1838	50	42	35	50	42	35	46	36	30	56	48	37
1839	56	48	38	56	48	38	57	48	40	60	55	44
1840	50	45	38	49	43	36	45	39	33	46	38	33
1841	52	45	35	53	46	37	50	44	34	48	42	33
1842	48	42	35	46	40	32	43	37	30	38	31	25
1843	35	30	25	33	28	25	35	30	26	36	32	26
1844	37	30	26	43	36	30	45	37	32	50	40	33
1845	47	40	31	45	38	32	40	36	30	38	35	28
1846	40	35	30	38	33	28	38	32	27	36	30	22
1847	45	40	30	47	40	31	46	40	31	47	40	30
1848	45	38	30	43	37	30	38	32	28	33	30	24
1849	33	30	23	40	36	30	40	35	28	42	36	30
1850	47	40	33	45	37	30	45	37	30	46	40	35
1851	46	40	33	50	44	36	47	42	37	45	40	35
1852	43	38	34	42	36	33	45	38	33	50	42	37

[1] 1824–1853 from Wright, Wool Growing and the Tariff, p. 347; 1853–1915 from Statistical Abstract of the United States, 1899, p. 427; 1915, p. 518. Figures for 1824–1861 are also given in Randall, Fine Wool Sheep Husbandry (1862), p. 41 and following.

Price of Ohio washed fleece wool, fine, medium, and coarse, at the beginning of each quarter, calendar years from 1824 to 1915, inclusive, eastern markets—Continued.

Year.	January.			April.			July.			October.		
	Fine.	Medium.	Coarse.	Fine.	Medium.	Coarse.	Fine.	Medium.	Coarse.	Fine.	Medium.	Coarse.
	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
1853	58	56	50	62	56	50	60	53	48	55	50	48
1854	53	47	42	57	52	46	45	37	30	42	36	30
1855	40	35	32	43	35	32	50	40	33	52	41	36
1856	50	38	35	57	45	38	55	42	36	60	55	45
1857	58	50	42	60	56	45	56	50	40	38	30	25
1858	40	33	27	42	35	30	43	37	30	56	41	36
1859	60	52	45	60	46	37	56	40	35	60	50	42
1860	60	50	42	52	45	40	55	50	40	50	45	40
1861	45	40	37	45	37	32	38	30	22	47	48	50
1862	48	50	50	46	45	43	48	47	45	60	60	63
1863	75	68	70	80	85	80	75	70	65	85	80	76
1864	80	78	76	78	77	72	100	100	90	103	95	100
1865	102	100	96	80	80	75	75	73	65	75	75	65
1866	70	65	50	65	60	48	70	67	60	63	60	56
1867	68	63	50	60	55	50	55	49	45	48	46	40
1868	48	43	38	50	48	45	46	45	43	48	48	45
1869	50	50	48	50	50	48	48	48	47	48	48	46
1870	48	46	44	48	47	46	46	45	43	48	48	44
1871	47	46	43	50	52	47	62	60	55	63	62	58
1872	70	72	66	80	80	76	72	70	65	66	60	57
1873	70	68	65	56	53	48	50	48	44	54	53	47
1874	58	54	47	56	56	47	53	53	46	54	54	47
1875	55	56	47	54	52	46	52	49	46	48	50	42
1876	48	52	42	46	49	40	38	45	31	45	40	32
1877	46	43	36	45	40	33	50	34	37	48	44	36
1878	44	45	38	40	43	35	36	36	32	35	37	32
1879	34	35	32	34	34	31	37	38	34	41	43	38
1880	50	55	48	55	60	52	46	48	42	46	48	42
1881	47	49	43	40	44	37	42	44	36	43	46	36
1882	44	46	37	42	45	34	42	45	34	42	45	34
1883	40	43	33	44	44	37	39	41	33	39	40	34
1884	40	40	34	38	38	34	35	34	30	35	34	30
1885	34	33	29	32	32	28	32	31	28	33	35	32
1886	35	36	32	33	34	30	33	33	29	35	38	34
1887	33	38	34	33	37	33	34	37	34	32	36	34
1888	31	35	33	31	34	33	29	33	31	31	34	31
1889	34	38	33	33	37	31	35	39	32	33	37	31
1890	33	37	29	32	36	29	33	37	29	33	37	31
1891	33	37	31	32	37	31	31	35	29	31	35	30
1892	30	35	31	29	34	31	28	34	30	29	33	29
1893	29	33	29	30	32	31	24	26	25	23	24	21
1894	23	24	21	21	23	20	20	21	18	19	21	19
1895	17½	20	19	16½	20	18	18	21	19	18	21	19
1896	19	21½	19	19	21	18	17	18	17	18	19	18
1897	19	21	19	21	22½	20	21½	23½	21	27	29	25
1898	29	30	26	29	29½	25½	28	29	24½	28½	30	24½
1899	26½	29	24	25½	28	24	29	31½	27	31	33½	29
1900	35	36½	31½	32½	35½	30½	28½	31½	27½	26½	28½	26½
1901	27	29	26	25	27	24½	25	26	22	25	26½	23
1902	25½	26½	24	25	26½	24	26	26¾	25	28	28½	25½
1903	30	31	27	29½	30½	26	31½	31½	27	32	31½	28
1904	33½	32½	29½	33½	32½	29½	32½	32½	30½	32½	33½	31½
1905	34	35	36	34	36	36	36	39	36	35	35	34
1906	34	38	36	34	38	36	33	37	36	34	38	33
1907	34	39	36	34	38	36	34	36	35	35	38	34
1908	34	38	35	33	35	33	34	38	36	34	37	34
1909	34	38	35	35	40	37	35	40	37	35	40	36
1910	36	40	36	33	36	35	31	34	33	30	33	32
1911	30	34	32	30	33	32	28	30	30	30	32	31
1912	30	32	31	30	33	31	32	35	33	30	37	34
1913	30	36	34	29	35	33	27	34	33	26	33	30
1914	25	30	27	26	31	27	28	33	31	27	30	30
1915	29	36	34	31	39	36	30	39	37	31	42	40

Price of the above grades, gold basis, 1862–1879, inclusive.[1]

Year.	January.			April.			July.			October.		
	Fine.	Medium.	Coarse.	Fine.	Medium.	Coarse.	Fine.	Medium.	Coarse.	Fine.	Medium.	Coarse.
	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
1862	46[3]	48[3]	48[3]	45[1]	44[1]	42[1]	41[2]	40[3]	39	46[3]	46[3]	49
1863	51[3]	46[3]	48[1]	52[3]	56	52[3]	57[2]	53[2]	49[3]	57[2]	54[1]	51[2]
1864	51[2]	50	48[3]	45[1]	44[2]	41[3]	38[3]	38[3]	34[3]	49[2]	46	48[1]
1865	47[1]	46[1]	44[2]	53[3]	53[3]	50[2]	52[3]	51[2]	45[3]	51[2]	51[2]	44[3]
1866	50	46[2]	35[3]	51	47[1]	37[3]	46[1]	44[1]	39[2]	42[2]	40[2]	37[3]
1867	50[2]	39[2]	37[1]	44[1]	40[2]	36[3]	39	35[1]	32[1]	33[2]	32	28
1868	34[2]	31	27[2]	36	34[2]	32[2]	32[1]	31[2]	30[1]	35	35	32[3]
1869	36[3]	36[3]	35[2]	37[2]	37[2]	36	35[1]	35[1]	34[2]	36[3]	36[3]	35[1]
1870	39[2]	38	36[1]	42[2]	41[2]	40[3]	39[2]	38[2]	36[3]	42[2]	42[2]	39
1871	42[2]	41[2]	38[3]	45[1]	47	42[2]	55[1]	53[2]	49	55[3]	54[3]	51[1]
1872	64[1]	66	60[2]	72	72	68[2]	63	61[1]	57	58[1]	53	50[1]
1873	62	60[1]	57[3]	47[2]	45	40[3]	43[1]	41[2]	38	49[2]	48[3]	43[1]
1874	52	48[2]	42[1]	49[2]	49[2]	41[2]	48[1]	48[1]	41[2]	49[1]	49[1]	42[3]
1875	49	49[3]	41[3]	47	45[1]	40	45[1]	42[3]	40	41[1]	43	36
1876	42[2]	46	37[1]	40[2]	43[1]	35[1]	34	34[1]	27[3]	40[2]	36	29[2]
1877	43[1]	40[2]	34	42[1]	37[3]	31	47[1]	41[2]	35	46[3]	42[3]	35
1878	43[1]	44[1]	37[2]	39[2]	42[2]	34[2]	35[2]	35[2]	31[2]	34[2]	36[2]	31[2]

[1] Based on statement of average relative values of gold to United States paper currency in the New York market from suspension to resumption of specie payments during a period of 17 years, from 1862 to 1878, both inclusive, prepared by the U. S. Treasury Department.

Wool.

[Average weight per fleece, in pounds.[1]]

State or Territory.	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916
Maine	5.1	.....	5.5	5.1	5.3	5.5	5.3	5.5	5.6	5.7	5.7	5.8	5.7	5.9	5.9	5.9	6.2	6.0	6.0	6.0	6.2	6.3	6.1	6.1	6.3	6.5
New Hampshire	5.3	.....	5.4	5.8	5.5	6.6	6.0	6.1	5.5	5.7	5.2	5.6	5.5	5.6	5.8	6.1	6.0	6.0	6.0	5.8	6.1	6.4	6.2	6.1	6.3	6.6
Vermont	6.0	.....	6.0	6.2	5.6	5.0	6.1	6.2	6.3	6.4	6.2	5.9	6.1	7.1	6.1	6.7	6.7	6.2	6.2	6.8	7.0	7.0	6.1	6.5	7.1	7.5
Massachusetts	4.8	.....	4.8	4.9	5.1	5.1	5.5	5.6	5.8	5.9	6.0	5.3	5.4	5.8	5.7	6.0	6.2	6.5	6.3	6.5	6.4	5.8	6.2	6.2	6.4	7.0
Rhode Island	4.2	.....	3.8	4.0	3.5	5.0	4.0	4.2	4.3	4.7	4.4	4.6	4.9	4.2	4.6	5.1	5.2	5.4	5.5	5.0	6.0	5.2	5.1	4.9	5.0	5.0
Connecticut	4.2	.....	3.9	4.3	3.6	4.1	4.0	4.0	4.3	4.8	4.5	4.2	4.4	4.5	4.8	4.8	5.0	5.0	5.0	5.0	5.5	5.7	5.5	5.5	5.5	5.5
New York	5.3	.....	5.3	5.2	5.4	5.6	5.7	5.7	5.7	5.9	5.7	5.6	5.5	6.0	5.9	6.4	6.2	6.0	6.3	6.3	6.6	6.4	6.5	6.2	6.5	6.7
New Jersey	4.0	.....	3.5	4.5	4.2	3.8	4.5	4.8	4.7	4.9	4.7	4.6	4.5	5.1	4.7	5.1	5.5	5.6	5.6	5.3	5.6	5.4	5.2	5.5	5.6	5.0
Pennsylvania	5.1	.....	4.8	4.6	4.6	4.7	5.1	5.3	5.4	5.6	5.8	5.6	5.6	6.0	5.7	6.3	5.9	5.6	5.6	5.8	6.0	6.2	6.1	5.9	6.2	6.5
Delaware	4.8	.....	5.3	4.0	.....	3.5	4.7	4.7	4.5	4.5	6.1	4.6	4.3	5.5	5.1	5.3	4.5	4.7	5.4	5.5	5.5	5.4	5.4	5.4	5.7	5.8
Maryland	5.2	.....	5.6	5.1	4.6	4.6	5.0	4.7	4.9	5.0	5.2	4.9	5.3	5.2	5.1	5.6	5.3	5.2	5.5	5.5	5.5	5.6	5.5	6.0	5.9	5.8
Virginia	4.0	.....	4.1	4.1	3.8	4.0	4.5	4.0	4.2	4.2	4.3	4.1	4.4	4.2	4.2	4.5	4.5	4.5	4.6	4.6	4.4	4.5	4.6	4.6	4.7	5.0
West Virginia	4.3	.....	4.2	4.5	4.2	4.3	4.4	4.5	4.7	4.7	4.4	4.4	4.6	4.7	4.5	4.7	4.8	4.7	4.5	4.7	4.7	4.8	4.6	5.1	4.9	5.0
North Carolina	2.5	.....	2.8	3.2	3.3	3.7	3.3	2.7	2.9	3.1	3.1	3.2	3.3	3.4	3.4	3.5	3.4	3.6	3.6	3.7	3.7	3.8	3.9	3.9	3.9	4.3
South Carolina	2.8	.....	3.2	3.5	2.8	2.9	3.0	3.0	3.2	3.0	3.2	3.0	3.1	3.1	3.1	3.2	3.4	3.3	3.3	3.5	3.6	3.5	3.7	3.9	4.0	3.8
Georgia	2.6	.....	2.9	2.9	2.4	3.1	2.8	2.9	3.0	3.0	2.8	2.7	2.7	2.9	2.9	2.7	3.0	2.7	2.7	2.6	2.9	2.7	2.9	2.8	2.6	3.0
Florida	3.0	.....	2.9	3.3	2.8	2.5	2.8	2.9	3.0	2.9	3.0	3.2	2.8	3.1	3.0	3.2	3.4	3.1	2.9	3.1	3.0	2.8	3.1	3.1	3.1	3.1
Ohio	5.4	.....	5.1	5.1	5.2	5.2	5.4	5.4	5.5	5.8	5.7	5.9	6.3	6.1	6.3	6.3	6.4	6.4	6.6	6.5	6.6	6.6	6.7	6.5	6.8	7.0
Indiana	6.1	.....	5.8	5.7	5.2	5.7	5.6	6.2	6.2	6.4	6.1	6.1	6.1	6.2	6.5	6.7	6.7	6.4	6.5	6.5	6.7	6.6	6.5	6.4	6.8	6.8
Illinois	6.2	.....	6.0	6.5	6.2	6.8	6.5	6.7	6.6	6.8	6.8	6.8	6.7	7.0	7.0	7.4	7.5	7.2	7.2	7.3	7.3	7.4	7.5	7.0	7.5	7.5
Michigan	5.9	.....	6.0	5.7	5.3	5.8	6.2	6.5	6.4	6.7	6.5	6.5	6.6	6.6	6.7	7.0	7.0	6.7	6.8	6.8	7.0	6.9	6.8	6.8	6.9	7.3
Wisconsin	5.7	.....	5.7	6.0	5.6	6.2	6.6	6.6	6.9	6.9	6.7	6.6	6.6	6.7	7.1	7.5	7.1	6.8	7.1	7.0	7.3	7.0	7.3	7.1	7.2	7.6
Minnesota	5.5	.....	5.7	5.4	6.1	6.0	6.7	6.7	6.7	6.7	6.8	6.8	6.6	6.3	6.8	7.0	6.8	6.7	6.8	6.7	7.0	7.2	7.2	7.4	7.0	7.0
Iowa	6.8	.....	7.2	6.5	7.0	7.2	6.8	6.8	6.9	6.9	7.0	6.8	6.8	6.9	7.3	7.0	7.0	7.0	7.0	7.0	7.4	7.3	7.9	7.5	7.5	7.6
Missouri	5.6	.....	5.5	5.8	5.7	5.9	6.0	5.7	5.9	5.9	5.9	6.0	6.4	6.6	6.3	6.4	6.6	6.3	6.3	6.7	6.5	6.4	6.3	6.7	6.7	6.8
North Dakota	5.8	.....	6.4	7.1	6.7	6.9	6.0	6.6	6.7	6.5	6.8	6.3	6.5	6.3	6.3	6.6	6.5	6.5	6.7	6.5	7.0	7.2	7.2	7.5	7.2	7.5
South Dakota	5.6	.....	6.9	7.5	7.1	6.6	6.5	6.2	6.3	6.4	6.5	6.8	6.4	6.4	7.1	7.0	6.9	6.6	6.7	7.0	6.8	6.9	7.3	7.4	7.0	7.5
Nebraska	6.5	.....	6.3	6.5	6.2	4.8	6.6	6.1	6.2	6.3	6.4	6.3	6.5	6.9	7.0	7.1	7.0	6.3	6.8	6.8	7.3	7.8	7.4	7.6	7.4	8.0
Kansas	6.0	.....	6.3	6.0	5.8	6.9	7.3	6.9	7.3	7.1	7.0	6.9	6.9	6.4	7.1	7.0	7.5	6.8	7.0	7.2	6.7	7.0	6.9	7.0	7.1	7.2
Kentucky	4.9	.....	4.5	4.5	4.3	4.2	4.1	4.1	4.2	4.4	4.3	4.5	4.0	4.5	5.2	4.8	5.0	4.7	4.9	4.5	4.5	4.8	4.6	4.7	4.9	5.0
Tennessee	3.4	.....	3.8	3.9	3.6	3.6	3.8	3.7	3.7	3.8	3.9	3.8	4.4	3.3	4.0	4.0	4.4	4.1	4.3	4.2	3.7	4.0	4.2	4.2	4.4	4.4
Alabama	2.4	.....	2.8	2.8	2.9	2.3	2.6	2.6	2.7	2.8	2.8	2.5	2.8	2.8	3.2	2.9	3.3	3.1	3.1	3.0	3.2	3.0	3.3	3.8	3.8	3.5
Mississippi	3.0	.....	2.8	3.1	3.1	2.8	2.8	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.1	3.7	3.9	3.3	3.4	3.7	3.5	3.3	3.8	3.6	3.4	4.0
Louisiana	3.3	.....	2.8	3.2	3.0	3.2	3.0	4.0	3.8	3.3	3.5	3.2	3.7	3.4	3.1	3.8	4.9	3.3	3.5	3.8	3.7	4.1	3.5	4.0	3.7	3.7
Texas	4.4	.....	4.2	5.1	6.0	5.4	5.5	5.2	5.4	5.4	5.3	5.3	4.6	5.4	5.5	6.0	6.0	6.2	5.9	6.0	5.9	6.1	6.3	6.5	6.4	7.0
Oklahoma	.....	.....	.....	7.0	5.0	.....	5.0	6.5	6.4	6.0	6.4	6.0	6.1	5.9	6.1	6.3	5.5	6.0	5.0	6.0	5.8	6.5	5.6	5.9	7.0	6.7
Arkansas	2.9	.....	2.9	3.4	2.8	3.9	5.0	3.1	3.5	3.6	3.3	3.4	3.5	3.9	3.2	3.7	3.5	3.6	3.7	3.8	4.0	4.0	4.2	4.5	4.5	4.4
Montana	5.7	.....	6.3	6.6	6.4	7.6	7.0	6.8	7.1	7.3	7.2	7.5	7.2	7.3	7.3	7.4	7.4	7.2	7.7	7.7	7.6	7.5	7.5	7.8	7.7	7.8
Wyoming	5.3	.....	8.0	7.4	8.1	7.7	8.0	7.8	7.8	7.9	7.8	7.3	7.2	7.5	7.9	8.2	7.5	8.0	8.0	7.6	7.8	7.4	8.3	8.0	8.0	8.5
Colorado	4.8	.....	5.7	5.5	5.8	4.9	5.8	6.0	6.1	6.3	6.4	6.3	5.6	5.4	6.0	5.5	6.6	5.9	6.2	6.0	6.0	6.0	5.3	5.4	6.0	6.0
New Mexico	2.5	.....	3.7	4.1	.....	6.0	4.0	3.2	3.8	3.8	4.0	4.2	4.1	5.2	5.3	5.2	5.5	5.7	6.5	6.1	6.0	5.5	5.7	5.9	5.6	5.7
Arizona	4.5	.....	.....	5.0	4.7	6.2	5.0	5.2	4.8	5.9	6.2	5.6	6.7	5.1	5.5	6.8	6.8	6.5	6.2	7.7	7.5	7.2	6.8	6.7	6.5	6.5

Utah	4.7	----	5.3	5.7	5.4	5.4	6.0	5.5	5.6	6.0	6.0	6.9	6.3	7.2	7.0	6.9	7.5	7.0	7.8	7.3	7.3	7.5	7.2	7.4	7.4	7.2
Nevada	5.3	----	7.0	6.0	5.6	5.5	6.0	6.9	6.9	7.5	7.3	8.3	7.0	7.3	7.5	7.7	7.2	6.9	7.3	7.0	7.0	7.5	7.5	7.4	7.7	7.5
Idaho	5.0	----	7.4	6.8	6.6	6.0	7.0	8.0	7.4	7.8	7.7	7.5	5.4	7.3	7.3	8.0	7.5	7.5	7.8	7.3	7.6	7.6	7.7	7.8	7.9	7.3
Washington	5.2	----	6.1	6.7	7.3	7.2	8.0	7.5	7.7	7.9	7.8	7.6	8.6	8.1	8.4	7.7	7.6	8.0	8.2	7.7	7.9	8.2	8.3	8.0	8.3	8.0
Oregon	5.7	----	6.4	6.4	8.1	6.9	7.0	7.2	7.3	7.5	7.7	7.6	8.0	7.5	8.3	7.9	8.2	8.0	8.0	7.7	7.9	8.1	8.2	8.0	8.0	8.1
California	5.1	----	4.9	5.2	4.5	5.2	5.5	5.1	5.2	5.5	5.3	5.3	5.4	5.6	5.7	5.3	5.9	5.3	5.5	5.7	5.6	5.6	5.8	6.5	6.3	6.4
United States	4.9	----	5.3	5.4	5.6	5.7	5.8	5.8	5.9	6.2	6.3	6.1	6.4	6.6	6.7	6.7	6.7	6.6	6.8	6.7	6.8	6.7	6.8	6.8	6.8	6.9

[1] Prepared by Bureau of Crop Estimates, U. S. Dept. of Agriculture.