# Reports of the Kansas State Board of Agriculture

**Section 279, Pages 8341 - 8370**

These reports by the State Board of Agriculture include the proceedings of the board, reports for the previous year, maps of counties, abstracts of counties, miscellaneous articles, and reports of agricultural societies, the state fair, state and county statistics, agricultural industries and products, the agricultural college, and the Kansas Academy of Science. The annual reports began in 1872 and were succeeded by biennial reports beginning in 1877-78. Volume numbers were discontinued with the 1953-1956 report; the last being volume 44. From 1953 to 1976 the reports drop "biennial" from the title. Annual reports begin again from 1976 to 1984, except 1982-1983 which is biennial. The dates for each report reflects the reporting year and not the publication date, which was usually a year later. The title of each report reflects the form given on the title page. Only volumes 1 (1872), 2 (1873), 3 (1874), 4 (1875), the centennial edition (1875), 5 (1876), 6 (1877-1878), 7 (1879-1880), 10 (1885-1886), 11 (1887-1888), 13 (1891-1892), and 14 (1893-1894) are currently available.

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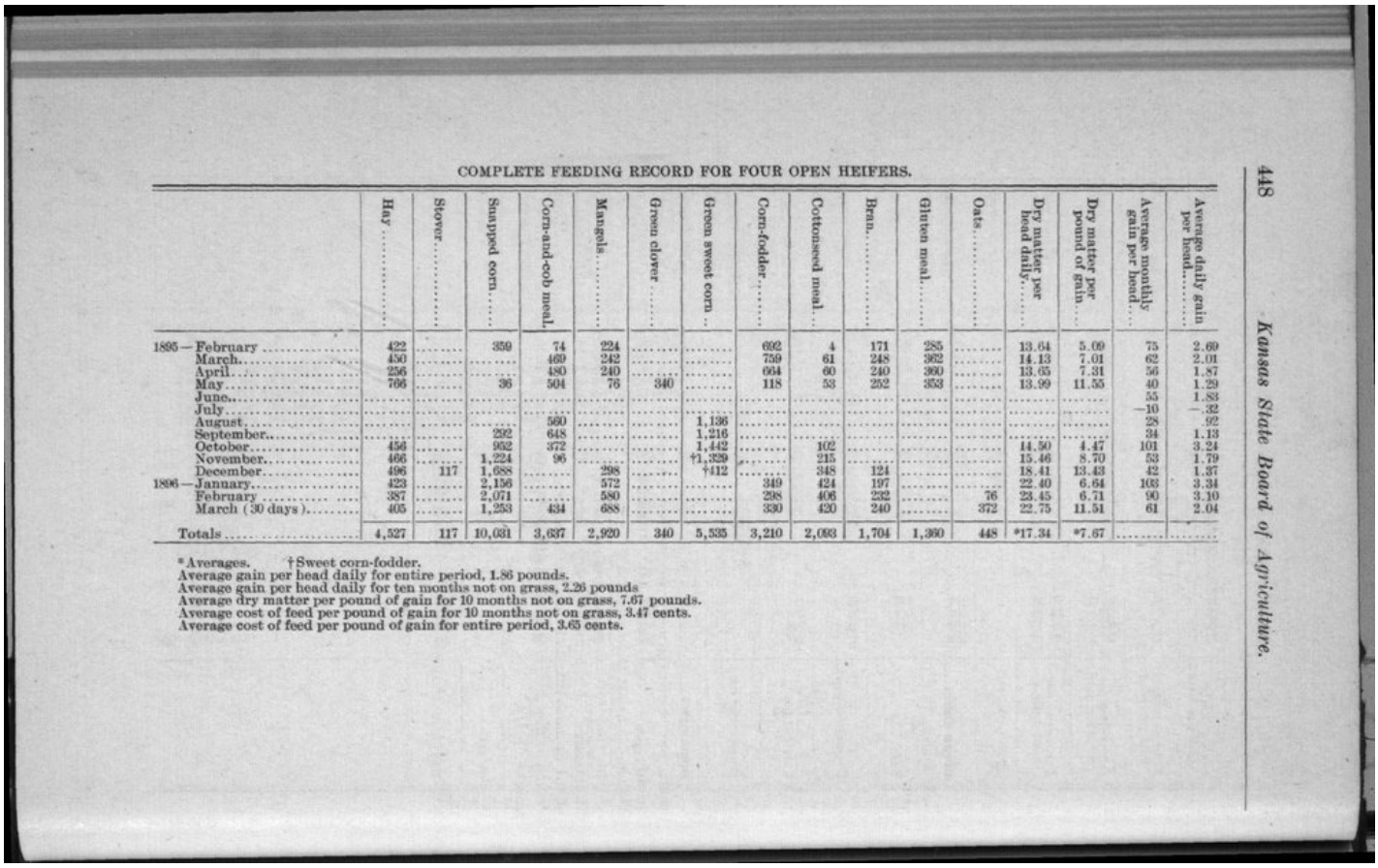
## Reports of the Kansas State Board of Agriculture





COMPLETE FEEDING RECORD FOR FOUR OPEN HEIFERS.

| | Hay | Stover | Snapped corn | Corn-and-cob meal | Mangels | Green clover | Green sweet corn | Corn-fodder | Cottonseed meal | Bran | Gluten meal | Oats | Dry matter per head daily | Dry matter per pound of gain | Average monthly gain per head | Average daily gain per head |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1895—February | 422 | ..... | 359 | 74 | 224 | ..... | ..... | 692 | 4 | 171 | 285 | ..... | 13.64 | 5.09 | 75 | 2.69 |
| March | 450 | ..... | ..... | 469 | 242 | ..... | ..... | 759 | 61 | 248 | 362 | ..... | 14.13 | 7.01 | 62 | 2.01 |
| April | 256 | ..... | ..... | 480 | 240 | ..... | ..... | 664 | 60 | 240 | 360 | ..... | 13.65 | 7.31 | 56 | 1.87 |
| May | 766 | ..... | 36 | 504 | 76 | 340 | ..... | 118 | 53 | 252 | 353 | ..... | 13.99 | 11.55 | 40 | 1.29 |
| June | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 55 | 1.83 |
| July | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | —10 | —.32 |
| August | ..... | ..... | ..... | 560 | ..... | ..... | 1,136 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 28 | .92 |
| September | ..... | ..... | 292 | 648 | ..... | ..... | 1,216 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 34 | 1.13 |
| October | 456 | ..... | 952 | 372 | ..... | ..... | 1,442 | ..... | 102 | ..... | ..... | ..... | 14.50 | 4.47 | 101 | 3.24 |
| November | 466 | ..... | 1,224 | 96 | ..... | ..... | †1,329 | ..... | 215 | ..... | ..... | ..... | 15.46 | 8.70 | 53 | 1.79 |
| December | 496 | 117 | 1,688 | ..... | 298 | ..... | †412 | ..... | 348 | 124 | ..... | ..... | 18.41 | 13.43 | 42 | 1.37 |
| 1896—January | 423 | ..... | 2,156 | ..... | 572 | ..... | ..... | 349 | 424 | 197 | ..... | ..... | 22.40 | 6.64 | 103 | 3.34 |
| February | 387 | ..... | 2,071 | ..... | 580 | ..... | ..... | 298 | 406 | 232 | ..... | 76 | 23.45 | 6.71 | 90 | 3.10 |
| March (30 days) | 405 | ..... | 1,253 | 434 | 688 | ..... | ..... | 330 | 420 | 240 | ..... | 372 | 22.75 | 11.51 | 61 | 2.04 |
| Totals | 4,327 | 117 | 10,031 | 3,637 | 2,920 | 340 | 5,535 | 3,210 | 2,093 | 1,704 | 1,360 | 448 | *17.34 | *7.67 | ..... | ..... |

*Averages. †Sweet corn-fodder.
Average gain per head daily for entire period, 1.86 pounds.
Average gain per head daily for ten months not on grass, 2.26 pounds
Average dry matter per pound of gain for 10 months not on grass, 7.67 pounds.
Average cost of feed per pound of gain for 10 months not on grass, 3.47 cents.
Average cost of feed per pound of gain for entire period, 3.65 cents.

In the foregoing computation the feeds used prior to the grazing period were rated at the following prices, based upon local market values prevailing at that time:

| | Cents per cwt. |
|---|---|
| Gluten meal | 70 |
| Snapped corn | 56 |
| Hay | 30 |
| Corn-fodder | 20 |
| Corn-and-cob meal | 75 |
| Bran | 70 |
| Ear corn | 65 |
| Mangels | 5 |
| Green clover | 2½ |

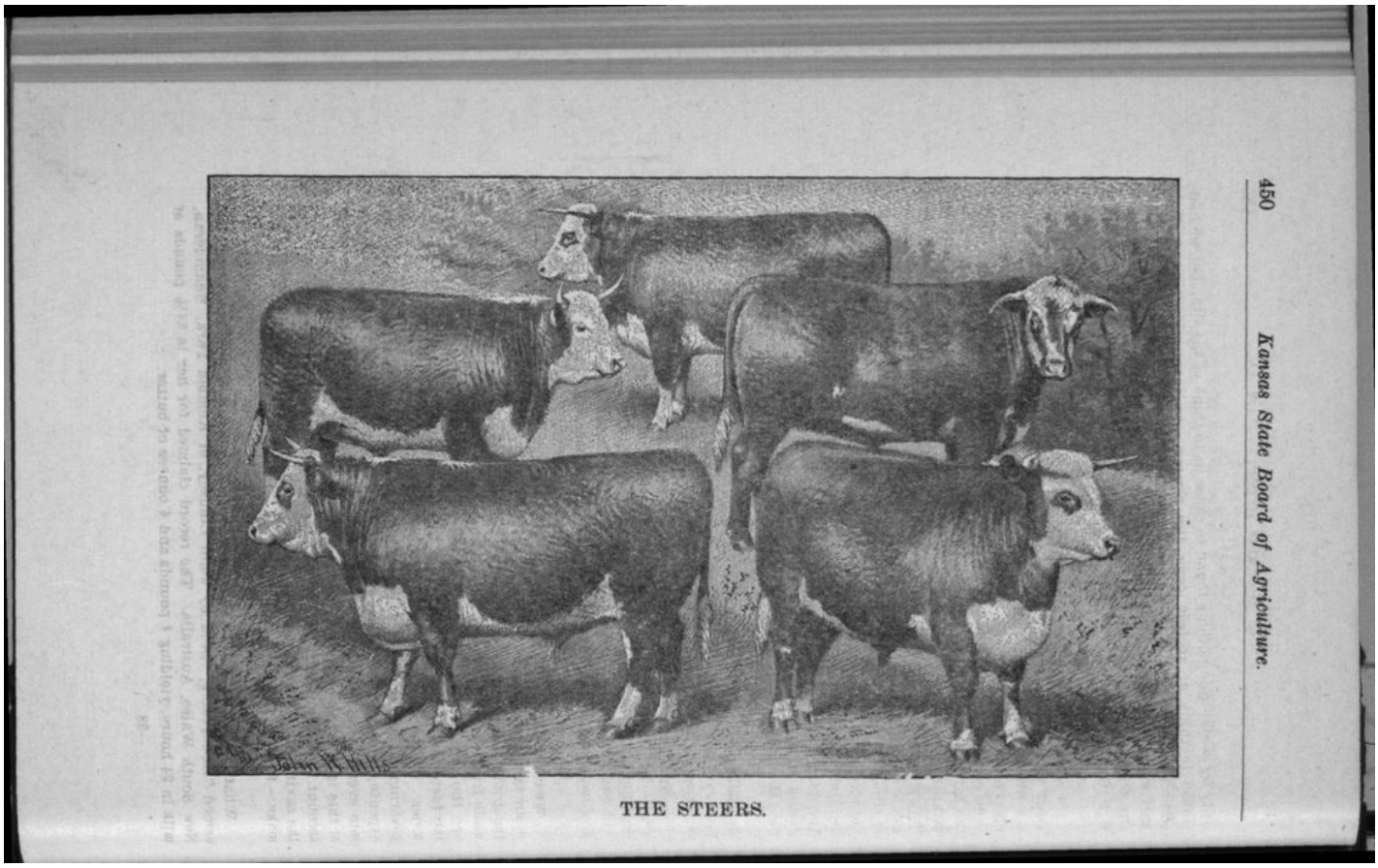
During the grazing period the pasture was charged at the rate $1 per head each month, and in the last period the feeds used were rated at the following prices:

| | Cents per cwt. |
|---|---|
| Green sweet corn | 2½ |
| Snapped corn | 20 |
| Oats | 40 |
| Hay | 28 |
| Corn-stover | 10 |
| Corn-and-cob meal | 30 |
| Cottonseed meal | 85 |
| Bran | 40 |
| Mangels | 5 |

These prices represent a wide range in values of the principal feeding stuffs, but the variation is due to the transition from a year of very severe drouth (1894), and consequent shortage of grain crops, to one of great abundance of all farm feeds.

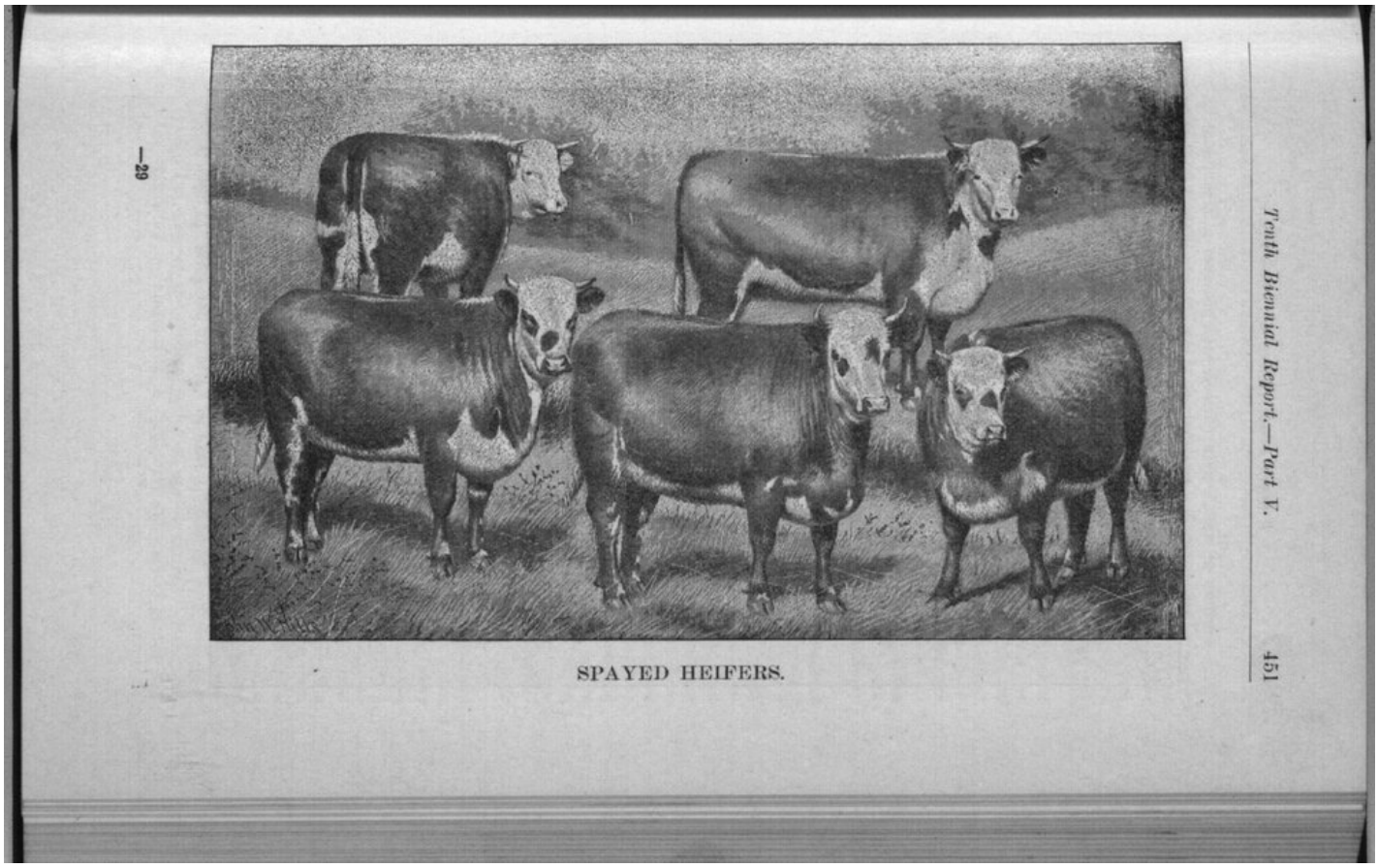
The illustrations appearing on the following pages represent the cattle at the close of the feeding experiment. These are very faithful likenesses of all animals of each lot, and indicate the superiority of form and finish demonstrated by the record made in the slaughter and block test reported in another place.

# Reports of the Kansas State Board of Agriculture

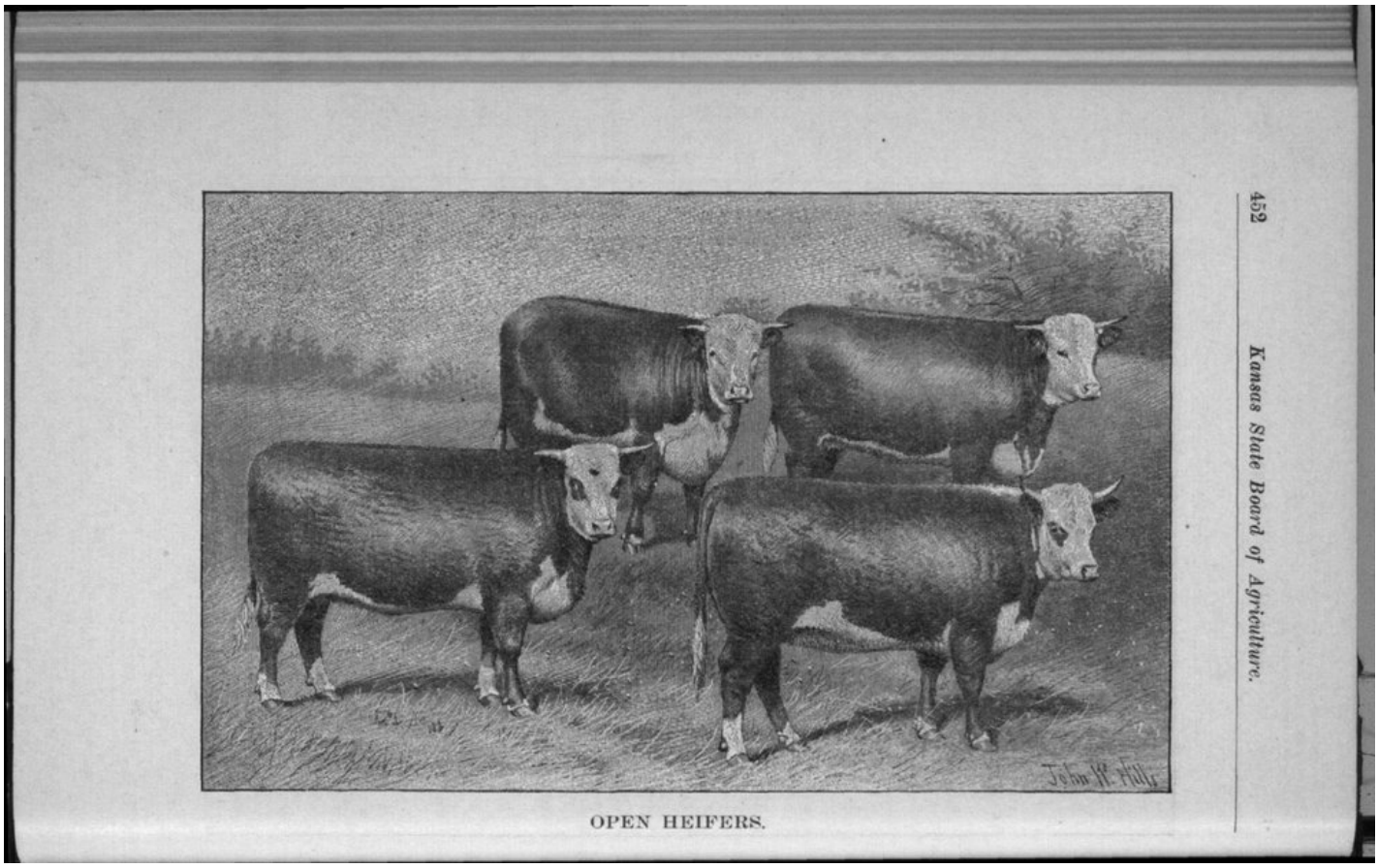




THE STEERS.



SPAYED HEIFERS.





OPEN HEIFERS.

The individuals in each lot were selected with a view to uniform excellence and good feeding quality, and each class was well represented. As before stated, all of these cattle were by the same sire and from a uniform herd of cows, except the two that were purchased from Mr. Redhead. These are shown in rear of the open-heifer group. One of them was perhaps the best animal in this lot, and the other was considered the poorest, though there was no great variation in any of them, and these two averaged about the same as the others.

It will be seen by reference to the feeding record that the open-heifer lot made the best returns in the feed yard, the gains being not only the largest but also from the least feed. The steers ranked next to the open heifers, and the spayed heifers made practically the same gains, at about the same cost.

In the former investigation of this subject by the station, in 1893-'94, the steers made both larger and cheaper gains than either lot of heifers. This result was doubtless in part due to the disadvantage of several representatives of the heifer lot proving to be in calf, though the individual record of each animal showed that the heifers that were free from calf also failed to make as good average gains as the steers.

It should also be noted that two heifers in the latter experiment dropped calves. Mention has already been made of spayed heifer No. 417 dropping a calf in November, 1894. This was soon after the operation of spaying, and caused little, if any, interruption, as she made a gain of 45 pounds in the month of November. This heifer is shown in the center of the spayed-heifer group. Open heifer No. 418, shown at the left of the illustration of the open-heifer group, also gave evidence of being in calf soon after the feeding test began, and Doctor Niles, of the veterinary department, gave treatment causing her to abort March 4. This interruption prevented any gain by this heifer in the month of March. Her weight on March 1 was 780 pounds, and on April 1 it was the same. In the following month, however, her gain was 70 pounds, the largest made by any heifer in the lot during that month. It is unusual with heifers of this age to get with calf, and it was thought that in starting with animals under one year of age the danger of that kind of interruption would be avoided, but in this case it is evident that the heifers became pregnant when not over six or seven months old, while yet with their dams and other cattle in the pasture.

The object of this experiment was to compare the feeding value of heifers with that of steers under like conditions, and to get indications of the effect of spaying on one-half of the heifers. A comparison shows that in this case spaying was not beneficial, as the open heifers made a gain of 2.26 pounds per head daily for the 10 months of yard feeding, the time when we could control the actual amount of nutrients each lot consumed. The spayed heifers gained 2.03 pounds per head daily during the same time. Individuality may have operated, but as careful a division as could be was made before spaying. We can go the length of saying that we have found no advantage to the spayed lot from the operation in this experiment. Spaying does not suppress nature altogether. The spayed heifers did not come in heat as regularly as the open heifers, but they did come in heat occasionally during the earlier months of feeding, and it may be added that as the fattening process went on, evidences of being in heat diminished with both lots, until toward the close of the feeding period it ceased entirely. It is well settled that fattening is antagonistic to fecundity. The steers gained 2.07

pounds per head daily during the 10 months of yard feeding, which is slightly less than the average gain of both lots of heifers.

The open heifers made this gain in live weight from 7.67 pounds of dry matter for a pound of gain; that is, from nutrients estimated after the organic moisture was deducted. The spayed heifers made their gain on 8.60 pounds of dry matter for a pound of added weight; while the steers required 8.70 pounds of dry matter to gain a pound in weight. This controlled the cost of the gains made, which for the open heifers was 3.47 cents; for the spayed heifers, 3.88 cents; and for the steers, 3.90. The heifer commends herself to the feeder in comparison with the steer. In this experiment she made gains on less feed and at less expense.

The average daily gains for the entire period are less than those for the 10 months of yard feeding. The table shows that gains were decidedly less during the four months of pasturing, and the cost of gain was also greater. This is contrary to the results of former experiments at this station, with one exception, and that was a bunch of cattle reported in Bulletin 32, and grazed under similar conditions to these. When these cattle went to grass they had been on good rations for four months, in fact on fattening rations for animals of their age and weight, although they were not fed heavily. Very excellent pasture conditions are required to keep up a two-pound-a-day gain on as young animals as they were. We did not have such conditions. It is an open question how fat an animal should be to make best gains on different pastures.

Bulletin 20 of this station (page 688) shows grazing results from 18 steers on clover pasture; one-half of them getting corn-meal gained 2.32 pounds per head daily; the other half of them, on oil-meal, gained 2.03 pounds per head daily. The cattle in that experiment were a year older than the steers and heifers under consideration. The cattle reported in Bulletin 20 were on clover; the steers and heifers in this experiment were on timothy and blue-grass pasture. The former had grain regularly while on pasture; the latter had grain only during the last two months. Gains made on grass throughout the West are generally on cattle in lean condition in spring, or on cattle half fat when grazing begins, to which corn is regularly fed. The cattle in this experiment made about half the gains on grass that they did in the yards; the cattle in Bulletin 20, on the finest conditions possible, with liberal amounts of corn-meal to one-half of them and oil-meal to the other half, did not make as good gains as they did in the yards. We have yet to learn of grazing cattle making as good gains as stall- or yard-fed cattle, although as before stated the gains produced on pasture are almost invariably made at less expense than by yard or stall feeding.

During the preceding summer, 1894, the station had 20 head of 2-year-old feeding steers on this same pasture for three months. Ten head of these cattle had a daily allowance of 10 pounds of corn-and-cob meal per head, and made an average daily gain of 2.13 pounds per day, and 10 head made an average daily gain of 2.01 pounds per head from grass alone. This was in the season of excessive drouth, when the rainfall at this place during the summer grazing months was less than one-half that of 1895. Those results are reported in Bulletin 28 of this station. The cattle in this experiment were a year younger than both of the other bunches to which we have referred. To what extent the age may have influenced the results is not known.

The gain of January on all lots deserves notice. The steers reached 2.72 pounds, the highest monthly gain; the open heifers reached 3.34 pounds, being

their highest; and the spayed heifers gained 2.57 pounds, exceeded only in the month of October, during which month all the lots made heavy gains that may perhaps be partially attributed to the change from pasture to feed-yard conditions and an increase of stomach contents. The January gains were made on an increase of dry matter, but the increase had been gradual, from a fraction over 14 pounds a day to each lot in October, to 23 in January, culminating in 25.65 for the steers, 23.45 for the open heifers, and 24.64 for the spayed heifers in February, after which it was reduced in each case, although only very little for the steers. These were the months where the greatest gains were made. Both lots of heifers exceeded the steers in gains during the last six months, from October to March, and the heifers made greater gains than the steers on less feed during the last three months.

The increase in feed for January was considerable, both in snapped corn and cottonseed meal, but the nutritive ratio was not changed radically. There was an increase in the mangels, that perhaps had an influence on the digestion of the animals. Bulletin 32, page 434, calls attention to the value of roots in feeding dairy cows. Wolff, a German experimenter, finds that the digestibility of crude protein of coarse fodders is decreased when the dry matter of roots or potatoes is fed heavily, equal to a sixth or a half of the entire ration. We have never fed roots so heavily. The dry matter of the mangels fed in this experiment being only, at most, about 2 per cent. of the entire rations.

We are aware that extensive root feeding is not practical in Iowa in beef-making, but the farmer feeding a few finely-bred steers raised on his farm, designed to sell in the extra-steer class, may find it profitable during winter to provide a few pounds of mangels daily to aid digestion. There is a point beyond which added feed is not profitable. The January ration was not as heavy as that fed in February to any of the lots, yet the January gain was greatest. No rule can be laid down regarding the amounts of feed that will be most profitable; the feeder must be the judge, and the appetites of the animals will be the best indication.

From the time these cattle were brought from the pasture to the feeding yards, October 1, to April 1, they were on full feed and had all they would eat up promptly with a good, keen appetite for each feed. Heavier gains have been made in some of the former experiments at this station than those recorded here, but on larger cattle and at a greater ratio of feed per pound of gain. The rate of increase in this experiment is one pound of gain in live weight for each 8⅛ pounds of dry matter in the feed consumed, while, as stated on page 536 of this bulletin, the average amount of dry matter per pound of gain in cattle is over 10 pounds. Large cattle will produce heavier daily gains, but they are usually produced at greater cost.

Cottonseed meal was fed liberally to these cattle from October to April, as will be noted by referring to the feeding record. It was also fed moderately during the first winter. The results from the use of this feed for fattening cattle at the Iowa station have been very satisfactory in all respects. Toward the close, when the cattle were being crowded to their full capacity, we fed liberally of roots and also added some oats to the ration. Both of these feeds were highly relished, and they were used mainly to induce the animals to eat and digest as heavy a ration as possible. We place a high estimate upon the value of roots for this purpose. All the cattle marketed by this station since 1892 have been fattened and finished on corn, supplemented toward the end with some nitrogenous product, and roots. This contributes to the high finish, in conjunction with large gains, and smooth, even flesh, of superior quality, that

has characterized the station cattle. Five shipments of cattle from the station since 1892 have topped the market in every case but one, and in some cases by as much as 50 cents per hundred. The percentage of dressed beef and the record made on the block by this and other shipments have, we believe never been equaled by a car-load lot. We call attention to these results for the purpose of emphasizing the value of good methods in feeding well-bred animals.

SHIPMENT AND SALE OF THE CATTLE.

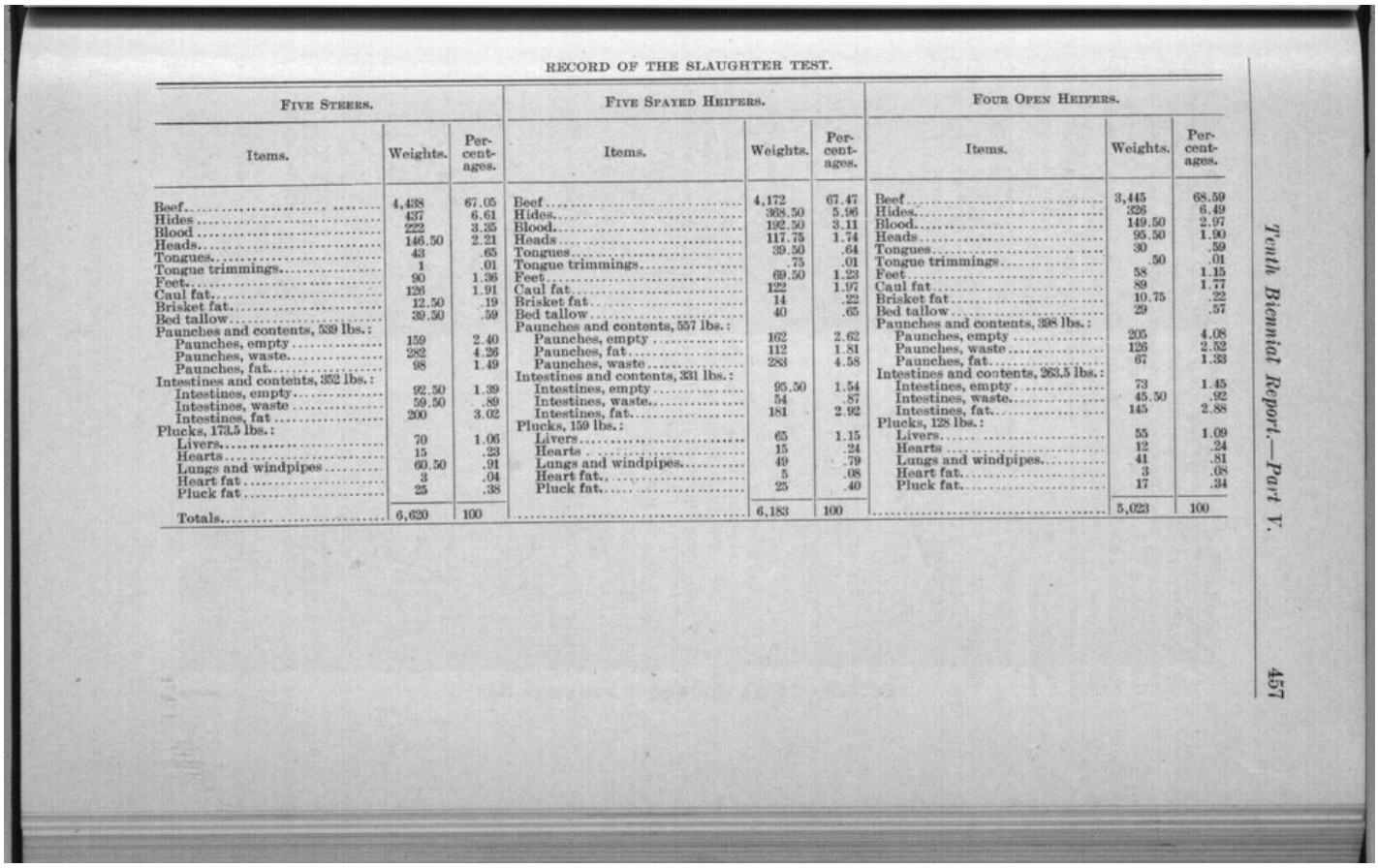
The three lots of cattle were prepared for shipment by withholding the water and evening grain feed on March 31, and giving a double allowance of hay. On the morning of April 1 each lot was given 12 pounds of snapped corn per head, but no water. At 10 o'clock a. m. they were weighed and loaded in a car side-tracked at the station yards. The car was deeply bedded with straw and had racks filled with hay.

The average weights taken at home just before loading were as follows: Steers, 1,388; spayed heifers, 1,300; and open heifers, 1,337. The selling weights in Chicago, April 2, were: steers, 1,346; spayed heifers, 1,264; open heifers, 1,285. These are heavier shrinkages than our cattle usually sustain in going to Chicago, but much of it is probably due to the day in the yards being so cold and disagreeable as to prevent a good fill. The total shrink from the final weights on full feed and water at our yards was 50 pounds on the steers, 53 pounds on the spayed heifers, and 59 pounds on the open heifers. The cattle were purchased by Swift & Co., at $4.50 per hundred for the steers, and $4.25 for the heifers, both lots being rated alike. The highest price paid for any other cattle on the market that day was $4.40 for steers. They were sold in the open market Thursday, April 2, in competition with 5,500 head of other cattle.

The Breeder's Gazette of current issue, said:

"Some buyers were disposed to consider them about as fat a bunch as has been seen in the yards in years. They were also pronounced about as good a bunch as had crossed the scales in a long time. . . . They were prime cattle, including some that would have ranked high at the fat-stock show, and the bunch averaged a dress of 67.7 per cent."

The cattle were killed by Swift & Co. and subjected to a careful detailed test on the following day, April 3.

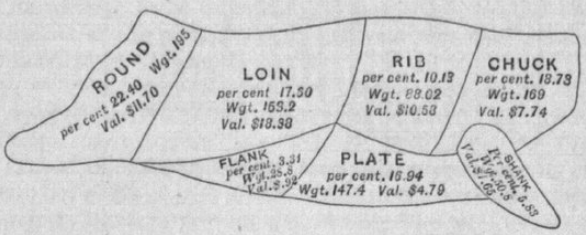


RECORD OF THE SLAUGHTER TEST.

| Five Steers. | | | Five Spayed Heifers. | | | Four Open Heifers. | | |
|---|---|---|---|---|---|---|---|---|
| Items. | Weights. | Per-centages. | Items. | Weights. | Per-centages. | Items. | Weights. | Per-centages. |
| Beef | 4,438 | 67.05 | Beef | 4,172 | 67.47 | Beef | 3,445 | 68.59 |
| Hides | 437 | 6.61 | Hides | 368.50 | 5.96 | Hides | 326 | 6.49 |
| Blood | 222 | 3.35 | Blood | 192.50 | 3.11 | Blood | 149.50 | 2.97 |
| Heads | 146.50 | 2.21 | Heads | 117.75 | 1.74 | Heads | 95.50 | 1.90 |
| Tongues | 43 | .65 | Tongues | 39.50 | .64 | Tongues | 30 | .59 |
| Tongue trimmings | 1 | .01 | Tongue trimmings | .75 | .01 | Tongue trimmings | .50 | .01 |
| Feet | 90 | 1.36 | Feet | 69.50 | 1.23 | Feet | 58 | 1.15 |
| Caul fat | 126 | 1.91 | Caul fat | 122 | 1.97 | Caul fat | 89 | 1.77 |
| Brisket fat | 12.50 | .19 | Brisket fat | 14 | .22 | Brisket fat | 10.75 | .22 |
| Bed tallow | 39.50 | .59 | Bed tallow | 40 | .65 | Bed tallow | 29 | .57 |
| Paunches and contents, 539 lbs.: | | | Paunches and contents, 557 lbs.: | | | Paunches and contents, 398 lbs.: | | |
| Paunches, empty | 159 | 2.40 | Paunches, empty | 162 | 2.62 | Paunches, empty | 205 | 4.08 |
| Paunches, waste | 282 | 4.26 | Paunches, fat | 112 | 1.81 | Paunches, waste | 126 | 2.52 |
| Paunches, fat | 98 | 1.49 | Paunches, waste | 283 | 4.58 | Paunches, fat | 67 | 1.33 |
| Intestines and contents, 352 lbs.: | | | Intestines and contents, 331 lbs.: | | | Intestines and contents, 263.5 lbs.: | | |
| Intestines, empty | 92.50 | 1.39 | Intestines, empty | 95.50 | 1.54 | Intestines, empty | 73 | 1.45 |
| Intestines, waste | 59.50 | .89 | Intestines, waste | 54 | .87 | Intestines, waste | 45.50 | .92 |
| Intestines, fat | 200 | 3.02 | Intestines, fat | 181 | 2.92 | Intestines, fat | 145 | 2.88 |
| Plucks, 173.5 lbs.: | | | Plucks, 159 lbs.: | | | Plucks, 128 lbs.: | | |
| Livers | 70 | 1.06 | Livers | 65 | 1.15 | Livers | 55 | 1.09 |
| Hearts | 15 | .23 | Hearts | 15 | .24 | Hearts | 12 | .24 |
| Lungs and windpipes | 60.50 | .91 | Lungs and windpipes | 49 | .79 | Lungs and windpipes | 41 | .81 |
| Heart fat | 3 | .04 | Heart fat | 5 | .08 | Heart fat | 3 | .08 |
| Pluck fat | 25 | .38 | Pluck fat | 25 | .40 | Pluck fat | 17 | .34 |
| Totals | 6,620 | 100 | | 6,183 | 100 | | 5,023 | 100 |

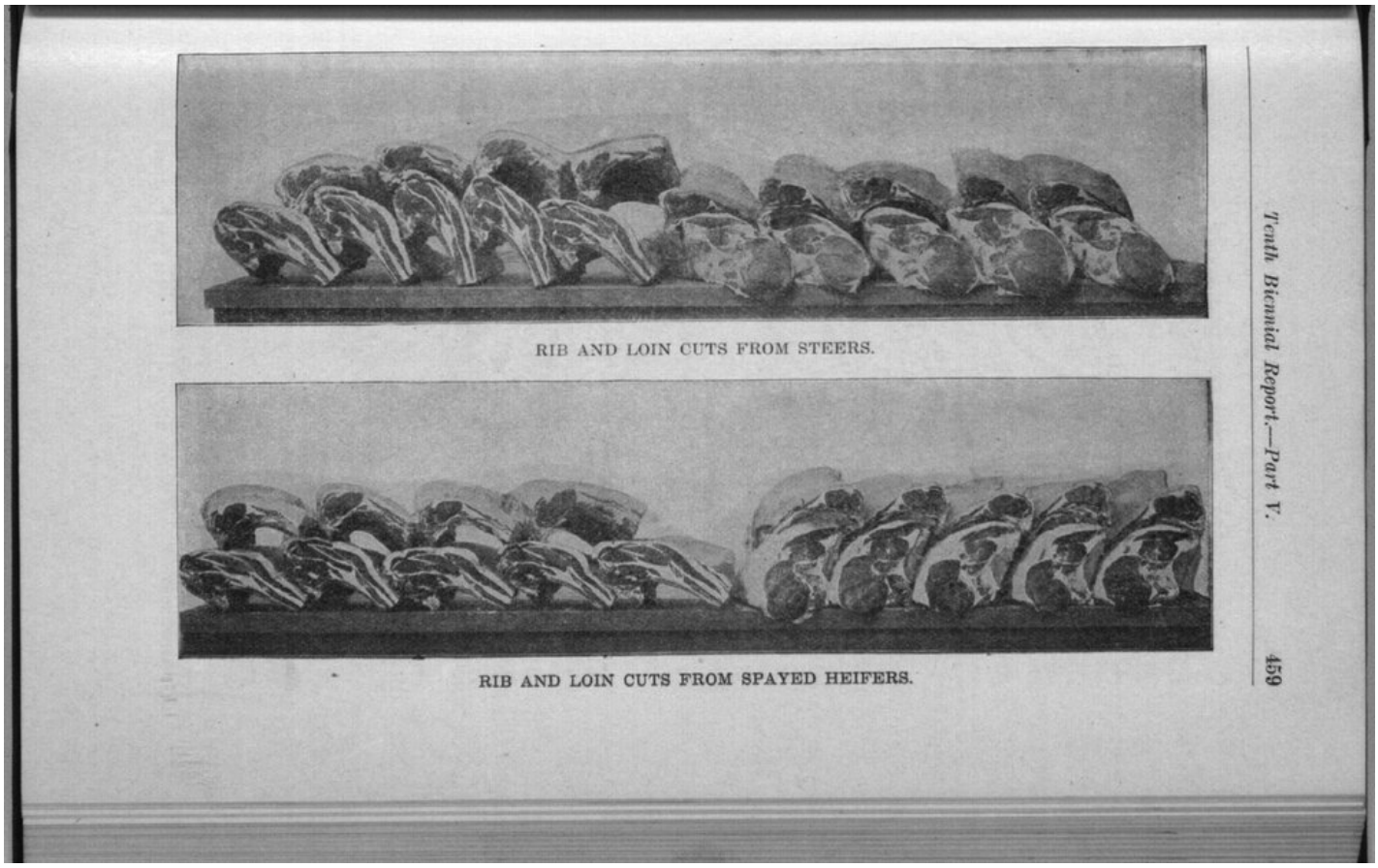
It will be seen that both lots of heifers dressed out a higher percentage of beef than the steers. Aside from this, no material difference is revealed in the slaughter test. The weights and percentages of head and feet of heifers indicate a slightly finer bone and correspondingly less waste in these parts. It is commonly held that heifers run more to fat, on the block, than steers. The records of this test indicate but very slight variation in the internal fat, and when any difference is apparent the steers generally present the larger amounts. The distinctions brought out by the slaughter test in this experiment, though comparatively small, are in favor of the heifers, and to that extent the heifer carcasses were the most profitable to the butcher.

The following diagram represents Swift & Co.'s method of cutting beef:




The weights, percentages and values given here are the average per head for the lot of five steers.

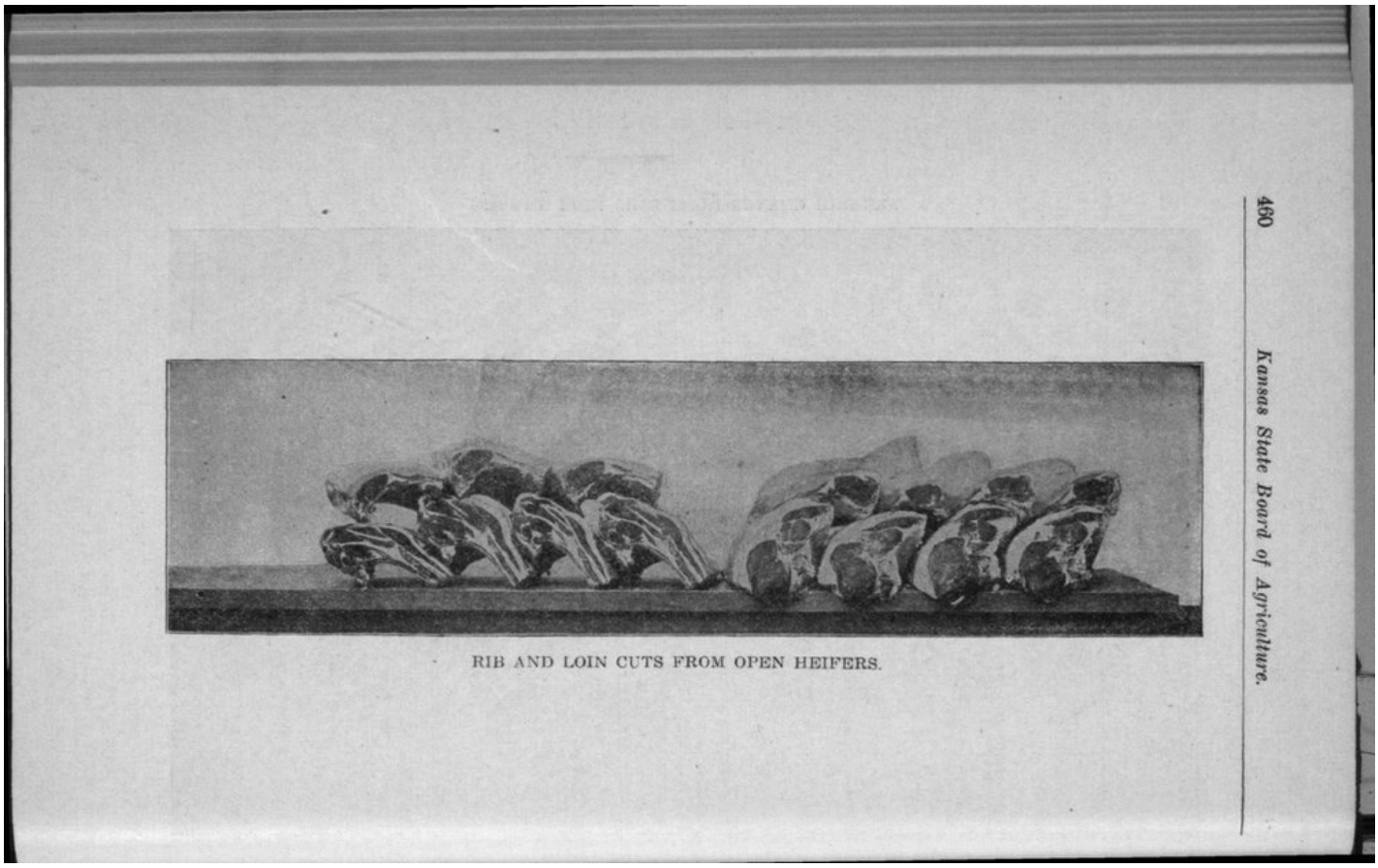
The records made on the block are presented in the following illustrations and table. The illustrations are the reproductions of photographs of the rib and loin cuts from each lot. The rib cuts are shown on the left and the loin on the right. The position of these cuts is reversed in the upper layer, thus giving a view of each end.



RIB AND LOIN CUTS FROM STEERS.



RIB AND LOIN CUTS FROM SPAYED HEIFERS.



RIB AND LOIN CUTS FROM OPEN HEIFERS.

BLOCK TEST—FIVE STEERS.

| Pieces. | Percentage of carcass. | Lbs. | Price. | Amount. |
|---|---|---|---|---|
| 10 Loins | 17.60 | 766 | 12 | $91 92 |
| 10 Ribs | 10.13 | 441 | 12 | 52 92 |
| 10 Chucks | 18.73 | 815 | 4¾ | 38 71 |
| 10 Rounds | 22.40 | 975 | 6 | 58 50 |
| 10 Plates | 16.94 | 737 | 3¼ | 23 95 |
| 10 Flanks | 3.31 | 144 | 3¼ | 4 68 |
| 10 Shanks | 5.83 | 254 | 3¼ | 8 26 |
| 10 Necks | .69 | 30 | 1 | 30 |
| Suet | 4.37 | 190 | 4 | 7 60 |
| Totals | 100.00 | 4,352 | .... | $286 84 |

Average cost price, 6.51 cents per pound.
Average selling price, 6.59 cents per pound.

FIVE SPAYED HEIFERS.

| Pieces. | Percentage of carcass. | Lbs. | Price. | Amount. |
|---|---|---|---|---|
| 10 Loins | 18.33 | 755 | 11 | $83 05 |
| 10 Ribs | 10.66 | 439 | 11 | 48 29 |
| 10 Chucks | 17.99 | 741 | 4½ | 33 34 |
| 10 Rounds | 21.73 | 895 | 5¾ | 51 46 |
| 10 Plates | 16.68 | 687 | 3¼ | 22 33 |
| 10 Flanks | 3.93 | 162 | 3¼ | 5 26 |
| 10 Shanks | 5.31 | 219 | 3¼ | 7 12 |
| 10 Necks | .73 | 30 | 1 | 30 |
| Suet | 4.64 | 191 | 4 | 7 64 |
| Totals | 100.00 | 4,119 | .... | $258 79 |

Average cost price, 6.21 cents per pound.
Average selling price, 6.26 cents per pound.

FOUR OPEN HEIFERS.

| Pieces. | Percentage of carcass. | Lbs. | Price. | Amount. |
|---|---|---|---|---|
| 8 Loins | 18.34 | 620 | 11 | $68 20 |
| 8 Ribs | 10.53 | 356 | 11 | 39 16 |
| 8 Chucks | 17.66 | 597 | 4½ | 26 87 |
| 8 Rounds | 20.57 | 695 | 5¾ | 39 96 |
| 8 Plates | 17.93 | 606 | 3¼ | 19 69 |
| 8 Flanks | 4.44 | 150 | 3¼ | 4 88 |
| 8 Shanks | 5.38 | 182 | 3¼ | 5 91 |
| 8 Necks | .71 | 24 | 1 | 24 |
| Suet | 4.44 | 150 | 4 | 6 00 |
| Totals | 100.00 | 3,380 | .... | $210 91 |

Average cost price, 6.14 cents per pound.
Average selling price, 6.24 cents per pound.

It will be observed from the block test that the percentage of weight found in the highest-priced cuts, ribs and loins, averages greater in both lot of heifers than in the steers. The same result was noted in the former comparison of steers and heifers on the block reported in Bulletin 24, and the difference was even greater there than in this case. In January of 1892, this station marketed a car-load of heavy, well-fattened steers, of which Swift & Co. said: "We have never cut up a load of cattle that were better than this load, taken all together." (Bulletin 20). We find that the heifers in this experiment also average nearly 1 per cent. more weight in rib and loin than those steers. These facts are of striking significance, for they indicate

that heifers are inclined to put rather more of their weight into the high-selling parts than steers, and, in consequence, kill more profitably. A variation of 1 per cent. at first thought seems small, but it is 1 in 17; and that, considered independently, is nearly 6 per cent., and when it is remembered that the price of this product is about three times the average for the whole carcass, a comparatively slight variation assumes considerable importance.

It will be seen by referring to the values put on the meat in the block test, that the ribs and loins from the steers were rated 1 cent per pound higher than the same cuts from the heifers, and the chucks and rounds were rated one-fourth of a cent higher. In our former comparison of these products, a uniform distinction of 1½ cents a pound was made by Swift & Co. in favor of the steer beef on ribs, loins, and plates, and one-fourth of a cent on rounds. At that time the judgment of leading English and American meat dealers was obtained. The opinion of the American dealers sustained Swift & Co in discriminating against the heifer beef to the extent named, while the difference made by the English authorities was fully as much in favor of the heifers. (See Bulletin 24). The marked difference in the estimate put on the value of steer and heifer beef in the American and English markets at that time is hard to account for. It seems evident, however, that the value of well-finished heifer beef has not been fully appreciated by American butchers. The difference in live-weight value has already been reduced from $1 to 25 cents per hundred since December, 1893, and yet the heifers have in both cases returned a higher net profit on the block than the steers, even when the higher rating of the steer meat is allowed.

The opinion of American dealers appears to be rapidly changing in reference to the relative value of steer and heifer beef. In December, 1893, when the first lot of steers and heifers was marketed by this station, the verdict of the Chicago authorities was almost unanimously in favor of sustaining the marked discrimination against the heifer. The present attitude of the market is indicated by a paragraph which appeared some time since in Clay, Robinson & Co.'s "Live-Stock Report," of Chicago:

"Even yet the heifers are too cheap in proportion, but the circumstances are forcing them into favor. The English butchers prefer the heifer, and pay the price. They found out the value of quality in their cuts sooner than we did, but we are following fast in their steps."

It has been claimed that the principal cuts in heifer carcasses run more to fat than in steers, and are, in consequence, less profitable to the consumer. The evidence of the camera is furnished on this point in the illustrations on another page, and, as will be observed, very little difference is apparent.

One distinction that has been noted in this and other investigations of the subject is, that under similar conditions the heifers are inclined to take on flesh a little more readily than steers. This distinction is not so likely to be manifest in larger gains on the heifers as in a tendency to finish at a little earlier stage in the process of fattening. This difference has also been noted by practical feeders where heifers and steers have been fed under uniform conditions on an extensive scale.

The results of this experiment fully confirm the indications of the former work at this station, viz.: that the merits and relative value of heifer beef have been underestimated in the Chicago market. The conditions surrounding this experiment have been more satisfactory than in the former, for the reasons stated in giving the details, and the results in the latter investigation point even more strongly than in the former to the excellence of well-fatted

heifers for the block. The difference in live-weight value was reduced to only 25 cents per hundred-weight in the latter case, but when the heifers make a better record both on the block and in the slaughter test, and no essential difference can be detected in the quality of the product, it is difficult to understand why there should be any distinction whatever in favor of the steers.

## SUMMARY OF RESULTS.

The operation of spaying temporarily retarded the growth of heifers 18 months of age, but heifers a year younger were not perceptibly interrupted.

The heifers in the first experiment were at a disadvantage on account of some of them having gotten in calf previous to purchase by the station. The cost of feed per pound of gain was 5.86 cents by the spayed heifers, 6.04 cents by the open heifers, and 5.02 cents by the steers.

The cost of feed per pound of gain in this experiment was 3.88 cents by the spayed heifers, 3.47 cents by the open heifers, and 3.90 cents by the steers. The former experiment covered a period of 11 months' feeding, and the latter 14 months. In the former experiment, the average daily gains for the total period were, spayed heifers, 2.07 pounds; open heifers, 1.99 pounds, steers, 2.44 pounds. In the latter experiment, the gains were, spayed heifers, 1.70 pounds; open heifers, 1.86; steers, 1.71 pounds. The lighter gains in the latter case were due to the fact that younger cattle were used, and also to unfavorable pasture conditions.

In the last experiment, where conditions were more nearly equal, the heifers made a slightly greater average gain, from correspondingly less feed, and at less cost, than the steers.

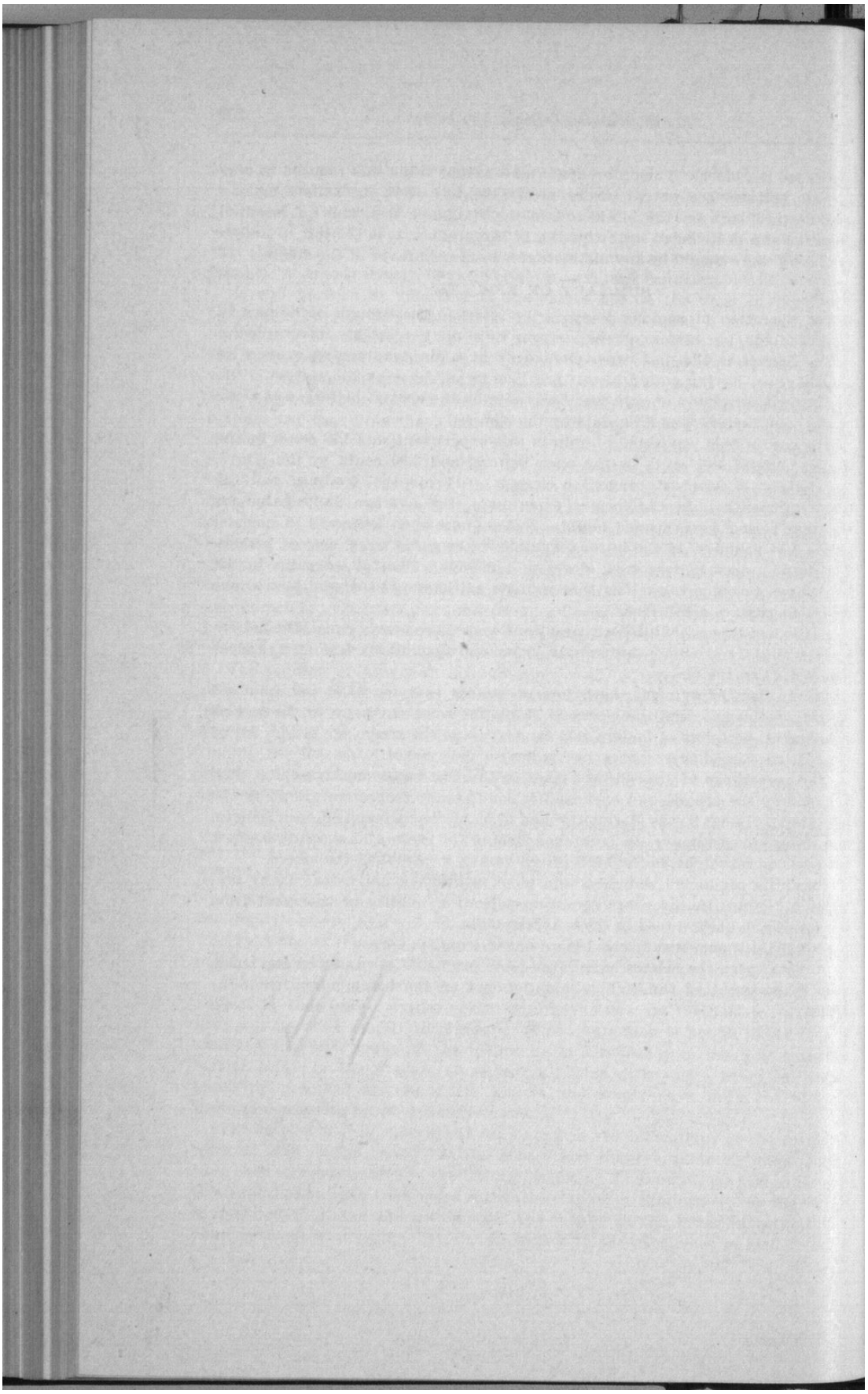
In the first experiment, both lots of heifers sold for $4.75 per hundred weight, in Chicago, and the steers $5.75, on the same market. In the second experiment, both lots of heifers sold for $4.25, and the steers for $4.50. All of these cattle topped their respective classes on the market.

The percentage of dressed beef made in the first experiment was 62.8, 62.4, and 63.2 by the spayed and open heifers, and steers, respectively; and in the second experiment it was 67.47, 68.59, and 67.05 by the spayed and open heifers, and steers, respectively. In both experiments the heifers have made about 1 per cent. more weight, in the high-priced cuts of meats, than the steers.

Carefully conducted slaughter and block tests have not revealed any material difference in the character, composition, or quality of the meat from the steers and heifers used in these experiments.

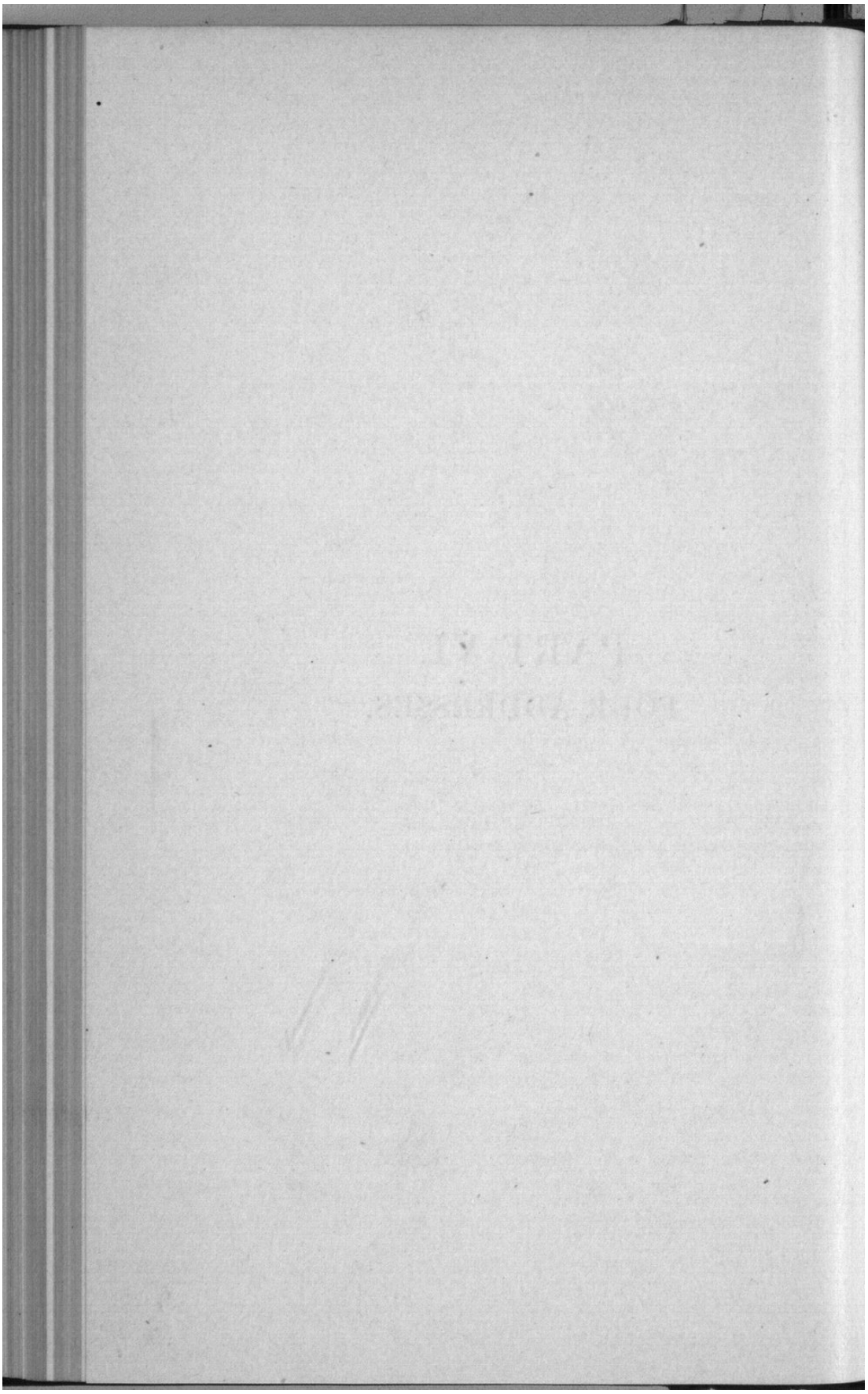
But little if any benefit has been derived from spaying.

In both cases, the heifers have given more profitable carcasses on the block, even when granting the higher valuation put on the leading cuts from the steers.



# PART VI.

## FOUR ADDRESSES.



# FOUR ADDRESSES

## DELIVERED AT THE TWENTY-FIFTH ANNUAL MEETING OF THE KANSAS STATE BOARD OF AGRICULTURE, JANUARY 8–10, 1896.

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### KANSAS—HER FARMERS AND PROSPERITY.

Ex-Lieut.-Gov. A. J. Felt, Atchison.

To speak of the farm in Kansas is to speak of the state herself. This, of all American states, is the child of the farm, the fireside, the home. Prosperity for the farmer is advancement for all. Bankruptcy for the farm brings distress to all.

We are proud of Kansas, because of her homes. Her broad acreage, her great system of railways, her flourishing mines and her many manufacturing industries are subjects for our pride, but the real wealth of Kansas is the creation of the labor of her agriculturists and the steady response of her generous soil. We may well be proud of our beautiful cities and thriving towns, but the real pillar of our strength lies in the homes upon our prairies, where the wand of labor has transformed more square miles than all of England and Ireland into fields of grain, grass, and growing herds. With the accustomed modesty of the typical Kansan, I do not hesitate to say that the farmers of Kansas have accomplished more in 30 years than their forefathers did in a century, and they are not afraid to say so, and prove it by the records. A state is not her square miles of land. The homes of the people are the state. Trouble and distress in the homes signify trouble and loss for the commonwealth. Prosperity is, in one sense, the best antidote for sin. Poverty is the parent of crime. The poverty-stricken family with sunshine on their faces and Christianity in their hearts is the abiding place of angels unseen, and of forces unknown to those to whom real abiding sorrow is a stranger, and where want never comes.

The agricultural interests in the United States are greater than any other. They ought to be united, prosperous, and progressive. What is true of the nation as a unit is equally true of Kansas as one of its component parts. Is the nation prosperous? Is Kansas prosperous? These question are too solemn to be asked in a spirit of wantonness or to be answered with levity. Did you ever observe or have you ever read of a time when the farmers of the United States were prosperous that the entire business world was not healthful and happy? Did you ever know or hear of a period when the farmers were not prosperous that the merchant was not complaining, the manufacturer closing his factory, and the bankers, the railways, the steamship lines and the

wage-earners were not sufferers? There is no hesitation on my part in saying to you that I approach the boundary line of advice to farmers with extreme diffidence. It is not for me to give advice to them, for they have had practical experience in Kansas farming while I have not; but a few general suggestions are ventured, not to farmers as a class, but as citizens. My slight experience on a farm was in my early manhood in the state of New York, where 60 acres of farm in the valley were made to clothe and feed the family and educate the children. My opinion is that 60 acres of valley land in Kansas will produce more grain and vegetables and as much tame grass and fruit as those 60 acres in New York. But it must be more than half farmed. The "stuff" saved and utilized makes wealth. The same "stuff" wasted brings poverty. There has been sufficient waste, absolute, wilful waste, of rough feed, fruit, farm machinery, fertilizers, vegetables, etc., in the eight counties of the first congressional district of Kansas every five years during the past three decades to have paid every dollar of farm indebtedness in that district. I speak of that locality because familiar with it; but what is true there is, I fear, true in every district in Kansas. The eight counties I have mentioned are as good and the people as prosperous as those of any eight counties districted together in Kansas or Missouri. Sometimes people acquire a competence in spite of their wastefulness, but they are far more apt to become the victims of poverty.

Poverty is always a misfortune—not only to the individuals but to society. No citizen can lose the result of labor or production without inflicting a loss upon the neighborhood of which he is a part. Poverty resulting from waste, indolence or vicious habits is worse than a misfortune. It is a crime. The wastes of society are almost incalculable in money value. There can be no doubt of the truth of the maxim that "A penny saved is a penny earned." If I were to amend the proverb, I would say that $1 saved is the equal of $10 earned. I am anxious to note the difference between the man who saves and the penurious or stingy man. It is a virtue to be saving and prudent. It is a serious fault to be selfish, mean, and stingy. We are too apt to blame others for the faults peculiarly our own. Prudence is the real foundation of prosperity for the farmer as well as the merchant or banker. The reckless merchant dies a bankrupt. The reckless banker is a criminal. Ought not the farmer to be as prudent as others? We have bought too much and saved too little. Credit has come to us in the garb of a friend and has proven our worst enemy. To borrow an uncouth Missouri phrase, "He bit off more than he could masticate." This applies to me, to some of you, and to many more who will never read these words. If we had exercised half as much care to keep out of debt as we have to get into it, we should be in a much better condition to-day. We cannot live upon the mortgages we have given, nor fatten upon the interest we pay. The most of us crossed the Mississippi or the Missouri with no money, but with a vast wealth of hope and courage. Had we been content to live upon what we earned and saved we should be the most independent people on earth.

Haste to get rich has made us borrowers, and the borrower has made booms, and booms made men wild, and Kansas became a vast insane ayslum covering over 80,000 square miles. Allah be praised, the season of insanity is over! Common sense has returned and become a resident of Kansas. We had our spree, our delusions, our headaches, our heart-breaks, our convalescence. We are badly disfigured but still on earth. We have learned something. The man who is whipped knows more than the other fellow. He has

had more fateful experience. We had too much credit, and abused it. We borrowed too much money and wasted it. We flew too high, and fell in hard spots. We have learned what all the world has known for a thousand years: that wealth is the creation of the land when touched by the wand of labor. Speculation never coined an honest dollar and booms never declared permanent dividends. "The corn, wine and oil" are the products of thrift and industry. We have had a tough time. It has been a rough and rugged road. It is time now to let the other fellow do the walking. How shall we make the change? No outside force plunged us into the depths. We walked in of our own free will and accord. No outsider can force a Kansan to do anything; but when the Kansas man saw fit to become rich in 90 days he did so, and when the boom broke and he found himself at the bottom of the well he kept his eye on the sunshine dimly visible above him. He will yet climb to the stars, but he will find them close to his own broad acres, and not beyond the skies. We have had poetry enough to last for a thousand years. We have learned that one brood-mare will do more to lift the mortgage than all the lofty flights of Pegasus.

We know now that resolutions will not pay debts, and that partizan platforms will not clothe the children. The age of buncombe has passed. We can resolve that we are rich, and die paupers. We can make laws that promise to aid the poor, but no statutory enactment can discharge the duties of good citizenship. Personal honor must be preserved at all hazards. Men cannot be made better by legislative enactment. The statute that puts money in the purse of the few takes it from the pockets of the many. Crop failures are incidents in farm experience, but thrift, perserverance, industry, are the children of faith, born and nurtured at the family fireside. Kansas was the first-born child of that strong patriotic faith which believed that God's acres were for the use of men and not for the owners of men. Kansas is the American-manhood state. The fellow who does not believe that the American farmer is the best farmer on earth has no business here. We do too much resolving and figuring at times. The farmer who resolves that he is ruined is the architect of his own misfortune. He who figures from morning until night to show that private and municipal debts are greater than the property is worth is multiplying despair. Let us pause to count our blessings. They are manifold. Why stop to count the weeds and not measure the corn? There is more wealth in the grace of a sunshiny temper than in the wry face of gloomy discontent.

Kansas is not in need of more water so much as she is in need of saving and using what she has. I am not going to talk about irrigation, only to say that if the government of the United States will use as much effort during the next 10 years to advance the interests of the farmers of Kansas, Colorado and Nebraska as it has during the past 20 years to please the stock-gamblers along the Atlantic seaboard, there will be more farm produce raised in the western dry belt of Kansas between now and 1906 than has been grown in all New England for 20 years. There is a West; it is time this fact is understood and recognized at Washington. Kansas is no longer a border state. Her broad bosom holds the heart of the American republic. "Time's noblest opportunity is the last," and we are "the heirs of all the ages in the files of time," for ours is the last land to be occupied in this latitude. But our geographical position is not our strong fortress. The farmer must be a potential factor in establishing the market for his products. The more good and

prosperous people there are to feed and clothe the better for the farmer. The United States is now the home of a large portion of the Anglo-Saxon race. That race will conquer the world. The better the blood the better the food it requires. Every "feeder" on the farm knows this. The rule applies to men as well. We must Americanize the United States. It is time to say, "This is no place for the scum of Asia or southern Europe. It is time to think more of that American home spirit which bred our Washingtons and Lincolns, and chop off that foreign idea that bends and bows to the Rothschilds of Europe.

We are told that we have reached the period when $1 a day for labor and a mere living price for farm produce must endure forever. I do not believe it. That is an European condition. Low prices go with scarce money. Cheap corn and wheat make cheap men. Prices go down but taxes go up. Farm products are cheapened but the debts are not lessened. That is not an American but a European condition. We want no more of it. This is not the hour to talk partizanship, but I know of no place or occasion under the folds of "Old Glory" too sacred to talk patriotism. This is a critical period in the history of American agriculture and American business. The farmers of Kansas are bearing their full share of the burden. There can be no return of prosperity to Kansas as a state until prosperity abides with Kansas farmers. My own opinion is that such prosperity will not return until the American idea controls the United States. The only safe policy is the patriotic policy. Congress has no right to legislate for any interests but American prosperity. The President has no right to ask the consent of any foreign potentate when called upon to decide American questions. The secretary of the treasury has no right to guide his financial policy to please alien mortgage and bondholders or a bankers' syndicate in Wall street. If there were no farmers there would be no flag symbolizing human liberty. If there were no farmers there would be no public treasury. If there were no farmers there would be but little of that patrotic inspiration which made Valley Forge a possible American glory. It is time to dissolve the partnership between the federal treasury and the Shylocks of Europe. It is time to say that the mines of Colorado, Utah, Wyoming and New Mexico need as much paternal care from Uncle Sam as the coal and iron mines of Ohio and Pennsylvania or the forests of Michigan and Maine. It is time to declare that the farmer of Kansas has as much right to demand a hearing at Washington as has the man in New England who lives upon the interest paid by Kansas toil. Citizenship makes the state. The most humble farm home on the bleakest Kansas prairie to-night has as much to do in the making of that citizenship as the finest home in Topeka. There is something wrong when all progress is blocked because the onward march of agriculture has made a halt. Let us turn over a new leaf this year by giving more patient hearing to these problems now knocking gently at our door, but which, if cemented and aroused, will make what is now a friend become a menace. Wild socialism and wilder anarchy are at our door. They are not American—they are European products, dangerous to the farmer, the wage-earner, and to every home. Let us have faith. Let us remember the words of the Psalmist, "Once I was young—now I am old—but I have never seen the righteous forsaken or his seed begging for bread." I have no patience with those who seek to array the farm against the town. Their interests are one. When one prospers the other grows. The farm is the corner-stone of the state as the home is the

keeper of its heart and conscience. Faith and courage—we all need them both.

The home life is the real source of power in the state. Life ought to be something more than a mere struggle for bread. It is safe to say that 90 per cent. of all the farmers who have come to Kansas from other states came without surplus wealth—came to better their conditions. As a rule they represent, in enterprise, thrift, and industry, the highest average of American agriculturists. The total population of Kansas—the farm population—is about in the ratio of 10 to 3 of all other inhabitants, so that in point of numbers the farmers ought to look out for themselves in the struggle. Wealth is not the true measure of the real valuation of humanity, but it is, in a large degree, the measure of public prosperity. Any boat can move down with the current, but it is the wise captain and brave crew who make the ship overcome the repellent waves and outride the storm.

I believe in prosperity. Work earns a reward, and it ought to enjoy it. The manufacturer says what you shall pay for his goods. The banker says what you shall pay for exchange. To that I do not object; but I do say that the Kansas farmer should urge that the market should come as near to Kansas soil as possible, and that the price of his products shall not be governed by those whose profits are greatest when the margins for the farmer are the least. The home is the hope of the republic. The farmer's ought to be the best and brightest in the land. There can be no real home where there is no hope, no confidence, no faith. We look to outer life too much and to our inner life too little. If we are poor in spirit, all the crops of the most bountiful harvests cannot make us happy. We look down too much, and forget the blessings of to-day while counting the sorrows of yesterday.

Kansas is not poor; she is rich. A state whose population has gone from 107,206 in 1860 to 1,334,734 in 1895 is not poor, and cannot be made poor save by her own people. Of that population nearly one million dwell outside of the ninety-five towns and cities having over 1,000 population. Our increase in population since 1887 is 45 per cent.; increase in acreage of winter wheat, over 200 per cent.; increase in acreage of corn, 50 per cent.; increase in acreage of tame grass, 120 per cent.; increase of acreage of all field crops, over 100 per cent. Kansas cannot be poor when in 35 years she has built 5,000 churches, at a cost of $6,000,000. Kansas is not poor; she pays less than $120,000 to support paupers; but she has built in 35 years 8,000 public schoolhouses and owns $9,000,000 worth of public-school property. No people can be poverty-stricken whose homes have $2,000,000 in private libraries, and where more magazines and newspapers are read at the farmers' fireside than under any other sky. Kansas farmers had, in 1895, including grass lands fenced, 21,576,704 acres in cultivation. The total production was $128,503,792. Add to this $73,000,000 in live stock, showing an average of about $9 per acre, including nearly six million acres in prairie grass. Let us pause to count our blessings. Let us glory in our achievements and not mourn for our losses. Our great university, normal and agricultural colleges; our great benevolent institutions; this splendid capitol where we meet to-night, are the unanswerable proof that the prosperity of Kansas is in the growth of her farms, and the abiding success of the brave men and patient women who have made the farm a home, and from the homes have builded a state.

Only the secret archives of God's recording angel can reveal the secret, patient, long-suffering, heroic struggle of the brave and loyal wives and mothers who have presided as ministering angels at the homes and firesides

on the plains of Kansas. When man has become impatient, weary, and ready to surrender, her patriotic fortitude has taught him to "Hold the fort." How she has inspired him with the lofty spirit of Margaret E. Sangster's beautiful poem, "Don't Fret, but Smile":

"It is n't worth while to fret, dear,
To walk as behind a hearse,
No matter how vexing things may be,
They easily might be worse;
And the time you spend complaining
And groaning about the load,
Better be given to going on,
And pressing along the road.

"I've trodden the hill myself, dear—
'Tis the tripping tongue can preach;
But though silence is sometimes golden, child,
As oft there is grace in speech;
And I see, from my higher level,
'Tis less the path than the pace
That wearies the back and dims the eye,
And writes the lines on the face.

"There are vexing cares enough, dear,
And to spare, when all is told;
And love must mourn its losses,
And the cheeks' soft bloom grow old;
But the spell of the craven spirit
Turns blessing into curse,
While the bold heart meets the trouble
That easily might be worse.

"So smile at each disaster
That will presently pass away,
And believe a bright to-morrow
Will follow the dark to-day.
There's nothing gained by fretting;
Gather your strength anew,
And step by step go onward, dear,
Let the skies be gray or blue."

Now is the time to hang on. The farms made Kansas great in the past; they will make her more grand in the future.

## OBSERVATIONS ON EUROPEAN AGRICULTURE.

By Pres. Geo. T. Fairchild, State Agricultural College.

It is proper to explain, in brief, the occasion of my presenting to-night these imperfect notes upon so large a subject. When about to enter upon a two months' tour in Europe for personal health, pleasure, and information, I received from your vigilant Secretary a commission, duly signed, and sealed with a golden seal, to investigate "the agricultural and horticultural methods, productions and markets of the countries visited, and especially such aspects of them as may have a bearing upon or afford useful suggestions along similar lines in our own country," with a special request that I give "at least the substance of observations and conclusions in an address before this Board at its annual meeting in January, 1896." In fulfillment of that commission I am here, and only wish I could do as much honor to the commission as the commission does to me.

The time of my visit on the other side of the Atlantic occupied exactly eight weeks, three-fifths of which was spent in those great cities of the old world where the treasures of ancient and medieval art and learning, as well as the chief results of modern civilization, are a perpetual attraction, and another fifth in those grand monuments to picturesque nature which have made Switzerland the resort of the world. Ten days of rapid travel, with the use of eyes and ears along the way, must be the basis of these observations.

Let me first give you, as distinctly as I can, a brief outline of the successive views in this journey, and then a concise statement of constrasts with our own agriculture, followed by some suggestions as to our relations to foreign markets. In this I shall try to be simply your witness, telling the truth, all I can of the truth, and nothing but the truth, of scenes and facts under my notice.

### SCOTLAND.

In a hurried trip from Liverpool to Glasgow, through the county of Ayr, then through the Highlands by way of Loch Lomond and Loch Katrine to Edinburgh, and southeast through Melrose to Newcastle-upon-Tyne, I gained a series of pictures never to be lost.

In the region about Glasgow an unprecedented drought had rendered the growing crops of wheat, oats and barley exceedingly thin, and the most noticeable features were the stone-walled pastures filled with the typical Ayrshire cattle—a dairy breed little known in this state, but noted in New England—medium-sized, alert, with erect horns, and spotted in every conceivable combination of big and little spots. In the edge of the Highlands farming seems at first glance confined to mere garden spots tucked in among the rugged hills and along the borders of the winding lakes; but a closer scrutiny shows the heather-covered hills, rising into mountains, almost, to be filled on every side with the black-faced heath sheep. This is a breed of long, rather thin-wooled, medium-sized mutton sheep, all having horns of striking proportions, and the flavor of the flesh approaching that of venison. They climb like goats, and their answering bleats fill the valleys with the music of thrift, where otherwise there would seem to be desolation. The most of the cattle seen about the hamlets visited were Ayrshires still, but I

saw one herd of the native Highland cattle, a rugged, hairy, black and dun-colored breed, with spreading, upright horns, reminding one of a Texas steer without his rangy frame.

About Edinburgh and toward the south the farming seemed more thrifty and the crop prospects better. Herds of beef cattle, Polled Angus, and occasionally Galloways, with more noticeable farm buildings, and well-protected stacks and ingenious stack-covers of corrugated iron, were seen. Some extensive estates showed a prosperous culture, and hawthorn hedges and ivy-clad walls began to appear. Scotch energy was apparent in the absence of weeds and in the well-built roads. Of farm machinery I saw almost nothing. In Edinburgh I visited the university laboratory of agricultural chemistry with interest, though its facilities for work were far from being ideal. A few students only were accommodated.

ENGLAND.

A zigzag journey from Newcastle-upon-Tyne, through Durham, York, Sheffield, Birmingham, and Oxford, to London; a trip west of London to Gloucestershire, and another south to New Haven; and another zigzag journey from Harwick, on the east coast, to Liverpool on the west, gave me never-to-be-forgotten views of merry England, with its beautiful hawthorn hedges, trimmed to precision; its permanent pastures so carefully protected as to maintain their verdure for centuries; its thoroughly tilled fields of roots, grains, vetches, rape, and millet, but no corn. Intensive farming has its fullest exhibition in some parts of England, and the variety of crops, evidently in careful rotation, with the universal attendants of beef cattle and mutton sheep, show that mixed farming is the rule and not, as with us, the exception.

Most noticeable to a western man is the extensive provision of hedges and walls. Farms are evidently divided into permanent fields of small dimensions, and toward the highway especially the close hedge, or often a high stone wall topped with broken bottles set in mortar, reminds you that common law makes the Englishman's house his castle, and its immediate surroundings seem fortified, too.

Of course there are extensive parks on ducal estates, through which you may drive for miles, with well-kept forests stocked with deer, hares, pheasants, and foxes, where magnificent palaces surrounded by extensive stables for hunters and racers and unlimited kennels for hounds show the cultivation of royal sport; but in close proximity are the multitudes of rented farms, with somewhat rude buildings and closely crowded farmyard. To a stranger the cottages with rough stone walls and thatch, often overgrown with moss, suggest poverty; but the gardens bursting with roses in every variety of richness suggest taste and culture and home loving that mean a genuine welfare.

There are exceptions to such high culture. Along the eastern coast, for instance, extensive tracts of grass land, rough as our rolling high prairie, unfenced and untilled, are given up to sheep farming. Occasional stone corrals, scattered flocks, and a peculiar way of furrowing the hillsides to prevent washing, are the only signs of agriculture for miles on miles. So in the south, chalk cliffs and chalky hilltops show almost barrenness.

My journey to Gloucestershire was for the purpose of visiting the Royal Agricultural College at Cirencester (pronounced Sisseter). Here I found seemingly the thriftiest part of England, in many respects. The crops were the best seen, the farms and farmers looked most cheerful, and the general

sentiment seemed brightest. Perhaps the celebration of the jubilee of the Royal College had its effect upon appearances. I found the college prettily located upon a farm of moderate size, the greater part of the land attached being rented as a horse-raising and sheep-breeding establishment. Its principal building, erected just 50 years ago, is of pleasing outlines, resembling a modern castle. It has a small dairy house—at which lives the bailiff, who manages the farm—a moderate dairy barn, a little shop, and a veterinary stable. In the main building are all the classrooms, laboratories, museums, library, and dormitories, as well as boarding facilities for the 78 students in attendance—"all sons of gentlemen," as the bailiff informed me with enthusiasm. The son of a gentleman in England is one to whom the thought of earning a living by the sweat of his face has never come. It he works, it is for the honor of his paternal estate, and most often he plays till the burden of a landlord's responsibility is laid upon him by inheritance. The Royal Agricultural College of England, under the special patronage of his royal highness the Prince of Wales, was established for the training of sons of gentlemen in management of estates. Although its equipment strikes one as deficient in most of the requisites for scientific training, it is under good management, and has served its purpose well. Its patrons and alumni might well celebrate the jubilee of its existence with loud acclaim.

I saw there an excellent sample flock of mutton sheep, in which I counted nine distinct types or breeds. The dairy herd had typical specimens of Shorthorn, red-polled Ayrshire, Jersey, Guernsey and Kerry cattle. A few experimental plats of grain and roots were shown; but an annual visit to the farm of Sir John Lawes, at Rothamstead, gives the chief lessons in experiment. The bailiff explained, as he turned the key in the padlocked gate, that the young gentlemen could not be expected to take much interest in such things, and it would be a capital joke to some of them to turn the whole herd into the experimental grain-field. Comparing this royal college of 78 gentlemen's sons with our own college of 650 sons and daughters of Kansas yeoman, I could not but give the preference to ours.

It was my privilege here to visit the typical agricultural show for the county. Too late to see the great show of the Royal Agricultural Society, famed over the world, I was glad to avail myself of a glance at this smaller display.

The show was held in the magnificent park of the right honorable Earl Bathurst, who presided, and was attended by his royal highness the Prince of Wales, who was also an exhibitor, and there were over 560 entries of all sorts. The first prizes for horses and cattle were £10, or $50, and for sheep half as much. For horses there were over 250 entries, embracing draft-horses, hunters, hacks, and ponies, and jumping and driving horses. Among the draft-horses were the finest specimens of the Shire horse I have seen anywhere, and the "hunters" carried the palm over any saddle-horses seen elsewhere. Gloucestershire is noted for its fox-hunting, and some of the finest stables and kennels in the land are there. It was my fortune to journey through the county with an ex-keeper of the hounds for Earl Bathurst, who pointed out a dozen places along the way where he had been "in at the death" of a fox.

Among cattle, Shorthorns took the lead with 90 entries, and excellent specimens, though none better than our own state can offer. It was noticeable that the favorites were quite as often roans as reds; all the prizes for bull

calves, I think, were taken by roans. Herefords were few in number, but of excellent quality, and Jerseys in larger numbers appeared most true to their type.

Sheep in pens, and in flocks of fat wethers, were of the mutton breeds that have made England famous—Cotswolds, Southdowns, Shropshires, Oxfordshires and Hampshires—and worthy of the prizes won.

Most interesting was the dairy exhibit, with its prizes for butter, where 17 dairymaids entered into competition, six of them trained in the traveling dairy school of the county council.

In farm implements the show seemed deficient, judged by our standards, except in dairy tools and root choppers. Of farm produce, other than live stock and dairy products, there was none. It gave a good opportunity to study the English farming classes, for everybody was there. The visit of the prince had made the occasion a gala day, and flags in countless thousands decorated the mile and a half of road from station to park and filled the streets of the town. Merry England was at her best in everything that day.

Returning to London, I was barely in time to catch the last end of a meeting of the Royal Horticultural Society for the display of fruits and flowers. Although the glance was brief, I was able to agree that the display of roses there, as everywhere in England, exceeded expectations. In small fruits there was every reason to be pleased. The strawberries of England, in size, flavor, and texture, are simply superb; the cherries have a richness found in this continent only in California; but the gooseberries surpass all comparisons. I brought away with me for study 20 different varieties, the smallest of which was a full inch in diameter and the largest nearer two inches. In color they varied from a rich, dark red, through golden yellow and olive, to a beautiful green. In flavor they had as distinct and as pleasing characteristics as cherries. The five in my collection pronounced most excellent were named Stockwell, Drill, Beauty, Lord Audley, and Mt. Pleasant.

A day at Kew gardens, in the suburbs of London, as touching the development of acquaintance with plant growth, must not be overlooked. They are a once royal estate, long since given up to the acclimation and cultivation of every known species of plant, shrub, or tree, together with extensive herbariums and museums, moderate laboratories, and a considerable library of botanical literature. There you can see a finer specimen of the cedar of Lebanon than the mountains of Lebanon can furnish, though scarcely so old. A palm house 70 feet high and 250 feet long presents a fair semblance to a tropical forest. This garden is maintained at an annual expense of about $130,000.

In London are the headquarters of the great Royal Horticultural Society, of world-wide fame for its shows, its meetings, and its publications, and also the Central Chambers of Agriculture, having 62 subordinate chambers in as many different parts of the kingdom. These I was unable to spend time upon, knowing that the publications of these great societies give a better idea of their work than any mere description of an outsider. It was with sincere regret that I was compelled to forego an expected visit to the estate of Sir John Lawes, at Rothamstead. Having had correspondence for years with the head of this most noted experiment station, and having met personally Doctor Gilbert, of equal fame, I anticipated much profit from a visit there. But a serious illness of one of our party prevented my absence for the day set apart for this purpose.

To the south of London a somewhat less intensive farming appeared, and the cattle seemed less uniform. Near the channel black horned cattle were seen in considerable numbers, seeming to be a distinct breed. In several instances these were seen as work oxen attached to a huge plow whose beam was carried upon two high wheels attached just back of the clevis.

Then general range of enterprise in farming in England seemed quite as varied as in our own country, with greater tendency to uniformity throughout considerable regions as to crops and stock. Farm implements seemed far less developed than here, and marked frequently by local characteristics, distinguishing one county from another.

A most notable peculiarity was the clear separation between landlords (or owners), farmers (or renters), and farm laborers. Each is so distinct as to have entirely different interests and to figure in politics with different wants and remedies. The landlord worries over declining rent and increasing taxes. The farmer worries over delayed improvements and low prices of products. The laborer frets over lowering wages and uncertainty of employment. A statement made to me by a thrifty farmer in Gloucestershire, who thought the laborers had no cause of complaint, may be taken as above the average of wages. Shepherds had, he said, fourteen shillings ($3.50) a week, with cottage and potato patch, and a gift of a pound ($5) at lambing time and another pound at shearing, equal to about $190 a year and house rent. A teamster, or carter, receives from ten to thirteen shillings a week, with gifts of a pound at haying, a pound at harvest, and a shilling a load for grain hauled to market, or from $140 to $175 a year, with house rent. These are skilled laborers, who spend their life in the business and raise families to succeed them. These wages my farmer acquaintance thought too high for the ruling prices of produce.

## FRANCE.

A trip up the valley of the Seine, and a rapid journey from Paris southeast to Geneva, cover the whole of my experience in sunny France, the land of peasant proprietors. The fertile valley of the Seine, especially from Rouen to Paris, gives a continuous series of garden-beds of cereals, roots, cabbages, forage-crops, grasses and occasional vineyards in every conceivable shape and combination. Under the bright sun of August, when harvest was just begun, the varied colors of the checkered bottom land and hillsides were well described by a lady of our party as making a perfect "crazy-quilt." These little patches of plantations, from one to two rods wide, and from 10 to 20 rods long, indicate the extreme division and subdivision of estates among members of families. In all the region no fences are visible, no stock is in sight; for all stock is kept by forage or soiling in stalls. Farm implements, beyond the rude heavy tools, chief among which appeared a heavy hoe almost like a mattock, were unseen. Hand labor is of course the universal rule—the sickle still doing good service in these little patches of grain.

At Paris the Jardin des Plantes is interesting. There, also, a visit to the minister of agriculture brought an interview—more amusing than interesting for want of acquaintance with each other's native tongue—with the chief of engineers for hydraulic agriculture, or irrigation. Through this I gained some, to me, important information upon the actual increase of profit from irrigation, which I have already communicated to our state board of irrigation, and formed an acquaintance which may continue to be of use in future correspondence.