

**TEXAS AGRICULTURAL EXPERIMENT STATION**

**AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS**

**W. B. BIZZELL, President**

**BULLETIN NO. 297**

**JULY 1922**

**DIVISION OF FARM AND RANCH ECONOMICS**

**AN ECONOMIC STUDY OF A TYPICAL RANCHING  
AREA ON THE EDWARDS PLATEAU OF TEXAS**



**B. YOUNGBLOOD, Director**

**COLLEGE STATION, BRAZOS COUNTY, TEXAS**



## CONTENTS

	Page
FOREWORD .....	15-20
<b>PART I, INTRODUCTION</b>	
<b>CHAPTER I, THE RESPECTIVE DOMAINS OF THE FARMER AND THE GRAZIER .....</b>	<b>23-32</b>
Historical Development .....	23
Area and Extent of Grazing Lands .....	30
United States .....	30
Texas .....	32
<b>CHAPTER II, RANCH ECONOMICS DEFINED .....</b>	<b>33-43</b>
Origin of the Term "Ranch" .....	33
Some Definitions .....	35
Of General Economics .....	35
Of Agricultural Economics .....	35
Of Farm Management .....	37
Relation of Farm Management to Agricultural Economics .....	38
Of Ranch Economics .....	40
The Relation of Research to the Ranchman as a Manager .....	41
The Agricultural Experiment Stations .....	42
<b>PART II, THE SURVEY PROPER</b>	
<b>CHAPTER III, THE AREA DESCRIBED .....</b>	<b>47-68</b>
Location .....	47
Topography .....	49
Altitude .....	51
Soils .....	51
Water Resources .....	51
People .....	53
Land Values .....	53
Native Animals .....	54
Livestock .....	54
Climate .....	55
Precipitation .....	55
Clear and Cloudy Days .....	58
Temperatures .....	62
Evaporation .....	62
Wind Velocity .....	63
Native Vegetation .....	64
<b>CHAPTER IV, HISTORICAL SKETCH OF RANCHING IN SUTTON COUNTY .....</b>	<b>69-78</b>
Some Historical Classifications .....	69
The Free Grass Period .....	70
Indian Times .....	70
The "Law of the Range" .....	70
The Pastoral Stage .....	71
Methods of Handling Sheep on Free Grass .....	72
The Beginnings of Permanent Ranching .....	73
The Period of the Leased Range .....	74
The Introduction of Wire Fencing .....	74
The Period of Private Ownership .....	75
The Introduction of Wolf-Proof Fences .....	76
Some Advantages of Wolf-Proof Fences .....	77
Present Tendencies .....	77

## CONTENTS

Page

<b>CHAPTER V, RANCH LANDS</b> .....	<b>79-106</b>
Land Defined .....	79
Legal Definition .....	79
Land Classification .....	80
Types of Ranch Lands .....	80
The Grades of Land .....	82
The Grades of Ranch Land .....	83
Productivity of Ranch Lands.....	83
Distance from Markets.....	84
Taxation of Ranch Lands .....	88
Land Measurement .....	89
The Area Studied .....	90
A Classification of Sutton County Ranch Lands .....	91
Amount and Function of Each Class of Land.....	92
All Lands .....	92
Cultivated Lands .....	92
Tillable Lands Still in Grass .....	95
Arable Land .....	99
Permanent, or Non-Arable, Grazing Lands .....	100
Total Grazing Lands .....	105
Conclusions .....	105
<b>CHAPTER VI, THE SIZE OF RANCHES</b> .....	<b>106-127</b>
The Ranch Unit .....	106
Size of Ranches as Measured by Investments.....	111
The History of the Size of Ranches in Sutton County .....	113
Factors Influencing the Size of Ranches .....	116
Physical Factors .....	116
Economic Factors .....	119
Political Factors .....	123
Influence of the Individual on the Size of Ranches.....	125
Conclusions as to the Size of Ranches .....	126
<b>CHAPTER VII, TENURE OF RANCH LAND</b> .....	<b>128-162</b>
Systems of Land Tenure .....	128
Ranch Land Tenure in Sutton County .....	136
Length of Tenure .....	138
Problems of Acquiring a Ranch .....	141
Land Tenure in Its Relation to Prices of Land and of Leases..	147
The Basis of Land Values .....	149
Relation of Type of Ranch Tenure to Production .....	153
Age of Ranch Operators .....	155
Principles of Ranch Selection .....	156
<b>CHAPTER VIII, THE CARRYING CAPACITY OF THE RANGES</b> .....	<b>163-227</b>
The Term "Carrying Capacity" Defined .....	163
Factors Affecting Carrying Capacity .....	169
Climate .....	169
Topography .....	169
Percentage of Turf or Covering .....	170
Effect of Variety and Quality of Cover Upon the Carrying Capacity .....	171
Supplemental Feeding .....	172
Water Distribution .....	174
The Amount and Distribution of Salt.....	175
Diversified Ranching .....	176
The Ranch Layout .....	182
Size of Ranches .....	186
The Grazing System .....	186
Managerial Skill .....	190



## CONTENTS

	Page
The Form of Tenure .....	190
Drouth .....	191
Over-Grazing .....	191
Evidences of Over-Grazing .....	192
Under-Grazing .....	193
Building Up Depleted Ranges .....	194
The Carrying Capacity of Sutton County Ranges .....	197
Types and Classes of Livestock on the Ranges .....	203
The Normal Breeding Herd or Flock .....	203
The Normal Range Herd or Flock .....	203
The Carrying Capacity Requirements of a Normal Herd or Flock .....	206
Selling Carrying Capacity Units .....	210
Time to Sell Sheep and Goats .....	219
Relative Amounts of Carrying Capacity Devoted to Different Types and Classes of Livestock .....	224
<b>CHAPTER IX, PERMANENT IMPROVEMENTS .....</b>	<b>228-255</b>
Definitions .....	228
Fence Building for Purposes of Exclusion .....	229
Period of Fence Building for Better Ranch Management .....	230
Fence Construction .....	232
Cost of Fencing .....	233
Fences as Related to Overhead Expenses .....	233
Buildings .....	237
Headquarters Houses .....	237
Other Buildings .....	239
The Water System .....	244
Cost of Water Supply .....	245
Reservoirs .....	246
Pumping Engines .....	250
Dipping Vats .....	250
Efficiency in Permanent Improvements .....	251
Relation of Permanent Improvements to Cost of Production .....	252
<b>CHAPTER X, MOVABLE CAPITAL .....</b>	<b>256-260</b>
Definitions .....	256
Amount of Movable Capital Required in Ranching .....	258
Livestock .....	258
Machinery, Implements and Tools .....	259
Miscellaneous Forms of Movable Capital .....	260
<b>CHAPTER XI, RANCH CREDITS .....</b>	<b>261-300</b>
Definitions .....	261
Types of Credit Needed .....	264
Credit on Land .....	265
Federal Land Bank Loans .....	266
Rate of Interest on Land Loans .....	268
Length of Time on Land Loans .....	268
Sources of Land Credit .....	270
Credit on Movable Capital .....	271
Livestock .....	271
Amount of Credit .....	273
Security .....	276
Diversification .....	277
Time Required .....	278
Length of Loans .....	280
Rate of Interest .....	281
Sources of Credit on Range Livestock .....	285
Cattle Loan Companies .....	285

## CONTENTS

	Page
Credit on Wool and Mohair .....	288
Credit on Ranch Machinery .....	290
Credit for Operating Expenses .....	291
Summary and Conclusions .....	292
Proposed Remedies for Faults of Present System of Ranch Credits .....	295
Essential Requirements of an Intermediate-Time Credit System .....	297
Central Discounting Institutions .....	297
Local Guarantee Associations .....	298
Regional Discount Agency .....	298
Recent Proposals for Furnishing Agricultural Intermediate-Time Credit .....	299
Longer Time on Agricultural Loans Granted by Federal Reserve Banks .....	299
Conversion of the War Finance Corporation Into a Permanent Intermediate-Time Credit Institution .....	300
<b>CHAPTER XII, RANCH LABOR .....</b>	<b>301-315</b>
Regular Labor .....	301
Seasonal Labor .....	301
The Amount of Labor .....	302
Kinds of Labor .....	303
Ranch Labor in Fiction .....	304
Ranch Labor Today .....	305
Source of Supply of Labor .....	307
Wages of Labor .....	308
Nationality of Labor .....	312
Age and Conjugal Relation of Laborers .....	313
Length of Period of Employment .....	314
<b>CHAPTER XIII, RANCH PRODUCTS .....</b>	<b>316-332</b>
Classification .....	316
Products for Home Consumption .....	316
The Production of Work Stock .....	316
Products Grown for Market .....	317
Factors Determining the Quantity of Salable Products .....	324
Relative Importance of the Different Ranch Products .....	332
<b>CHAPTER XIV, MARKETING RANCH PRODUCTS .....</b>	<b>333-395</b>
Marketing Defined and Described .....	333
Barter Economy .....	333
Money Economy .....	333
Commercial or Credit Economy .....	334
"Market" Defined and Described .....	335
The Economic Basis of Marketing .....	336
Range Livestock Marketing .....	339
Range Livestock a Perishable Product .....	339
Influence of Size of Ranches and of Livestock Run .....	342
Lack of Credit May Force Range Livestock on the Market .....	343
Variety and Seasonal Character of Range Livestock Supply .....	345
Types and Classes of Range Livestock Marketed .....	345
Time of Marketing Suttton County Livestock .....	346
Age at Which Different Types and Classes of Livestock Are Marketed .....	354
The Livestock Marketing Process .....	357
Local Marketing .....	357
Problems of Getting Range Livestock to Central Markets .....	359
Driving from Ranch to Shipping Point .....	359
Shipping Problems .....	362

## CONTENTS

Page

Shipping Through One Central Market to Another.....	362
Selling Livestock on the Central Markets .....	362
Agencies Which Aid in Bringing Livestock to the Point of Sale .....	362
Analysis of the Sales Process .....	364
The Demand Side of the Market .....	365
Expenses of Marketing .....	366
Relative Advantages of Corporate and Cooperative Sell- ing Agencies .....	373
Essentials of Cooperation .....	374
National Agency .....	376
Other Livestock Selling Agencies .....	376
Mail Order Business .....	376
Auctions .....	379
Future Demands for Beeves and Muttons .....	381
Marketing Wool and Mohair .....	383
Shearing .....	387
Quantity of Wool and Mohair Marketed .....	391
Wool and Mohair Grading and Scouring Plant .....	393
Wool and Mohair Marketing Credit .....	395

## PART III, SOCIAL STUDIES

CHAPTER XV, THE RANCH COMMUNITY .....	399-410
Definitions .....	399
"Community" Defined and Described .....	399
The Neighborhood .....	402
Size of the Sonora Community .....	402
Where the Ranch People Live .....	407
Financing a Ranch Community .....	408
The Retired Ranchman .....	409
CHAPTER XVI, RANCH LIFE .....	411-425
The People .....	411
Social Institutions .....	414
The Ranch Home .....	414
Location .....	414
Functions .....	415
Size of Headquarters Houses .....	417
Home Equipment .....	417
Schools .....	418
Sonora School Building and Equipment .....	420
Teachers and Their Salaries .....	420
Churches .....	421
Church Attendance .....	422
Sunday School .....	422
Church Finance .....	423
Lodge Activities .....	424
Stability of Ranch Population .....	424
BIBLIOGRAPHY .....	426-437

TABLES

Table	Page
1 Showing the uses of land, by percentages, present and potential, in the United States .....	31
2 Showing the uses of land, by numbers of acres and percentages, in Texas at the present time .....	32
3 Population of Sutton County by years .....	53
4 Land values of Sutton County by years .....	54
5 Livestock in Sutton County .....	55
6 The mean monthly and annual precipitation of Sutton County .....	55
7 Monthly and annual precipitation for San Angelo, Texas, for years 1904-1920 .....	56
8 Showing the total snowfall per year, the number of days during the year on which it rains, is cloudy, part cloudy, and clear, at San Angelo, 1911-1920 .....	57
9 Showing first and last killing frosts, San Angelo .....	61
10 Showing the mean, absolute maximum, and absolute minimum monthly temperatures at Sonora, Sutton County .....	62
11 Showing wind velocities at Del Rio, for 1920 .....	63
12 Showing number of ranches studied, grouped according to size and per cent. of ranches, number of sections and per cent. of sections found in each group .....	90
13 Showing the classes of land on the ranches studied .....	91
14 Showing classification of all lands included in the study into cultivated land, tillable land still in grass, non-arable grazing land; the average number of each per ranch, the distribution of lands by percentages .....	93
15 Showing the cultivated lands; the average number of acres of cultivated land per ranch, and per section; the ratio of cultivated to all lands and land within each group; and the percentage distribution of cultivated lands .....	96
16 Showing the tillable lands still in grass; the average number of acres of tillable land and land still in grass per ranch and per section; the ratio of tillable lands still in grass to all lands and land within each group; and the percentage distribution of tillable lands still in grass .....	98
17 Showing the arable lands, which include both "cultivated lands" and "tillable lands still in grass"; the average number of acres of arable land per ranch and per section; the ratio of arable to all lands and land within each group; and the percentage distribution of arable lands .....	100
18 Showing the non-arable grazing lands; the average number of acres of non-arable grazing land per ranch and per section; the ratio of non-arable grazing lands to all lands and land within each group; and the percentage distribution of non-arable grazing lands .....	103

Table	Page
19 Showing the grazing lands which include both "tillable lands still in grass" and "non-arable grazing lands"; average number of acres of grazing lands per section; the ratio of grazing lands to all lands and land within each group; and the percentage distribution of grazing lands . . . . .	104
20 The size of farms in Sutton County . . . . .	107
21 Showing the number of ranches studied, grouped according to size and per cent. of ranches, number of sections and per cent. of sections found in each group . . . . .	109
22 Showing the answers to the question "Is ownership better than lease?"; number of answers given and classification of answers by reasons given . . . . .	134
23 Showing classifications of ranches into ranches owned, ranches leased, and ranches part owned and part leased; and the percentage of ranches owned, leased, part owned, and part leased	137
24 Showing length of ranch tenure by single average, median and mode; ranches grouped according to size . . . . .	140
25 Showing number of ranches owned; number part owned and part leased; number leased, and manner of acquiring ownership. .	142
26 Showing number of ranches leased or part leased; the number leased for fixed amount of cash, and number leased for share of income; and average amount paid per section on ranches leased for cash . . . . .	148
27 Average age of ranch operators . . . . .	155
28 Showing ages of 87 ranch operators in Sutton County. . . . .	156
29 Showing the answers of the ranchmen to the question, "What are the essentials of a good ranch?" . . . . .	160
30 Nutrition requirements of different types and classes of livestock	166
31 Showing the total carrying capacity units utilized by cattle, sheep and goats in Sutton County, per group and per section . . .	187
32 Showing area of ranches reporting livestock, number of cattle by classes, and total numbers of cattle per section of area reporting livestock . . . . .	196
33 Showing area of ranches reporting livestock, number of sheep per section of area reporting livestock . . . . .	198
34 Showing area of ranches reporting livestock, number of goats by classes, and total number of goats per section of area reporting livestock . . . . .	199
35 Inventory of registered breeding animals in Sutton County . . .	202
36 Showing distribution by classes, numbers and percentages of the normal cattle population of Sutton County, Texas, on the basis of 29,745 cows as found by the writers in August of 1920, presuming that the increase is sold as calves . . . . .	204
37 Showing distribution by classes, numbers and percentages of the normal cattle population of Sutton County, Texas, on the basis of 29,745 cows as found by the writers in August of 1920, presuming that the increase is sold as yearlings . . . . .	205

38	Showing distribution by classes, numbers and percentages of the normal cattle population of Sutton County, Texas, on the basis of 29,745 cows as found by the writers in August of 1920, presuming that the increase heifers are sold as yearlings and the increase steers as 2's .....	206
39	Showing the carrying capacity requirements of Sutton County cattle when 29,745 cows are kept and the increase is sold as calves .....	207
40	Showing the carrying capacity requirements of Sutton County cattle when 29,745 cows are kept and the increase is sold as yearlings .....	208
41	Showing the carrying capacity requirements of Sutton County cattle when 29,745 cows are kept and the increase heifers are sold as yearlings and the increase steers as 2's .....	209
42	Showing how the 57,782 carrying capacity units devoted to cattle in 1920 would be utilized if cattlemen pursued the policy of selling the increase as calves .....	211
43	Showing how the 57,782 carrying capacity units devoted to cattle in 1920 would be utilized if cattlemen pursued the policy of selling the increase as yearlings .....	212
44	Showing how the 57,782 carrying capacity units devoted to cattle in 1920 would be utilized if cattlemen pursued the policy of selling the increase heifers as yearlings and the increase steers as 2's .....	213
45	Showing how the 57,782 carrying capacity units devoted to cattle in 1920 would be utilized if cattlemen pursued the policy of selling at the ages listed below. Showing in detail the age at which the increase is sold, number for sale and the price per head, and the value .....	214
46	Showing how the 57,782 carrying capacity units devoted to cattle in 1920 would be utilized if cattlemen pursued the policy of selling at the ages listed below. Showing in detail the age at which the increase is sold, number for sale and the price per head, and the value .....	215
47	Showing the numbers for sale, the value of sales in February of 1920 and of 1922, the depreciation and the percentage of depreciation 1920 to 1922, and the return per carrying capacity unit in 1920 and 1922 respectively .....	218
48	Showing how the 34,644 carrying capacity units devoted to sheep in 1920 would be utilized if ranchmen pursued the policy of selling the increase as lambs .....	220
49	Showing how the 34,644 carrying capacity units devoted to sheep in 1920 would be utilized if ranchmen pursued the policy of selling the increase as ewe lambs and as yearling muttons ..	221
50	Showing how the 12,686 carrying capacity units devoted to goats in Sutton County in 1920 would be utilized if ranchmen pursued the policy of selling the increase as kids .....	222
51	Showing how the 12,686 carrying capacity units devoted to goats in Sutton County in 1920 would be utilized if ranchmen pursued the policy of selling the increase as yearlings.....	223

Table	Page
52 Showing how the 105,112 units of carrying capacity devoted to cattle, sheep and goats were utilized in August, 1920 .....	225
53 Showing how the 105,112 units of carrying capacity devoted to cattle, sheep and goats are utilized if the increase of cattle is sold as yearling heifers and two-year-old steers; the increase of sheep sold as lambs, and the increase of goats sold as yearling muttons and does .....	226
54 Showing total number of miles of fence in Sutton County .....	231
55 Showing number of operators reporting outside fences of woven wire .....	232
56 Showing values of all outside fences, all inside fences, total value, and value per ranch, section, acre, and mile .....	234
57 Showing total value of all fences per section and per mile ....	236
58 Showing value of headquarters houses on ranches .....	239
59 Showing the kind, numbers and values of income-yielding buildings on ranches .....	242-243
60 Showing the number of wells used for watering livestock, their depth, cost of drilling and of piping .....	247
61 Showing the estimated value of all productive permanent improvements on the 97 ranches studied in Sutton County .....	253
62 Showing the total numbers of livestock by types .....	259
63 Showing automobiles, trucks, tractors, windmill tools, harness and saddles owned by ranch operators .....	259
64 Showing number of implements and ranch machinery owned by ranch operators .....	260
65 Showing loans on land due individuals or banks .....	267
66 Showing number of loans on land due individuals or banks where both the amount of loan and the rate of interest are stated	269
67 Showing number of loans on land due individuals or banks and the length of time for which these loans are made .....	270
68 Showing the distribution of the 68 ranches whose owners borrow on livestock and the number and classification of livestock on these ranches .....	274
69 Showing the number of borrowers on livestock in Sutton County	275
70 Showing the number of loans on livestock where both amount of loan and rate of interest are stated .....	283
71 Showing 58 loans on livestock grouped according to the size of loans and rate of discount .....	284
72 Showing the number and distribution of all laborers on the 97 ranches studied in Sutton County .....	302
73 Showing number of grown men laboring continuously on the ranches studied in Sutton County .....	303
74 Showing number of operators hiring hands regularly .....	310

Table	Page
75 Showing the number of ranchmen on different sized ranches employing extra laborers and the particular work they are supposed to do .....	311
76 Showing distribution of hired labor employed, by nationality and different sized ranches .....	317
77 Showing 100 ranch laborers regularly employed, distributed by age groups .....	31
78 Showing 117 laborers regularly employed, grouped according to nationality and length of service .....	317
79 Showing the number of pounds of cattle, sheep and goats shipped out of Sutton County annually .....	317
80 Showing the number of pounds of wool and mohair shipped out of Sutton County annually .....	319
81 Showing ranchmen's estimates of the tonnage in pounds going out of Sutton County .....	321
82 Showing ranchmen's estimates of the tonnage in pounds of incoming freight, distance hauled and cost of freighting .....	323
83 Showing the actual ratio of calf, lamb and kid crops to number of mother animals for the years 1920 and 1919 .....	324
84 Showing answers to question "How do you handle cows preceding, during and following calving?" .....	327
85 Showing answers to question "How do you handle does preceding, during and following kidding?" .....	328
86 Showing answers to question "How do you handle ewes preceding, during and following lambing?" .....	328
87 Showing the average of the estimated ratios of the normal calf, lamb and kid crops raised, to number of mother animals bred .....	329
88 Showing causes and percentages of death losses in cattle .....	330
89 Showing the average weights of fleeces of different classes of sheep and goats on the Texas Ranch Experiment Station for 1919. ....	332
90 Showing answers to question "At what age do you market the increase of your cattle?" .....	344
91 Showing receipts at the Fort Worth Stock Yards by months for the year 1921 .....	349
92 Showing answers to question "At what age do you market cows?" .....	356
93 Showing answers to question "At what season do you market steers" .....	356
94 Showing answers to question "At what age do you market steers?" .....	357
95 Showing expenditures of a livestock commission company for calendar year 1918 .....	368
96 Showing answers to the question "When do you shear sheep?" .....	389
97 Showing answers to the question "When do you shear goats?" .....	390
98 Showing where Sutton County ranch operators market their wool and mohair .....	391
99 Showing towns where railroad service is obtained by Sutton County ranchmen .....	40
100 Showing number of Sutton County ranch operators who order by mail .....	40
101 Showing number of Sutton County ranch operators who live on ranch all time, number who live in town all time, and number who live in town during the school term .....	40



## ILLUSTRATIONS

Figure	Page
1 Society loses when men try to cultivate land like this .....	26
2 "The natural domain of the grazier . . . nutritious grasses, good water and natural protection." .....	27
3 Above: The domain of the farmer Below: The domain of the grazier .....	29
4 Outline of the field of economics .....	40
5 Typical West Texas ranch topography .....	47
6 This soil is too thin, dry and stony for profitable farming .....	48
7 Soil map, showing location and relative size of area studied .....	49
8 Geological map of Texas, showing the location and relative size of the area included in this study .....	50
9 Types of water supply .....	52
10 Normal precipitation for San Angelo, Texas .....	57
11 Map showing the average rainfall in the Edwards Plateau region	59
12 Map showing seasonal rainfall in the Edwards Plateau region ....	60
13 Native vegetation on the range. This view was photographed May 25, 1919, before any stock had been grazed on this land that year .....	66
14 Close view of sotol, fifty miles south of Sonora, in the Devils River region. This is good sheep and goat range .....	67
15 Sotol in bloom, close view, July 15, 1920 .....	68
16 The effect of productivity on the grades of land .....	85
17 The effect of distance from markets on the grades of land ....	87
18 The cultivated, arable and non-arable lands of the 97 ranches studied .....	91
19 Harvesting Sudan grass hay, Ranch Experiment Station. An example of cultivated land in the area studied .....	94
20 Comparative amounts and distribution by groups of cultivated land with total land area of the 97 ranches studied .....	95
21 Tillable land still in grass .....	97
22 Comparative amounts and distributions by groups of tillable land still in grass, with total area of the 97 ranches studied ....	99
23 Because of topography, shallow soil and lack of water, this land will remain untilled throughout this geological age .....	102
24 Analysis of the amounts of capital used on the family-sized farm and ranch .....	112
25 Size of farms in Sutton County according to U. S. Census.....	115
26 Size of the 97 ranches studied in Sutton County .....	116
27 Lay-out of a 10 1-2 section ranch in Sutton County .....	133
28 Tenure of the 97 ranches studied in Sutton County .....	135
29 Methods by which operators obtained the 60 owned ranches in Sutton County .....	141
30 There is wide variation in the amount and variety of cover on the range .....	170
31 Feed reserves, properly used, increase the carrying capacity of the range .....	172
32 The distribution of watering places has a vital influence on the carrying capacity of the range .....	174
33 An approximation of the proportion of the potential carrying capacity utilized by cattle, sheep and goats .....	177

Figure	Page
34 Level, rolling and rough grazing lands, and the types of livestock best adapted to each .....	180
35 How sheep and goats go to graze .....	183
36 Angora goats browsing, Ranch Experiment Station .....	184
37 Showing the ill effects of over-grazing .....	192
38 Examples of under-grazing .....	193
39 Good sires increase profits if handled by capable men .....	201
40 Fly-traps used to combat the screw-worm .....	216
41 Scenes characteristic of open range cattle ranching in Texas ....	228
42 Some ranch headquarters houses .....	237
43 Sheep barn, Ranch Experiment Station .....	240
44 Well, windmill and reservoirs on Ranch Experiment Station, showing the modern type of watering system for ranches .....	244
45 Dipping cattle .....	251
46 A security that is hard to beat .....	277
47 Showing length of loans on stock cattle, sheep and goats.....	278
48 How long should a stock cattle loan run? .....	279
49 How long should a loan on stock sheep and goats run? .....	279
50 Rates of discount on the 77 livestock loans reported by the 67 borrowers on livestock in Sutton County .....	281
51 Ranch hands at work .....	307
52 Dinner time on the range .....	308
53 Showing method of importing Mexican laborers .....	313
54 Growing cattle like these will increase the quantity and quality of the product of the range .....	318
55 Kids in boxes in shade, to protect them from wind and heat of sun, Ranch Experiment Station .....	326
56 The use of breeding stock like this will increase the weights of the fleeces of wool and mohair .....	331
57 The periodic weights of calves on the Texas Ranch Experiment Station, at Sonora, Texas .....	341
58 Fattening out muttons on a ranch in Sutton County .....	347
59 Average receipts of cattle on the Fort Worth market by months for the years 1903 to 1920 inclusive .....	350
60 Average receipts of sheep on the Fort Worth market by months for the years 1903 to 1920 inclusive .....	351
61 The number of carloads of cattle received on the Fort Worth market by months for the year 1921, the number killed, and the number reshipped .....	352
62 The number of carloads of sheep received on the Fort Worth market by months for the year 1921, the number killed, and the number reshipped .....	353
63 On the trail from the ranch to the shipping point .....	359
64 Cattle often grow stale in crowded pens pending shipment to the feedlots .....	361
65 Standard calves, from the range through to the packing house ....	378
66 Sectional view of Wool Grading and Scouring plant of the Texas Agricultural Experiment Station showing scouring machinery.....	394
67 Sonora, the center of the ranching community studied .....	404
68 The cars which carry the mails from railroad points to interior towns are usually heavily loaded .....	406
69 A typical ranchman .....	412
70 "The solitudes of nature have their compensations." .....	413
71 A typical pasture road .....	415
72 A practical type of gate found on a road in the ranch country ..	416
73 The barbecue occupies an important place in the social life of a ranch community .....	423

## FOREWORD

Ranching has long been considered as an exploitive industry. For this reason, neither the industry nor those engaged in it have received a great amount of favorable consideration at the hands of Society. They have been curbed by both State and Federal legislation and, economically speaking, have been allowed to shift for themselves. The old type of frontier ranching, however, is fast becoming a matter of history, especially so in Texas, where most of the ranch lands are now privately owned and operated.

Exploitive ranching is being succeeded by a better type. This, the modern type of ranching—with which the writers are concerned—deserves more favorable consideration. Instead of being exploitive, it is a genetically productive industry. It utilizes lands which are largely unsuited to the production of cultivated crops, and makes these lands yield a greater net product than would be realized if they were used for any other known purpose at the present time.

In this more modern type of ranching, the *entrepreneur* or the business head, is no longer concerned primarily with the exploitation of the area under his control. Instead, it is to his interest, as well as to that of Society, to concentrate his energies upon a more limited area of land and a more efficient scheme of livestock production. He is now fundamentally concerned with the improvement of the carrying capacity of his ranges, both as to the numbers of heads of livestock which may be run on a section of land and their quality. Furthermore, he is concerned about certain other economic and social problems which extend beyond the confines of his ranch. Among these may be mentioned ranch credits, marketing problems, and such questions as taxation, tariff policies, and transportation.

Broadly speaking, the ranchman, like the farmer, in his efforts to secure a livelihood from the land, is encompassed by an environment which may be divided into three rather distinct groups of forces, commonly designated as physical, biological and social. These forces present him with both his opportunities and his obstacles. Some of the more important of his opportunities lie in the abundance of fertile

lands, favorable climatic conditions, an adequate quota of crops and livestock adapted to his location, and in a suitable market for his products. Among the obstacles which confront him may be mentioned the increasing scarcity of land, declining soil fertility, drouth, flood, and diseases and pests of various kinds. In the main, these may be designated as physical problems, arising out of man's relation with the physical forces. As the country becomes more closely settled, there arise problems of another kind, which relate to increasing the supply of necessities, by the introduction of plants and animals and their improvement by breeding and selection, and by combating their diseases and other enemies. These, in the main, may be classified as biological problems. As population increases and both the physical and biological problems become more and more complex, there arises a third set of problems, which pertain to man's relations with his fellowman. Examples of these problems are rural credits, marketing, taxation, tariff policies, and rural organization. These may be designated as examples of economic, social, and political problems.

As the problems of man's environment become more and more impending, there arises a demand for their solution. At first the husbandman attempted to solve his own problems, but, finding that he was neither technically equipped nor financially able to do his own research work, he called upon his government to create an agency specially designed for the systematic study and solution of these problems. Thus arose the agricultural colleges and agricultural experiment stations of the several states and territories. Since their establishment, the agricultural experiment stations have been the recognized agencies for improving and increasing agricultural opportunities, and overcoming obstacles.

The first problems to be attacked by the agricultural experiment stations were those arising out of the physical forces of the farmer's environment. This was due, in part, to the fact that the farmer was at that time more deeply concerned over the physical problems of agriculture than the biological and social, and in part because of the fact that the

physical sciences were more highly developed, and physical scientists, the chemist for example, were more readily available for the work of the stations than biological workers.

In due time, the farmer became conscious of the biological problems affecting agriculture, and scientists arose who were specialists in this field. A few years after the establishment of the stations, therefore, one finds such specialists as botanists and plant and animal breeders working upon the problems of crop and livestock improvement; plant and animal pathologists and physiologists working upon crop and livestock diseases and structure, and entomologists studying the insect enemies of crops and livestock. More recently the plant and animal geneticist has been added to this group of research workers.

As progress was made in dealing with the physical and biological problems, agriculture was becoming more and more commercialized. Men thus became more conscious of the importance of rural economic and social problems. In the meantime, progress had been made in the sciences of economics and sociology and in their application to rural problems, and capable workers in these fields became available. Hence, one now finds such specialists as the farm management investigator, the agricultural economist, and the rural sociologist, on the staffs of the agricultural experiment stations.

The efforts of the agricultural experiment stations have hitherto been directed primarily toward the solution of the problems of the farms of the country, rather than those of the ranches, even in the states where ranching has played and will continue to play a leading agricultural role. This policy on the part of the stations may have been justified under the old ranching regime, but now that ranching is fast becoming a creative, productive industry, located very largely on land unsuited to farming, and since the permanent ranching area of the United States comprises a very large proportion of all the land devoted to agricultural purposes, men in the ranch business have a just right to demand that their problems be given the same consideration by the agricultural experiment stations as those of the farmers.

This study was undertaken in part to correct the impression that ranching is essentially an exploitive industry and that it is destined to pass away, and in part to aid in placing the grazing industry on a sound economic and social basis. A more or less detailed analysis has been made of the various phases of the ranch business, with a view to calling attention to the more pressing economic problems, and, where the limited data will warrant, to suggest remedies for the existing ills of ranching. The determination to make this study was also stimulated by the fact that the material usually taught in the colleges under the title of "Agricultural Economics" does not cover the entire field which this caption suggests. For the subject-matter of agricultural economics to be complete, it must include more than a treatment of the economics of the farm. Economic principles must be applied to grazing, or ranching, as well as to the farms which are tilled. It seems particularly important that this be done in order that the students of our agricultural colleges, and others, may gain the broadest possible conception of the economic sources of the Nation's supply of food and clothing.

The western agricultural colleges, especially those in the more strictly grazing sections, have paid hardly enough attention to such subjects as range animal husbandry and ranch economics. In the great West of the United States, economic waste will most quickly be checked and social progress best assured by the scientific study and the teaching of these subjects along with those usually found in the curricula.

These studies were conceived by the writers some years ago when engaged in other work pertaining to the livestock industry. They were definitely outlined in the summer of 1918. The schedules used were formulated in the spring of 1920, and the survey proper was begun on August 1, of that year. The field work was completed by December 20, 1920, and the tabulations and interpretations were finished in the spring of 1921. The authors are not unmindful of the fact that these studies are a mere beginning, but it is to be hoped that they will lead to similar studies, more profound and extensive in character. For this reason, certain refinements

have been included in the tables, more for the benefit of students than for the perusal of practical ranchmen. For the same reason, a rather extensive bibliography accompanies the text.

It has been the aim of the writers throughout this study rather to observe the working of economic principles in the ranching business in Sutton County, than to attempt to formulate any simple set of rules for the guidance of ranchmen in the every-day problems of ranch management. The best hope for the ranchman lies in the development of certain guiding economic principles, applicable to ranching, but flexible in their application as to time, place, and local conditions. Instead of attempting, therefore, to tell the ranchman of Sutton County *how* to run his ranch, the writers merely hope to interest him, through this inquiry, in making a more systematic study of his problems. They believe that when studies of this character have been conducted on a sufficiently elaborate scale, the ranchman will be in better position to secure suitable legislation pertaining to his economic and social problems, and in turn to render the greatest possible service as a citizen.

The study could not have been made had it not been for the inspiration received in the classes and seminars at the University of Wisconsin and for the aid and encouragement extended the writers by the more progressive stockmen of the State of Texas and especially of the area studied. Acknowledgments are especially due to Honorable Ed C. Lasater of Falfurrias; Honorable Julian M. Bassett of Del Rio; Honorables W. L. Aldwell, James Cornell, B. M. Halbert, formerly President of the Sheep and Goat Raisers' Association of Texas, and S. E. McKnight, ranchman, of Sutton County; Honorable Sam H. Hill of San Angelo, ranchman and President of the Wool Growers Central Storage Company; Honorable J. E. Boog-Scott, formerly a member of the Substations Governing Board of the Texas Agricultural Experiment Station System and now Chairman of the State Live Stock Sanitary Commission of Texas; the officers of the Texas and Southwestern Cattle Raisers' Association and of the Sheep and Goat

Raisers' Association of Texas; and, lastly, to the President of the Agricultural and Mechanical College of Texas, Dr. William Bennett Bizzell, whose just appreciation of the research method of approaching rural economic and social problems has supported and encouraged the authors in making the study herein reported.

B. YOUNGBLOOD

A. B. COX

May 1, 1921



**PART ONE**

**INTRODUCTION**



## CHAPTER I

# THE RESPECTIVE DOMAINS OF THE FARMER AND THE GRAZIER

### HISTORICAL DEVELOPMENT

In order that one may fully appreciate the position of ranching in our National economy and the motives actuating the study herein reported, this chapter is devoted to a discussion of the respective domains of the farmer and the grazier and to estimates as to the area and extent of the lands occupied by each, both present and potential.

Historically, ranching has been a frontier industry. It has served an important purpose in the economy of the pioneer peoples of both Mexico and the United States. In this country it preceded the farmer from the Atlantic coast to Texas and here it met and blended with Spanish ranching. Abiding in Texas until after the Civil War, it spread northward and westward until it covered the Great Plains area from Texas to Canada.

Another ranching area, with a slightly different history, grew up around the Spanish settlements in Northern Mexico and California. Gradually it spread northward and eastward until it covered the ranges from the Pacific Ocean to the Rocky Mountains, which marked the western boundary of the ranching industry of the Plains.

Always occupying the frontier and in due time always giving way to farming wherever the lands were suitable to crop production, ranching appeared to those who were observing its retreat to be a passing industry. It is not surprising, then, that people came to assume that in due time ranching would pass into history and that its domain would come under the plow. Such observers, however, in making this prediction, failed to take all the facts into consideration.

In fact, there are some factors which are more fundamental in determining the respective domains of the farmer and the grazier than the mere historical trend. Among these may be mentioned soil conditions, climate, topography, and water resources. For successful crop production the soil must be level

to gently rolling, rather fertile or readily made so by suitable methods of farming, and there must be a sufficient amount of rainfall properly distributed, for the growth and maturing of appropriate domesticated plants, or else conditions suitable for irrigation. The exact amount of rainfall required varies considerably with the altitude, latitude and wind velocity, less being required, for example, in Montana than in Southwest Texas.<sup>1</sup> Obviously, there must be available an adequate supply of good water for man and beast.

The productively tillable lands of the humid and semi-humid regions and the irrigable lands of the West comprise the natural domain of the farmer. To the extent that he brings such lands into use faster than remunerative markets are developed for his products, and, furthermore to the extent that he passes beyond his appropriate domain and attempts to bring into cultivation lands unsuited to his purposes, to that extent, at least, farming becomes a hazardous business.

These lands should be yielded by the ranchman to the farmer as fast as they are socially needed. The former not only yield a greater product when put under the plow, but to the grazier they present certain difficulties not met with in drier climates and which make ranching on an extensive scale a rather hazardous enterprise as compared with farming. For example, cattle bog and in winter suffer considerably from the cold and the dampness. Animal diseases and parasites are more numerous and more difficult to control under humid conditions than in drier climates. As a rule, the grasses of the humid sections are less palatable and nutritious than those of the semi-arid. In the humid sections, therefore, livestock requires more supplementary feeding, artificial shelter and individual attention than are necessary in drier climates.

The natural domain of the grazier is wherever he finds an abundance of nutritious grasses, good water, and natural protection for his livestock, and the least number of handicaps such as are encountered in the humid sections. The most favorable conditions for ranching are found in the higher, drier sections of the semi-arid West. There nutritious grasses and other

<sup>1</sup> "Natural Vegetation as an Indicator of the Capabilities of Land for Crop Production in the Great Plains Area"; by Homer LeRoy Shantz, Bulletin No. 201 of the Bureau of Plant Industry, United States Department of Agriculture; Government Printing Office, 1911.

grazing plants are found in great variety. Practically all of these serve as feed for one type of livestock or another, and some of them also provide considerable water. In many sections, particularly the Southwest, conditions are such that grasses cure on the ground and sustain livestock in winter as well as summer. By virtue of centuries of adaptation, these plants live and thrive under conditions largely unsuited to the production of domesticated crops. The climate is such that animal diseases and parasites are much more easily controlled in the semi-arid than in the humid region. In the streams or flowing underground, there is to be found in most places an abundance of water for ranching purposes. Though subject to greater extremes of temperatures and wind velocity, the atmosphere is drier, and, therefore, livestock does not suffer so much from cold as it does in humid sections. The topography is sufficiently broken in most places to afford natural protection to livestock against the winter winds.

So long as the population was relatively small and land was abundant for every purpose, there was no question of grave economic importance as to the respective domains of the farmer and the grazier. When the stockman occupied the potential farming lands, and there was still available in the West a vast area of grazing lands better suited to his purpose, Society gained when

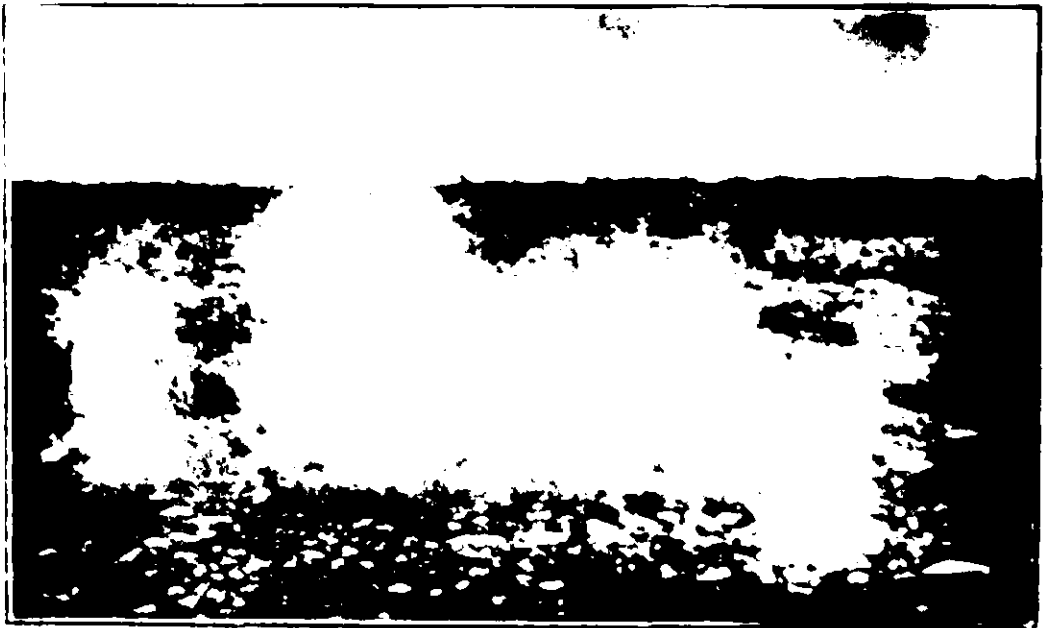


Figure 1. Society loses when men try to cultivate land like this.

to gently rolling, rather fertile or readily made so by suitable methods of farming, and there must be a sufficient amount of rainfall properly distributed, for the growth and maturing of appropriate domesticated plants, or else conditions suitable for irrigation. The exact amount of rainfall required varies considerably with the altitude, latitude and wind velocity, less being required, for example, in Montana than in Southwest Texas.<sup>1</sup> Obviously, there must be available an adequate supply of good water for man and beast.

The productively tillable lands of the humid and semi-humid regions and the irrigable lands of the West comprise the natural domain of the farmer. To the extent that he brings such lands into use faster than remunerative markets are developed for his products, and, furthermore to the extent that he passes beyond his appropriate domain and attempts to bring into cultivation lands unsuited to his purposes, to that extent, at least, farming becomes a hazardous business.

These lands should be yielded by the ranchman to the farmer as fast as they are socially needed. The former not only yield a greater product when put under the plow, but to the grazier they present certain difficulties not met with in drier climates and which make ranching on an extensive scale a rather hazardous enterprise as compared with farming. For example, cattle bog and in winter suffer considerably from the cold and the dampness. Animal diseases and parasites are more numerous and more difficult to control under humid conditions than in drier climates. As a rule, the grasses of the humid sections are less palatable and nutritious than those of the semi-arid. In the humid sections, therefore, livestock requires more supplementary feeding, artificial shelter and individual attention than are necessary in drier climates.

The natural domain of the grazier is wherever he finds an abundance of nutritious grasses, good water, and natural protection for his livestock, and the least number of handicaps such as are encountered in the humid sections. The most favorable conditions for ranching are found in the higher, drier sections of the semi-arid West. There nutritious grasses and other

<sup>1</sup> "Natural Vegetation as an Indicator of the Capabilities of Land for Crop Production in the Great Plains Area"; by Homer LeRoy Shantz, Bulletin No. 201 of the Bureau of Plant Industry, United States Department of Agriculture: Government Printing Office, 1911.

grazing plants are found in great variety. Practically all of these serve as feed for one type of livestock or another, and some of them also provide considerable water. In many sections, particularly the Southwest, conditions are such that grasses cure on the ground and sustain livestock in winter as well as summer. By virtue of centuries of adaptation, these plants live and thrive under conditions largely unsuited to the production of domesticated crops. The climate is such that animal diseases and parasites are much more easily controlled in the semi-arid than in the humid region. In the streams or flowing underground, there is to be found in most places an abundance of water for ranching purposes. Though subject to greater extremes of temperatures and wind velocity, the atmosphere is drier, and, therefore, livestock does not suffer so much from cold as it does in humid sections. The topography is sufficiently broken in most places to afford natural protection to livestock against the winter winds.

So long as the population was relatively small and land was abundant for every purpose, there was no question of grave economic importance as to the respective domains of the farmer and the grazier. When the stockman occupied the potential farming lands, and there was still available in the West a vast area of grazing lands better suited to his purpose, Society gained when

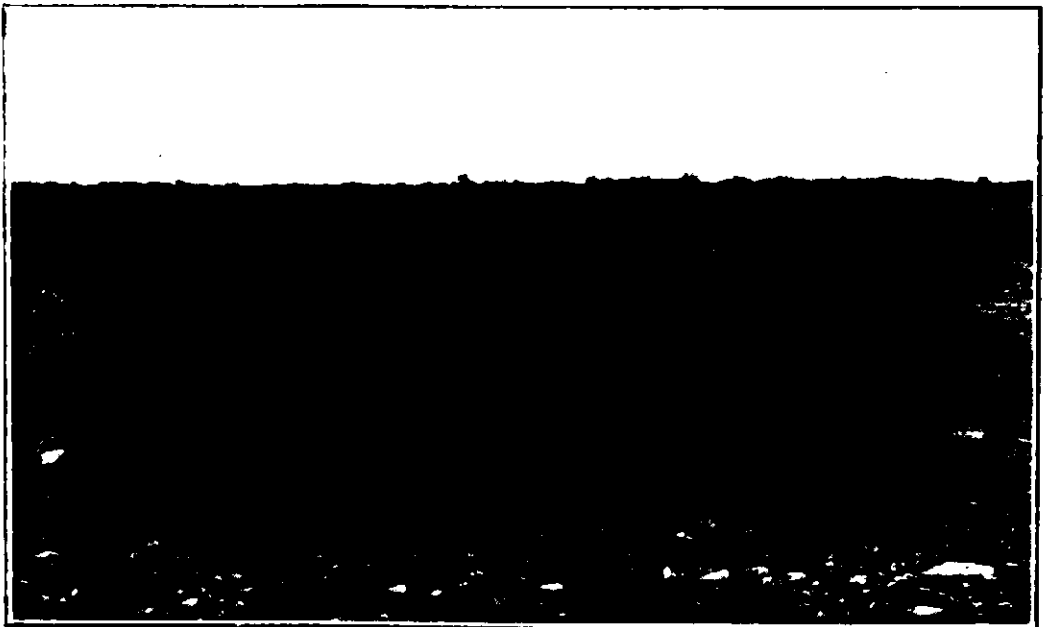


Figure 1. Society loses when men try to cultivate land like this.

he moved on and the farmer converted his grazing lands into productive fields. But whenever the potential farming lands are brought into cultivation and the ranchman has retired to lands better suited to grazing, Society should begin to choose as between the farmer and the ranchman as to which should use the land. The choice should be made on the basis of the greatest net profit to those engaged in production and the greatest net product for the uses of Society. On this basis the farmer should no more be permitted to enter upon the lands suited best to grazing and attempt to farm them than the ranchman has historically been permitted to remain upon and continue to graze the potential farming lands after they have been needed for cultivation.

In the westward movement of population in the United States, a number of boundaries of the farming area have been recognized by the people, some on one basis and some on another. Prior to the 60's it appeared that the farmer would keep well within the timbered areas of the humid region. There the conditions were favorable to pioneering, with the facilities then available. The soils were favorable to the existing implements, and timber was available for buildings, fences and fuel. Water was available from springs, running streams and shallow wells, and in those days the prairies were not considered as fit for farming purposes. The edge of the prairies, therefore, for a time formed the western boundary of the farming area of the country. This limit to the domain of the farmer, however, was removed by the invention of wire fences, improvements in farm implements, the building of the railroads, better protection, and a general advancement in agricultural knowledge.

As a result of these improvements the occupation of the prairies by the farmers began, and this movement did not stop until the farming area had been extended well onto the borders of the semi-arid region. Here it appeared that farming had reached its western limits because of an inadequacy of rainfall.

Finally the dry-farming movement came, with its magical fetishes such as "moisture conservation," "soil management," and "dry-land crops," which urged the farmers onward toward the desert. The optimism which had attended the opening of the prairie farms grew and grew until it knew no bounds. Those who had witnessed the successful conversion of the grazing grounds of the prairies into farms now expected to see the day





1947. Substrate. Wood. 1000.



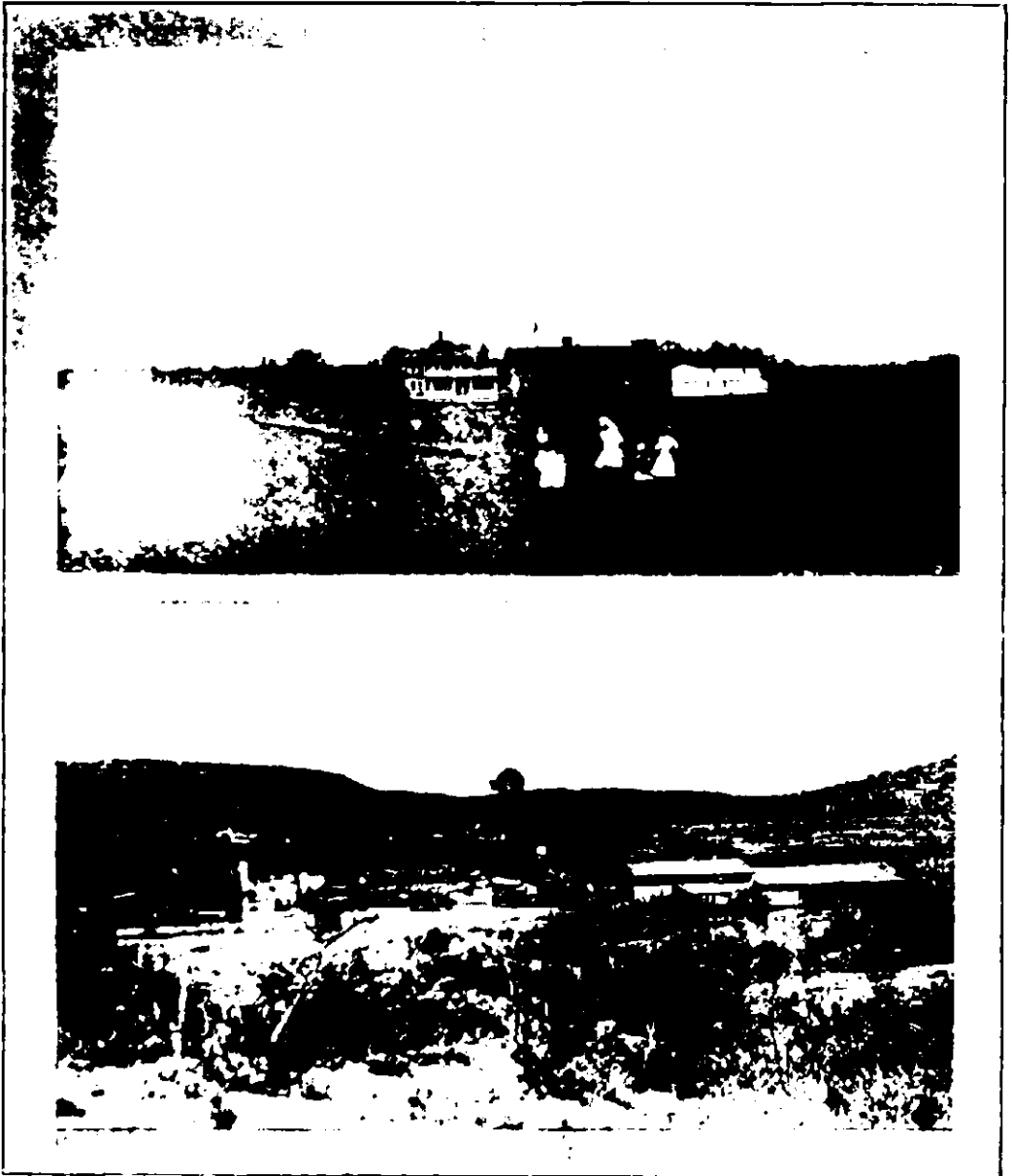


Figure 3. Above: The domain of the farmer.  
Below: The domain of the grazier.

when the grazier would be driven into the mountains and the greater part of the West would be put under the plow. Many who had observed the strides of the farmer westward, from the woods on to the prairies and from the prairies on to the Plains, believed that the climate was changing, that rainfall followed the farmer wherever he went, and that hardly any place was so dry but that there would be developed for it suitable drouth-resistant crops and successful farming made possible.

Thus began a movement into the dry country which did not end until the West, from Texas to Canada and from Western Nebraska to the Pacific slope, was dotted with the wrecks of this invasion. The consequences were a setback to the grazing industry and misery and poverty for the dry-farmer and his family. Society sustained a loss for which it received nothing in return except a demonstration of the truth that no method of farming will serve as a substitute for suitable soils and a requisite amount of water for crop production. Such costly mistakes show that some more accurate method should be devised for separating the arable from the non-arable land than has hitherto been employed.

While the dry-farming movement must be charged with having gone too far in many cases in bringing arid lands into cultivation and with having brought about great economic and social losses both to the individuals concerned and to Society, it must be credited with having advanced the potentially arable lands of the Plains to higher uses and thus contributed to the development of the country.

In the absence, however, of scientific guidance whereby farmers and ranchmen might limit their activities to their respective domains, they have had to learn by bitter experience that in the United States there are vast areas of non-tillable, non-arable, permanent grazing lands which are best utilized in the light of present knowledge when left in the hands of the grazier. The sooner this fact becomes generally recognized and there are developed State and National policies by which lands are classified and distributed in units of suitable size for their most appropriate uses, the better it will be for all concerned.

## AREA AND EXTENT OF GRAZING LANDS

### *United States*

An idea of the importance of ranching in our National economy may be secured from the following figures as to the area and extent of grazing lands in the United States: According to Baker and Strong<sup>2</sup>, we had in 1910 about 745 million acres of range land and unimproved pasture, or 39.3 per cent. of the

whole; about 478 million acres of improved land in farms, or 25.2 per cent.; about 600 million acres of forest and wood land, or 31.5 per cent.; about 40 million acres in towns, cities, roads, and so forth, or about 2 per cent., and another 40 million acres in deserts, not grazed, or about 2 per cent. It is estimated that at least two-thirds of the forest and wood lands of the country are also suitable for grazing. Adding this acreage to that of the range land and unimproved pasture, we have the equivalent of about 1145 million acres of grazing land in the United States at the present time, or about 58 per cent. of the landed area of the country.

TABLE 1

Showing the uses of land, by percentages, present and potential, in the United States.<sup>2</sup>

	Range land and unimproved pasture	Cities, roads, and so forth	Deserts, not grazed	Improved land in farms	Forest and wood land
Present .....	39.3	2.0	2.0	25.2	31.5
Potential.....	32.4	2.0(+)	2.0(-)	44.7	18.9

The same authorities<sup>4</sup> also present figures as to the potential areas to be devoted to the several uses, as follows: When the range land and unimproved pasture and the forest and wood lands are trimmed to the limit to increase the area of cultivated lands, we will still have about 615 million acres of permanent range land in the United States, or about 32.4 per cent.; about 850 million acres of improved land in farms, or 44.7 per cent.; about 360 million acres of forest and wood land, or 18.9 per cent.; 40 million acres or more in towns, cities, roads, and so forth, or about 2 per cent., and about 38 million acres in deserts, not

<sup>2</sup> "Arable Land in the United States," by O. E. Baker and H. M. Strong; Separate from Yearbook of the United States Department of Agriculture; No. 771, 1918. Government Printing Office, Washington, D. C. Graph 10, Plate X, 1919.

<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

grazed, or nearly 2 per cent. Presuming, again, that two-thirds of the potential forest and wood lands are suitable for grazing, and adding this acreage to that of the range land and unimproved pasture, we should have the equivalent of 855 million acres, or 45 per cent., of permanent grazing land in the United States.

### *Texas*

The tendency to under-estimate the importance of grazing as an industry is well brought out in the case of the State of Texas. Texas is known throughout the country as the leading agricultural state so far as the value of her farm products is concerned. Few people realize that of the total landed area of the State, comprising nearly 168 million acres, we have 123½ million acres, or 73.4 per cent., devoted to grazing; 31¼ million acres, or about 18.6 per cent., classed as improved land in farms; 10 million acres, or 6 per cent., in forests, and 3 1.3 million acres, or 2 per cent., in highways, railroads, towns, cities, riverbeds, and so forth. While no figures are available as to the potential acreages to be devoted to the several uses of the lands of Texas, the decline in the rate of increasing the farm acreage in this State, as shown by the Census, indicates that we are fast approaching the limit of our farming area and that probably for all time Texas will continue to have a larger area devoted to grazing than to the production of crops.

TABLE 2

Showing the uses of land, by numbers of acres and percentages, in Texas at the present time.

Classification	Number of acres in classification	Per cent. of total landed area in classification
Total .....	167,934,720	100.0
Grazing area .....	123,348,517	73.4
Improved lands in farms.....	31,227,503	18.6
Forest and wood land .....	10,000,000	6.0
Roads, cities, towns, riverbeds, and so forth .....	3,358,700	2.0

## CHAPTER II

### RANCH ECONOMICS DEFINED

#### THE ORIGIN OF THE TERM "RANCH"

Ranching has been most frequently thought of as an enterprise in the open country where a man's wealth was measured in terms of the number of horses and cattle or bands of sheep which he possessed. The word "ranch" comes from the Spanish word *rancho*, which originally meant the food given to a set of persons such as soldiers, laborers, or convicts. Next it came to mean the group of men who lived or messed together; and later still, it came to mean not only the men who lived together, but the hut or camp as well as the group itself. Another meaning is a wandering or a roaming, including the area which may be roamed over. On the range it came to be applied to the hut or camp of the stockman, including, of course, those who lived there. When permanent buildings, corrals, fences, and other equipment were installed, the term came to be applied to the larger unit, including the land, the stockman, his help, and his livestock. At the present time the group of buildings, corrals, and so forth, is merely designated as the "headquarters." It is in the broader sense that the term *ranch* is used in this study. It may thus be defined as *that unit of lands and equipments devoted to the production of livestock primarily by grazing and which occupies the major portion of the time of one or more men.*

A ranch may be distinguished from a crop-farm inasmuch as the one is devoted primarily to the production of livestock on the ranges, whereas the other is devoted chiefly to the production of cultivated crops for sale. Intermediate between the crop-farm and the ranch comes the stock-farm. A farm or a ranch may be distinguished from a stock-farm inasmuch as the latter is devoted to two interdependent enterprises, the production of crops to be fed to livestock on the one hand, and the growing of livestock for the consumption of farm-crops on the other. Thus a stock-farm partakes in part of the nature of a ranch and in part of the nature of a crop-farm. Should a stock-farmer change his enterprise so that he becomes primarily the producer of crops

for market, he would, of course, become a crop-farmer; and likewise should a stock-farmer cease to grow crops and come to depend primarily upon native vegetation as sustenance for his livestock, he would thus become a ranchman.

Crop-farming, stock-farming and ranching are three rather distinct methods of extracting a living from the land. If we are ever to develop the economic features of each and ascertain with any degree of precision the separate contributions to individual and to National prosperity, each of them must be given separate analysis and study. This is not possible so long as one is unable to distinguish these in the available agricultural statistics. These statistics should not be inextricably confused in our Census reports and other official or unofficial publications purporting to convey logically classified statistics of agriculture.

The writers were unable to distinguish farms from ranches, to make any estimates as to the size of ranches or as to the amount of meat, wool, mohair and other products of the grazing lands, for the reason that the Census reports include the ranches of the United States among the farms. Pearl<sup>5</sup> gives estimates of the feeds and fodders consumed by animals, but when he comes to ". . . the nutrients derived by grazing animals from green pasturage harvested by the animals themselves," he says, "it seems to the writer hopelessly impossible to arrive at a significant national estimate of the amount of nutriment got by the animals from pasturage. One can, of course, guess at a figure, but there is no means of evaluating the probable error of the guess." He refers to the products of the ranch as ". . . the unknown X of pasturage."<sup>6</sup> Our lack of statistics upon this point presents one of the difficulties which the stockmen encounter when it comes to a public discussion of their problems. They must speak in general terms when before committees of Congress and other bodies where those of opposite interests are present with a vast array of convincing figures. Farms should be known as *farms* and ranches as *ranches*, and we should have separate statistics for each.

<sup>5</sup> Dr. Raymond Pearl, "The Nation's Food," W. B. Sanders Company, Philadelphia, Pennsylvania, 1920; page 206.

<sup>6</sup> Ibid.



## SOME DEFINITIONS

*Of General Economics*

Before attempting to define the term *ranch economics*, it will be well to consider some other definitions, one of general economics and several of agricultural economics and farm management. As a definition of *economics*, the writers have chosen that of Professor Ely.<sup>7</sup> He says: "*Economics is the science which treats of those social phenomena that are due to the wealth-getting and wealth-using activities of man.*" This definition, broadly interpreted, includes every act of man, both as an individual and as a member of a group, in the production, exchange, distribution and consumption of wealth. It is thus concerned with man as a producer of wealth, both as a laborer and as a business manager.

It is also concerned with all those phenomena known as middleman activities, the principles governing the uses of created wealth, and finally with all phases of the distribution of wealth among the factors of production and among individuals or classes.

*Of Agricultural Economics*

Professor Ely's definition is that of the economic activities of man in general.<sup>8</sup> By shifting from man in general to a particular man, the husbandman, his definition may be modified to read as follows: *Agricultural economics is a branch of the science of economics. It treats of those social phenomena that are due to the wealth-getting and wealth-using activities of the husbandman.*<sup>9</sup>

Emil Jouzier, a Frenchman, says:<sup>10</sup> ". . . *agricultural economics is that branch of agricultural science which treats of the manner of regulating the relations of the different elements composing the resources of the farmer, whether it be their relations to each other or to human beings in order to secure the*

<sup>7</sup> Dr. Richard T. Ely, "Outlines of Economics," Third Edition, The Macmillan Company, New York City, 1916; page 4.

<sup>8</sup> Ibid.

<sup>9</sup> The term **husbandman** is meant to include both the farmer and the stockman.

<sup>10</sup> Emil Jouzier, "Economie Rurale," J. B. Bailliere & Fils, Paris, France, 1920 page 13.

*greatest degree of prosperity to the enterprise."* This is clearly a definition of private agricultural economics, as there is nothing in it to suggest a social or a national viewpoint. It covers quite well the farm management features of a definition of agricultural economics.

Taylor <sup>11</sup> says: ". . . . *agricultural economics treats of the selection of land, labor, and equipments for a farm, the choice of crops to be grown, the selection of livestock enterprises to be carried on, and the whole question of the proportions in which all of these agencies should be combined. . .*" But Taylor <sup>12</sup> adds: "Agricultural economics deals not only with economy in production, but also with the problems of justice in the distribution of wealth among the various classes of society with special reference to the effect of the wages system, the land system, the credit system, the methods of marketing, the comparative standards of living of country and city workers, the relative opportunities for accumulating wealth by the different classes, upon the farmer's share in the national dividend and upon the relative well-being of the agricultural population. This subject requires the attention of the agrarian statesman as well as that of the farmer. The farmer needs to understand the economic forces which underlie his success in order to help himself, and the statesman needs to understand these forces in order that he may pass helpful legislation with respect to land, labor, credit, taxation, marketing, etc., and in order that the necessary regulations of the farmer's activity may be carried out with a minimum of reduction in productivity."

Hibbard <sup>13</sup> says: "*Agricultural economics is that branch of economics pertaining to agriculture. It includes all problems of value involved in the production and distribution of farm products. It thus includes questions pertaining to land, labor, and capital, their organization and their combinations, together with their organization into working units. The point of view may be either that of the individual or that of the State. The goal is individual welfare modified by any social welfare that may be imposed.*"

<sup>11</sup> H. C. Taylor, "Agricultural Economics," The Macmillan Company, New York City, 1919; page 6.

<sup>12</sup> *Ibid.*, page 7.

<sup>13</sup> B. H. Hibbard, Professor of Agricultural Economics, College of Agriculture, University of Wisconsin, Madison, Wisconsin; **Lectures.**

Carver,<sup>14</sup> in his book on *The Principles of Rural Economics*, does not formally define the subject, but his first sentence gives one a clue to his point of view. This sentence reads as follows: "The study of a man's efforts to get a living, which is the subject matter of economics, may well be considered one of the most serious and important topics which can possibly engage the attention of the student." In the introduction to Chapter I of his *Principles of Political Economy*, he<sup>15</sup> says: "*Economy* is a name given to a body of principles which govern the practice of economy in its broadest sense." If this definition is applied to rural economy, it might be paraphrased as follows: *Rural economics is a name given to a body of principles which govern the practice of economy on the part of rural people.* In other words, rural economics is merely the application of economic principles to rural enterprise.

### *Of Farm Management*

The next question to consider is what is farm management? Warren<sup>16</sup> says: "*Farm Management is the study of the business principles in farming. It may be defined as the science of the organization and management of a farm enterprise for the purpose of securing the greatest continuous profit.*"

"Successful farming requires good judgment in choosing a farm and in deciding on a type of farming. It demands clear business organization and management for the efficient use of capital, labor, horses, and machinery. It requires good judgment in buying and selling." A good deal of the economist's definition of private economics appears to be carried between the lines of this statement of the definition of farm management.

Boss<sup>17</sup> says: "*Farm management is the application of business principles and the scientific principles of agriculture (as discovered by the chemist, physicist, agronomist, animal husbandman, and other specialists) to the business of farming.*" Boss<sup>18</sup> further states: "... those things that have to do with

<sup>14</sup> Thomas Nixon Carver, David A. Wells Professor of Political Economy in Harvard University, Cambridge, Massachusetts.

<sup>15</sup> Ibid.

<sup>16</sup> Dr. G. F. Warren, "Farm Management," The Macmillan Company, New York City, 1913; Preface.

<sup>17</sup> Andrew Boss, "Farm Management," Lyons & Carnahan, Chicago and New York, 1914; page 15.

<sup>18</sup> Ibid.

the organization and operation within the individual farm relate to farm management. Those that have to do with external relations of the individual farm to the group or community, relate to rural economy.”

Spillman <sup>19</sup> says: “Farm management treats of the business of farming from the following standpoints:

- (1) Relative desirability of farming and other lines of business.
- (2) Selection of the farm.
- (3) Organization and equipment of the farm.
- (4) Farm operation.”

It is apparent that Professor Spillman was not thinking so much from the standpoint of agricultural economics as a matter of national concern as from that of the farmer in relation to his farm.

*Relation of Farm Management to Agricultural Economics:* The definitions of farm management are quoted along with those of agricultural economics because both the farm management workers and the agricultural economists are concerned with problems and principles which lie in the same field of study. The farm management worker has approached this field primarily from the standpoint of the agriculturist. His point of view has been primarily that of the individual farmer selecting, organizing and operating his farm for profit. On the other hand, the agricultural economist has approached this field from the standpoint of the general economist. His point of view has been that of farming as an industry.

For a time some men took the position that these two groups were engaged in separate fields, but a comparison of the results of the studies of each indicates that both are not only in the same field, but that the work of the one supplements that of the other. It has become obvious that the man who studies the value aspects of agriculture must make analyses of the businesses of individual farmers and he must see both the individual farmers and their enterprises in their relations to the industry as a whole and to Society, if he is to deal adequately with the problems encountered in this field.

<sup>19</sup> W. J. Spillman, “What is Farm Management?”, Bureau of Plant Industry Bulletin No. 763, United States Department of Agriculture, Washington, D. C., Government Printing Office, 1910; page 7.

It is, therefore, obviously impossible for one to properly define agricultural economics and not take into account what is commonly known as farm management.<sup>20</sup> It should go without saying that the farm management worker is most efficient who has had sound instruction in economics, and likewise the agricultural economist is most efficient who, in addition to training in economics, has had experience and instruction in agriculture and who is familiar with the work of the several groups of scientific men working for agricultural advancement.

For purposes of research, it seems best to make no distinction between agricultural economics and farm management, but for purposes of teaching and extension, it seems necessary to have differentiation in personnel if not in organization. The latter, however, is purely a matter of institutional convenience and policy.

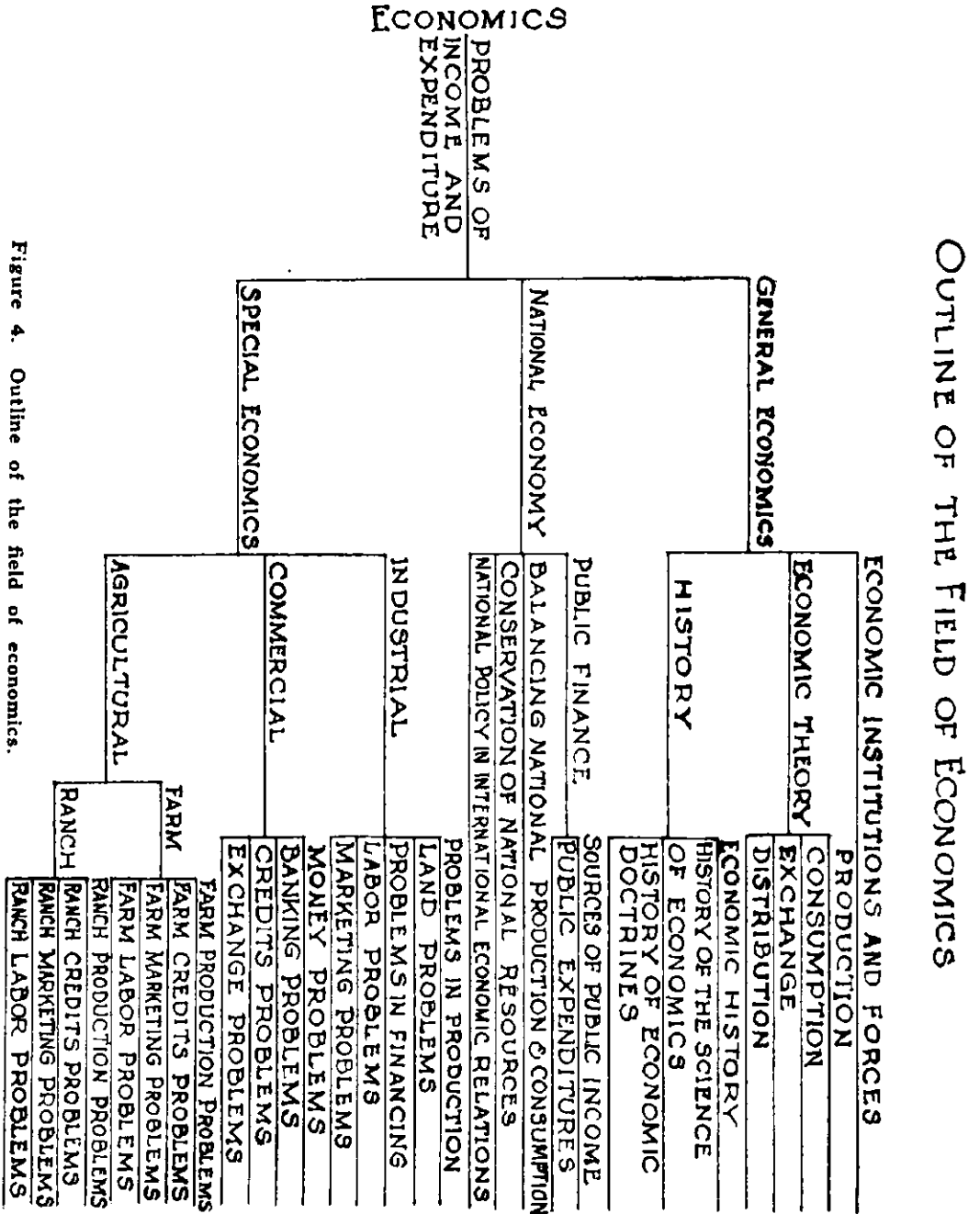
Moreover, it appears to the writers that neither the agricultural economists nor the farm management workers have entirely covered the field in question. In the following definition, therefore, the writers have endeavored to suggest a more elaborate content:

*Agricultural economics is the special field of economics pertaining to agriculture. It is concerned with the historical development both of agriculture as an industry and of its own history as a branch of economic science. It is further concerned with the value aspects of the principles governing production, consumption, exchange and distribution in all their relations with agriculture. It is concerned, moreover, with the relations of the husbandman to his industry and to Society. It treats of the value aspects of selection of land, labor and equipments for an agricultural undertaking; the choice of crops to be grown, and the conservation of the more desirable vegetation for grazing; the selection of livestock enterprises to be carried on, and the proportions in which all these agencies should be combined for the purposes of production. The viewpoint is that of the welfare of the individual husbandman as modified by superior social interests. An analysis of these social interests may be found on page 36 in a quotation from Professor Taylor.*

<sup>20</sup> It is unfortunate that the term "Agricultural Economics" fails to indicate the convergence and blending of these two lines of work.

Of Ranch Economics

We are now ready to define ranch economics. Just as agricultural economics is that part of the science of economics which pertains to agriculture, *ranch economics is that part of agricultural economics which pertains to ranching. It is concerned with the historical development both of ranching as an industry*



OUTLINE OF THE FIELD OF ECONOMICS

Figure 4. Outline of the field of economics.

*and its own history as a branch of agricultural economics. It is further concerned with the value aspects of the principles governing production, consumption, exchange and distribution in all their relations with ranching. It is concerned, moreover, with the relations of the ranchman to his industry and to Society. It treats of the value aspects of the selection of land, labor and equipments for a ranch; the conservation of the most desirable grasses, weeds and brushes for grazing; where possible, the selection of supplementary feed crops; the selection of suitable types and breeds of livestock, and the proportions in which all these agencies should be combined for the purposes of production. The viewpoint is that of the greatest welfare of the individual ranchman as modified by superior social interests.*

#### THE RELATION OF RESEARCH TO THE RANCHMAN AS A MANAGER

Let us now consider briefly the relation of research to the ranchman as a manager. In the operation of his enterprises, the ranchman is always dealing with certain forces which have come to be known to scientists as physical, biological and social. An understanding of these forces is highly important for the reason that the ranchman, like every one else, finds all his opportunities and meets all his obstacles in his relations with them. As examples of his opportunities may be mentioned the abundance of suitable grazing lands, favorable climatic conditions, livestock adapted to ranching, and markets for ranch products. As examples of the obstacles which confront him may be mentioned the increasing scarcity of land, over-grazing, drouth, flood, diseases and pests of various kinds, inadequate credit facilities, unsatisfactory markets and marketing facilities, and problems of range and livestock management, breeding problems, and the like.

Formerly the ranchman knew less about these forces than now and accordingly he suffered more when they were adverse and profited more when they favored him. Out of man's relations with these forces have come certain sciences which have been designated, in accordance with the problems with which they deal, as physical, biological and social. When the ranchman avails himself of his opportunities to take advantage of the

services of these sciences, he is enabled to harness the forces of his environment and make them work for him rather than against him. In this manner his obstacles may be overcome and his opportunities increased. Formerly his chief opportunity lay in the exploitation of free grass. Now his opportunities lie chiefly in the utilization of the sciences in reducing expenses, preventing losses and increasing both quality and quantity of output. Owing to the fact that people have been inclined to believe that ranching was a passing industry, the energies of scientific men have been directed largely to the solution of farm rather than ranch problems. If ranching is to progress, however, the energies of the scientists must be directed to the solution of ranching as well as farming problems.

#### *The Agricultural Experiment Stations*

The greater number of scientific men engaged in the solution of agricultural problems is found on the staffs of the agricultural experiment stations of the country. These stations are branches either of the United States Department of Agriculture or of the state agricultural colleges. The scientific men connected with the stations dealing with the physical forces are known by such titles as agricultural physicists or engineers, agricultural chemists, soils experts, and the like. Those dealing with the biological forces are known by such titles as plant and animal pathologists and physiologists, entomologists, bacteriologists, plant and animal geneticists or breeders, and so forth. Those dealing with the social forces are known by such titles as agricultural, rural, farm or farm and ranch economists or sociologists, farm management workers, and farm and ranch management workers.

Intermediate between the scientists mentioned, who are applying their energies to the study of farm and ranch problems of one kind or another, and the farmers and ranchmen themselves, there is another group of research men, also scientifically trained, who deal with the more specific problems of agronomy, horticulture, animal husbandry, dairying, and similar subjects. These men employ the combined knowledge of the other scientists in bringing about improvement in crop and livestock production and allied enterprises. They are scientific men and are distinguishable from other scientists in that they are not limited in their efforts to the resources of a single science as a



field. Their work often partakes of the nature of the physical and biological and sometimes the social sciences.

The function of the farm and ranch economist is to develop certain guiding principles whereby the husbandman may steer his business along proper channels in the light of the information yielded by all the sciences. This information enables the farmer or the ranchman to deal intelligently alike with the economic aspects as well as with the art of production.

In conclusion, farmers and ranchmen have a right to demand that Society provide facilities for the improvement of their economic and social position as citizens, as well as for increasing their contribution to the Nation's supply of food and clothing.



PART TWO

**THE SURVEY PROPER**



CHAPTER III

THE AREA DESCRIBED

LOCATION

Sutton County is on the Edwards Plateau. This Plateau is described by the geologists as the lower, or Comanchean Cretaceous, comprising several limestones which have resisted erosion and have disintegrated into soil but little faster than it was carried away by precipitous rainfall. The boundaries of this Plateau are outlined in Bulletin No. 44, of the University of Texas, as follows:<sup>21</sup>

"The Edwards Plateau reaches as far east as the Colorado River at Austin and to the Central Mineral Region of Llano, Burnett, Mason, San Saba, and Gillespie Counties . . . Only two streams, the Colorado and the Pecos Rivers, cut entirely across the Edwards Plateau and both of these rivers were in existence before the time of the faulting which caused the Balcones Escarpment. This escarpment bounds the Edwards Plateau on

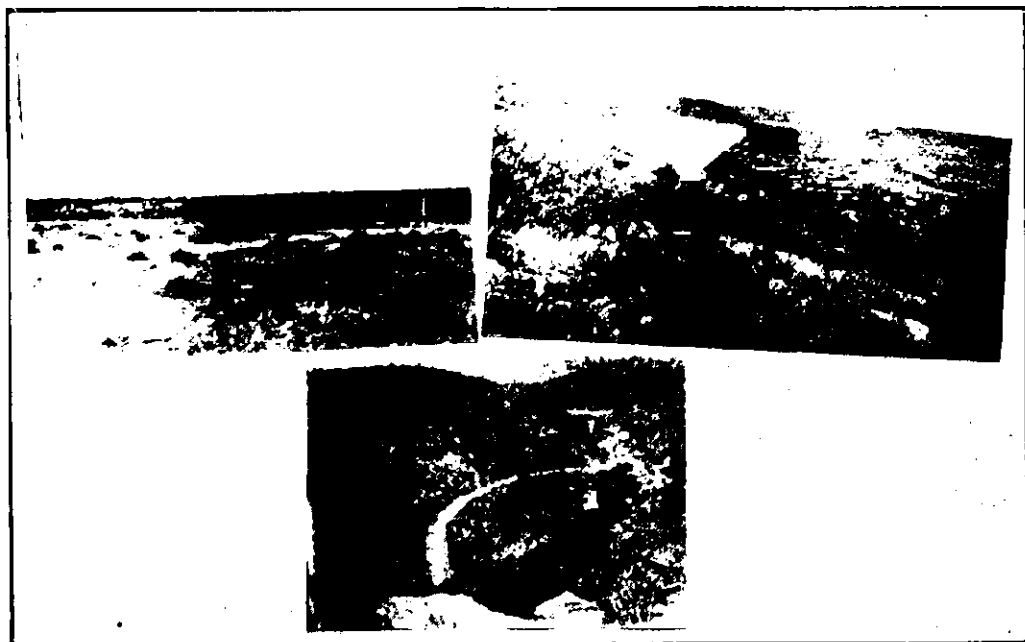


Figure 5. Typical West Texas ranch topography.

<sup>21</sup> J. A. Udden, C. L. Baker and Emil Bose, "Review of the Geology of Texas," Bulletin No. 44, University of Texas, Austin, Texas, 1916; page 17.

the South. The northwest boundary of the Edwards Plateau is the Llano Estacado or Staked Plains, the northern boundary is the north-central Texas Plains and the northeastern boundary is the Colorado River."

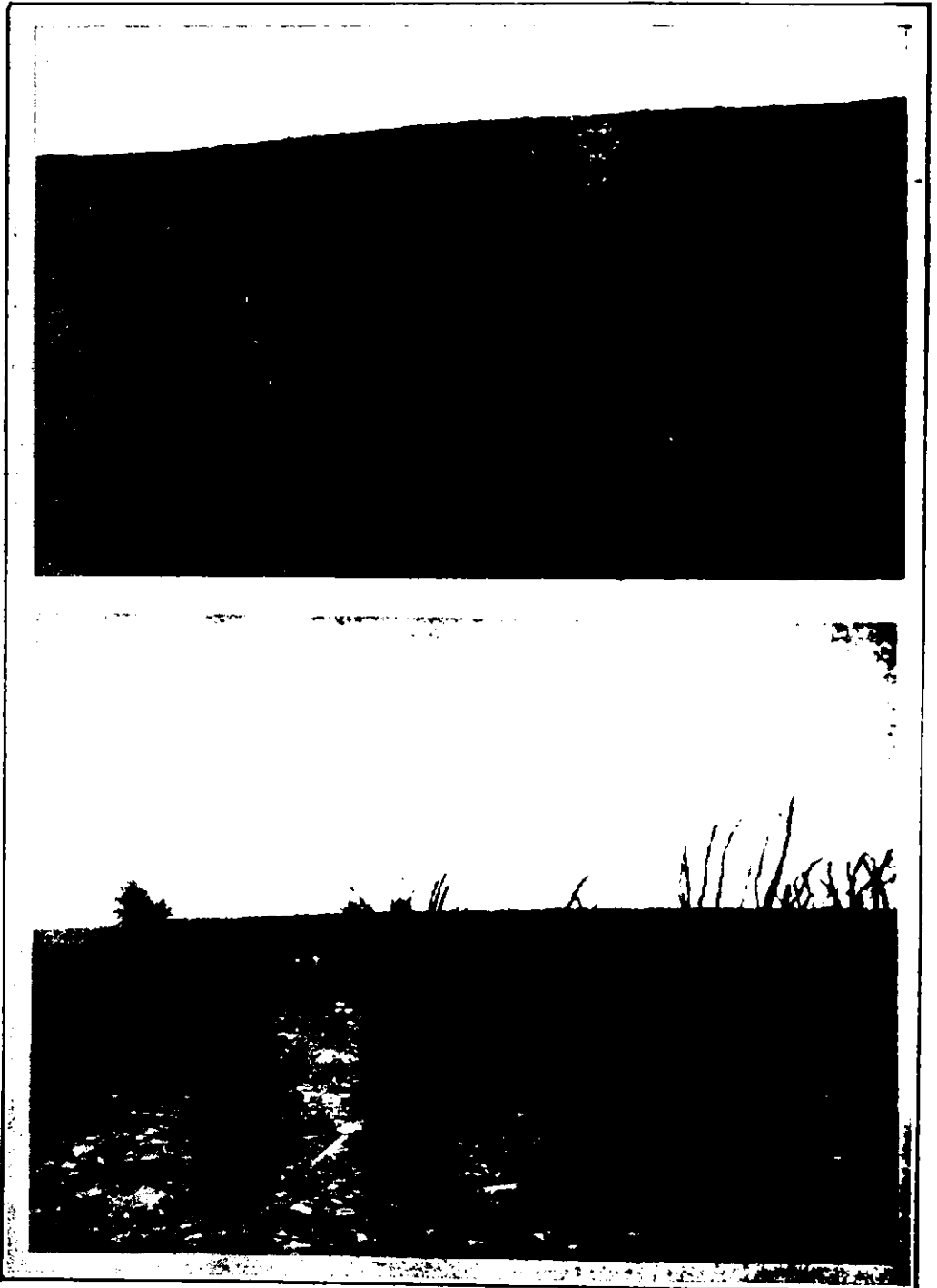


Figure 6. This soil is too thin, dry and stony for profitable farming.

TOPOGRAPHY

“The county is cut and eroded by numerous small streams and ‘draws’ of intermittent flow. Therefore, the surface in gen-

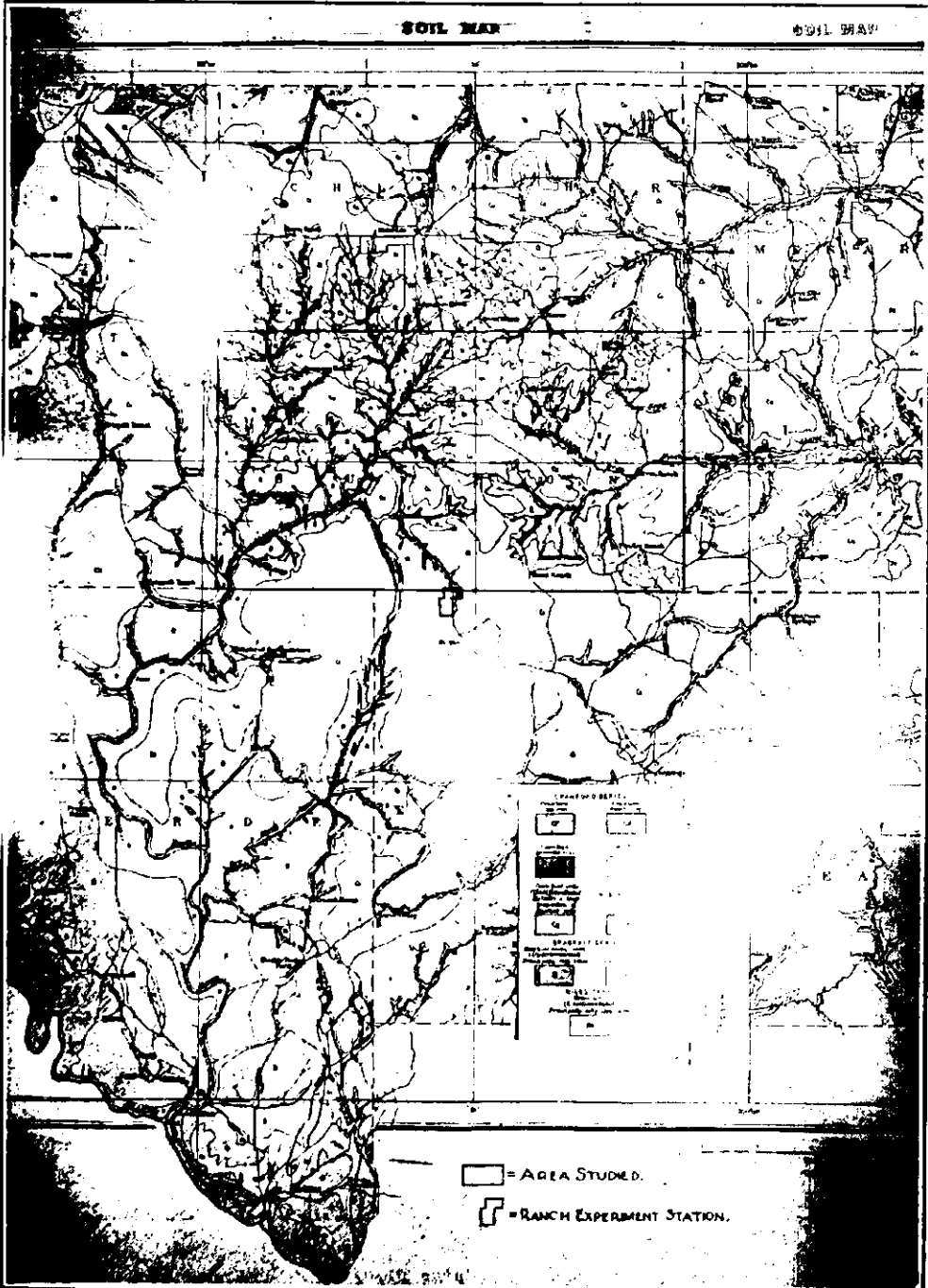


Figure 7. Soil map, showing location and relative size of area studied.

eral is somewhat rough over a considerable part of the county, though on some of the divides good-sized areas of nearly level land represent the old Plateau as it appeared before erosion had carved the present topography.

"This county was included in a general soil survey in 1913 by the Bureau of Soils, United States Department of Agriculture. These soils were mapped and described in the 'Reconnaissance Soil Survey of South-Central Texas,' made in 1913 by A. E. Kocher and party."<sup>22</sup>

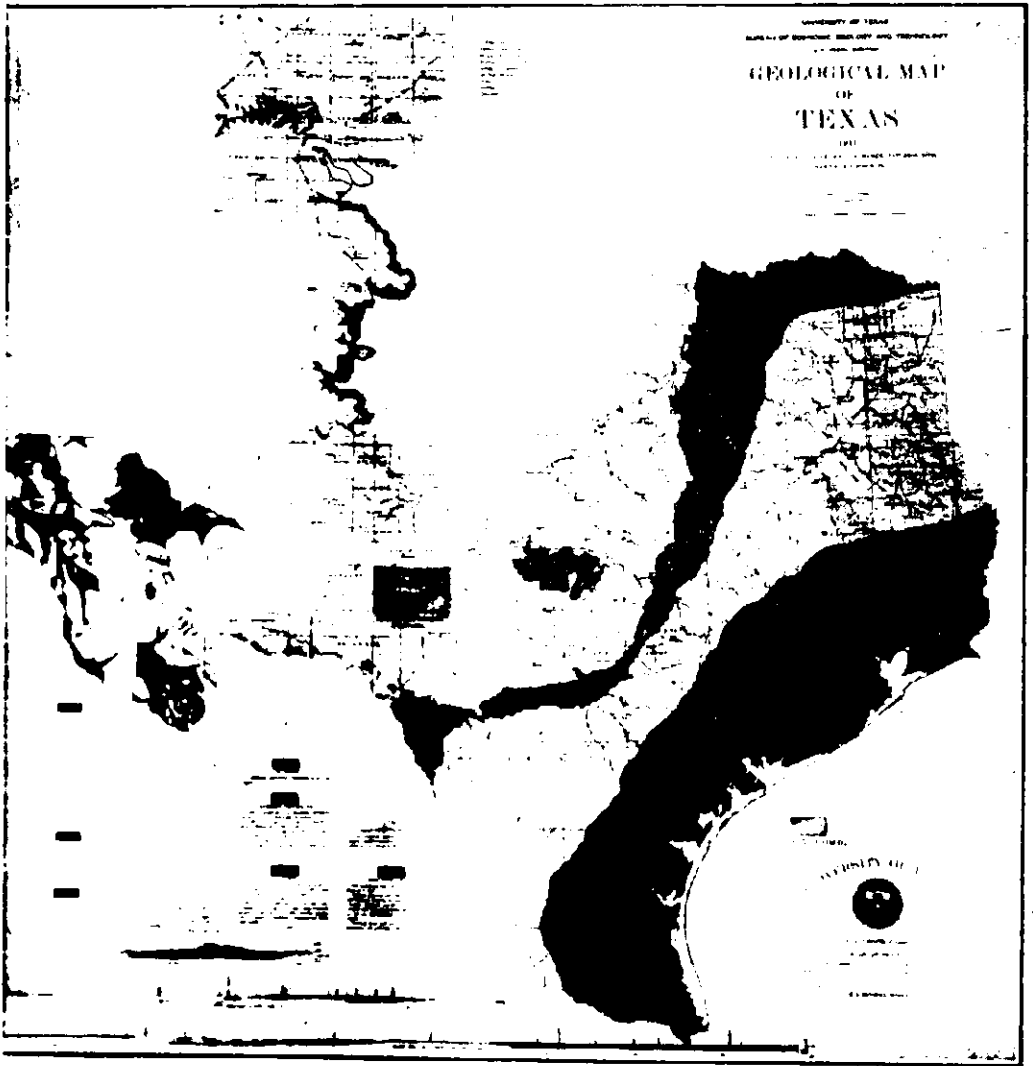


Figure 8. Geological map of Texas, showing the location and relative size of the area included in this study.

<sup>22</sup> Statement of W. T. Carter, Jr., Bureau of Soils, United States Department of Agriculture, Washington, D. C., and Texas Agricultural Experiment Station, cooperating.



## ALTITUDE

The elevation at Sonora is 2200 feet. It varies in different parts of the county from about 2000 to 2500 feet.

## SOILS

"The soils of Sutton County are heavy in texture, ranging from clays to clay loams. Probably 85 per cent. of the area of the county consists of stony clay soils. Probably about 50 per cent. of the area is fairly rough stony land not suitable for cultivation, while a large part of the remainder is so stony as to make cultivation difficult or unprofitable. These soils are residual in origin, being derived from limestone. Probably 5 or 10 per cent. of the land is alluvial in origin and occurs along the small streams in the numerous narrow valleys. The alluvial soils are dark in color and quite productive when moisture conditions are favorable. The upland soils are mostly dark in color though reddish in places."<sup>23</sup>

Another feature of the soils, which makes this area naturally suited to the raising of sheep and Angora goats, is the fact that there is practically no sand whatever in the country. Sand is a great detriment to wool and mohair production. It gets into the wool and mohair, makes shearing difficult, inasmuch as it dulls the shears, and causes a dockage when the wool and mohair are marketed. These points serve merely to illustrate the important relation of the geology and soils of an area to the type of agricultural production followed, a matter too often overlooked by both students and citizens and by legislators.

## WATER RESOURCES

Sutton County, with the exception of the headwaters of the Llanos, in the extreme eastern part, was originally a high dry plateau, with no water other than what was caught in "pot" holes in the beds of the "draws". The rainfall, shown elsewhere, is only about 22 inches annually. The county was brought into continuous use by the boring of wells, which vary from about 250 to more than 400 feet in depth. An abundant supply of good

<sup>23</sup> Statement of W. T. Carter, Jr., Bureau of Soils, United States Department of Agriculture, Washington, D. C., and Texas Agricultural Experiment Station, cooperating.

water for ranching purposes, however, can be secured at these depths, and owing to the relatively high average wind velocity in



Figure 9. Types of water supply.

this section, the water can be pumped rather inexpensively by use of windmills. Under the conditions, however, there can be no irrigation practiced other than very limitedly about the wells for small gardens.

## PEOPLE

The people are chiefly of Southern stock. There is considerable scattering of Mexicans, the chief source of labor, a few Germans, Irish, Scotch, Canadians, and Negroes. The following table shows the population of Sutton County for the years 1890, 1900, 1910, and 1920.

TABLE 3<sup>24</sup>

Population of Sutton County by Years

Year	No. of Persons
1890	658
1900	1727
1910	1569
1920	1598

The declining population shown between 1900 and 1910 probably is due to the transition from herding to fenced ranges. The increase in population from 1910 to 1920 is probably due to the growth of Sonora, the county seat.

## LAND VALUES

The following table shows land values of Sutton County for the ten-year periods from 1890 to 1920:

<sup>24</sup> United States Census Reports.

TABLE 4 <sup>25</sup>

Land Values of Sutton County by Years

Year	Value in dollars per acre
1890	1.15
1900	1.21
1910	4.38
1920	9.96 <sup>26</sup>

### NATIVE ANIMALS

The original wild life of the county consisted of wolves, coyotes, wild-cats, deer, wild turkeys, sometimes buffalo, antelope, and rattlesnakes. At the present time, wild animals are rather scarce. There are, however, some wolves, coyotes, wild-cats, rattlesnakes, deer, and turkeys left in this section. The wolves and coyotes have been the source of considerable losses from early days down to the present time, but during the recent years they have been held in check quite successfully where wolf-proof fences have been built.

### LIVESTOCK

The following table shows the number of cattle, sheep, goats, horses, mules and hogs in Sutton County in 1900, 1910, and 1920:

<sup>25</sup> United States Census Reports.

<sup>26</sup> The most frequent price stated by ranchmen in the summer of 1920 was \$15.00 per acre for land and improvements. Some ranches changed hands during the previous year at \$8.00 to \$20.00 per acre, improvements included.

TABLE 5<sup>27</sup>  
Livestock in Sutton County

Year	1900	1910	1920
Cattle .....	63,251	52,748	58,661
Sheep .....	98,305	58,973	249,099
Goats .....	12,130	59,631	112,382
Horses .....	4,325	4,780	2,451
Mules .....	348	489	170
Hogs .....	2,248	3,834	1,889

<sup>27</sup> United States Census Reports.

CLIMATE

Sutton County lies in the semi-arid region. Owing to the good elevation, the breezes from the south, and the relatively low humidity, the climate is bracing and invigorating. It has been praised by all who have had the pleasure of enjoying it, from the earliest times down to the present.

*Precipitation*

TABLE 6.<sup>28</sup>  
The Mean Monthly and Annual Precipitation of Sutton County.

Month	Inches
Annual .....	22.75
January .....	0.54
February .....	0.92
March .....	0.87
April .....	2.17
May .....	3.04
June .....	2.46
July .....	2.91
August .....	2.00
September .....	3.32
October .....	2.37
November .....	1.67
December .....	0.48

<sup>28</sup> A. E. Kocher and Party. "Reconnaissance Soil Survey of South-Central Texas." United States Department of Agriculture, Bureau of Soils, Washington, D. C., Government Printing Office, 1915; page 21.

TABLE 7 20

Monthly and Annual Precipitation for San Angelo, Texas, for the years 1904-1920

Month	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
<b>Total</b> .....	21.64	21.83	31.87	15.28	22.63	13.84	11.24	32.49	14.79	29.54	27.41	23.50	15.23	8.31	14.42	40.68	20.51
January .....	0.68	0.20	0.10	0.0	0.28	0.10	0.60	0.17	0.0	0.44	0.0	1.32	0.31	0.50	0.46	5.41	2.43
February .....	0.43	1.33	0.57	0.05	0.32	0.02	0.15	3.95	2.06	0.80	0.01	0.95	0.0	0.10	0.41	0.68	0.35
March .....	0.0	3.45	0.89	0.84	1.23	0.11	1.18	2.37	0.40	0.30	0.17	0.30	0.0	0.22	0.25	2.21	0.26
April .....	2.43	3.07	4.24	0.33	6.54	0.10	3.00	3.08	1.40	1.65	1.20	6.40	3.62	0.55	0.10	1.85	0.0
May .....	3.25	6.14	1.87	0.79	1.59	2.90	0.82	0.04	1.12	5.67	5.56	2.43	1.60	2.81	3.88	3.87	1.96
June .....	5.25	2.14	2.44	0.0	1.33	1.88	0.94	0.97	1.62	4.60	1.84	0.47	2.82	0.90	0.35	6.13	4.28
July .....	0.81	0.68	3.79	4.49	2.64	2.46	0.08	4.80	0.28	0.60	2.69	1.60	1.04	0.90	0.10	3.32	0.59
August .....	1.81	0.55	11.31	0.31	3.53	0.92	0.0	7.31	2.90	1.75	7.69	1.34	1.08	0.41	0.25	2.83	6.29
September .....	2.35	0.44	3.90	0.31	1.65	1.80	2.19	2.15	0.0	1.57	0.20	8.27	2.56	1.90	0.80	6.57	1.65
October .....	2.55	2.25	0.71	5.15	1.20	1.80	1.88	1.06	0.92	3.19	4.50	0.0	1.33	0.0	4.74	4.89	1.74
November .....	1.63	1.39	1.52	2.61	2.32	0.60	0.0	0.63	2.02	7.02	3.34	0.02	0.83	0.02	1.48	2.28	0.83
December .....	0.45	0.19	0.53	0.40	0.0	1.15	0.40	5.96	2.07	1.95	0.21	0.40	0.04	0.0	1.60	0.64	0.13

# NORMAL PRECIPITATION FOR SAN ANGELO, TEXAS.

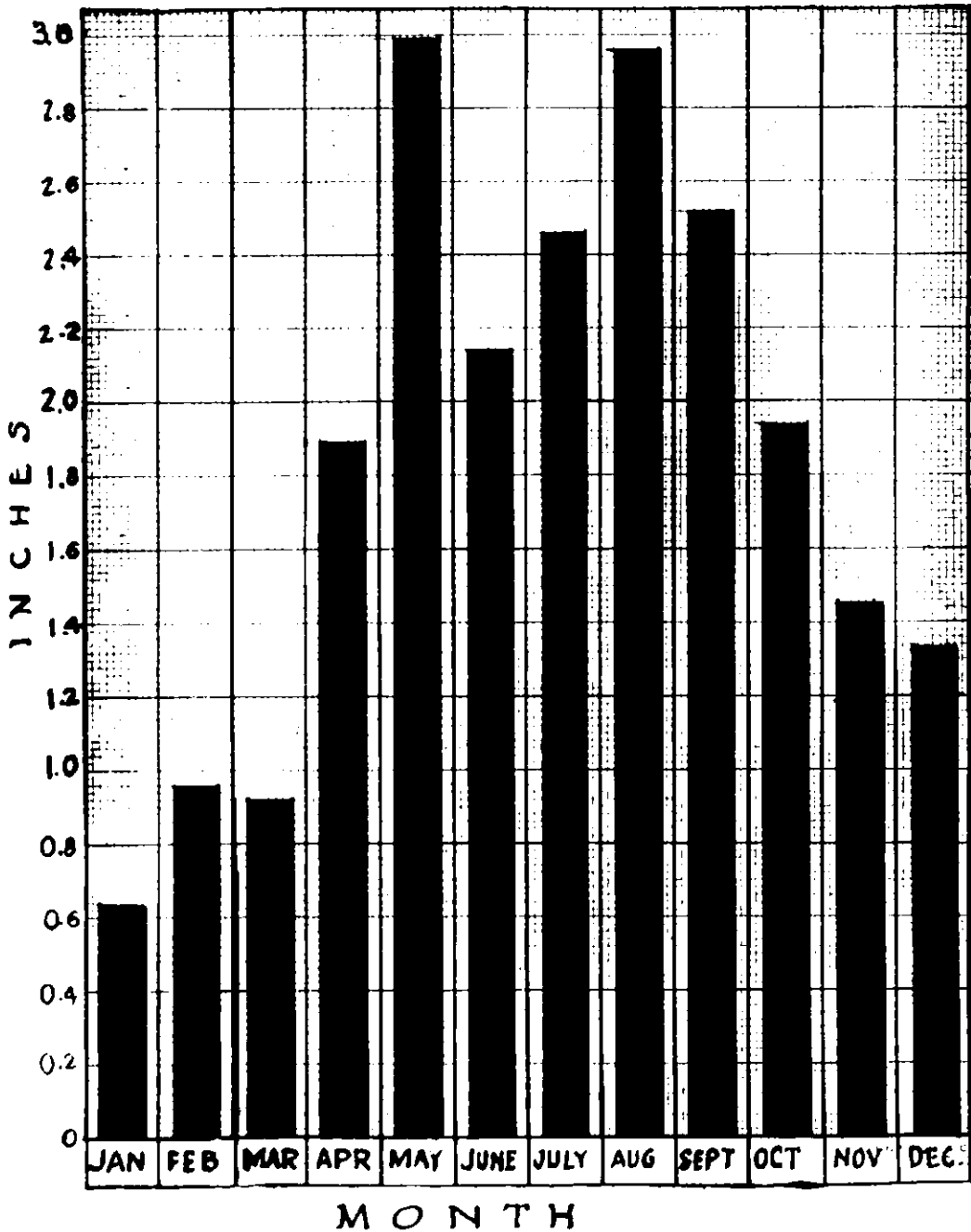


Figure 1J

Table 6 shows that while the annual precipitation averages about 22.75 inches, it is not very evenly distributed throughout the year. The rainfall is very light, for instance, during the months of December, January, February and March. If figures were available for the separate years by months, still greater variations would occur than are suggested by the table.

Table 7 shows more complete precipitation data taken from the United States Weather Bureau records at San Angelo, 70 miles north of Sonora, showing the monthly and annual precipitation for the years 1904 to 1920 inclusive. This table shows not only great variations from month to month on different years, but also a variation of from 8.29 inches in 1917 to as much as 40.88 inches in 1919. These figures immediately suggest the great problem which confronts the ranchman with reference to the carrying capacity of his ranges. One year he may have sufficient grass for 100 cows per section and another year the same range might be so dry that it would be over-stocked with 20 cows per section.

### *Clear and Cloudy Days*

TABLE 8<sup>30</sup>

Showing the total snowfall per year, the number of days during the year on which it rains, is cloudy, part cloudy, and clear, at San Angelo, Texas, 1911-1920.

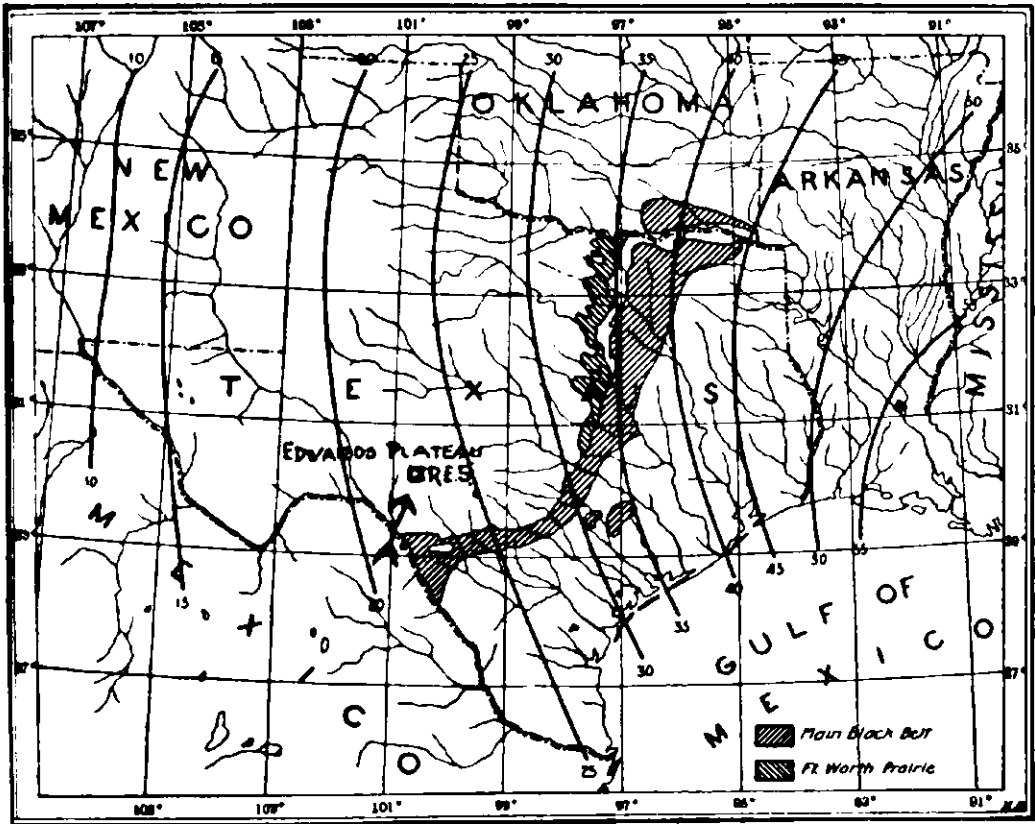
Year	Total snow-fall in inches	Number of rainy days	Number of cloudy days	Number of part cloudy days	Number of clear days
1911 .....	Tr.	45*	58*	98*	209*
1912 .....	Tr.	24*	51*	46*	250*
1913 .....	1.5	38*	51*	84*	199*
1914 .....	Tr.	41*	66*	106*	174*
1915 .....	5.0	37*	53*	86*	204*
1916 .....	0.0	28*	**	**	**
1917 .....	4.5	25*	64*	112*	184*
1918 .....	**	**	**	**	**
1919 .....	10.8	70*	120*	91*	137*
1920 .....	Tr.	41*	**	**	**

<sup>30</sup> Climatological Data, Texas Section, United States Weather Bureau, Annual Summaries, Government Printing Office, Washington, D. C.

\*Incomplete.

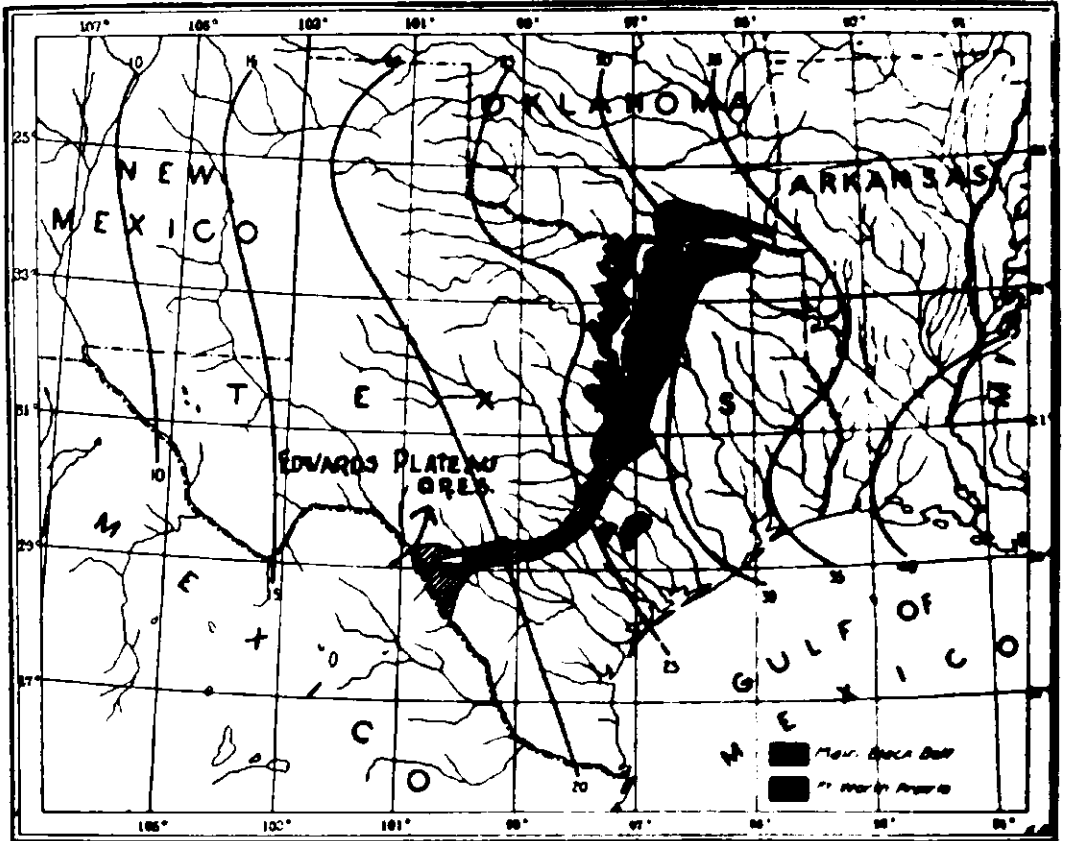
\*\*No records.





**LEGEND: □ RANCH EXPERIMENT STATION**

Figure 11. Map showing the average annual rainfall in the Edwards Plateau region. (Based upon records of the United States Weather Bureau, 1871 to 1908, inclusive).



LEGEND - □ RANCH EXPERIMENT STATION

Figure 12. Map showing seasonal rainfall in the Edwards Plateau region. (Precipitation during the crop-growing season, based upon records of the United States Weather Bureau, 1871 to 1908, inclusive).

TABLE 9<sup>31</sup>

Showing First and Last Killing Frosts, San Angelo, Texas, 1911-1920.

Last killing frost in spring		Year	First killing frost in autumn	
Date occurred	Temperature Degrees F.		Date occurred	Temperature Degrees F.
February 24	24	1911	October 23	30
March 23	30	1912	November 7	32
April 11	28	1913	October 20	35
April 8	33	1914	November 9	32
April 3	32	1915	November 27	22
April 9	31	1916	October 20	31
March 27	30	1917	October 19	31
March 18	29	1918	November 18	30
March 18	33	1919	November 12	30
April 12	34	1920	October 28	36

<sup>31</sup> Climatological Data, Texas Section, Annual Summaries 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920; United States Weather Bureau; B. Bunnemeyer Meteorologist, U. S. Weather Bureau, Houston, Texas; Government Printing Office, Washington, D. C.

*Temperatures*TABLE 10 <sup>32</sup>

Showing the Mean, Absolute Maximum and Absolute Minimum Monthly Temperatures at Sonora, Sutton County.

Month	Mean Degrees F.	Absolute maximum Degrees F.	Absolute minimum Degrees F.
Annual .....	64.4	106	5
January .....	48.3	85	5
February .....	48.2	96	6
March .....	60.0	97	20
April .....	64.8	101	28
May .....	72.2	99	37
June .....	77.2	105	50
July .....	79.6	105	46
August .....	80.3	106	52
September .....	75.3	104	36
October .....	64.1	99	23
November .....	55.0	88	12
December .....	47.3	84	7

*Evaporation*

In stating the efficiency of rainfall, one should always bear in mind its distribution through the year, and the rate of its evaporation. Kocher <sup>33</sup> says: "In the area surveyed the rate of evaporation is very high, and loss of moisture from this cause is practically continuous throughout the year. For this reason a rainfall which would be considered ample for dry farming in

<sup>32</sup> A. E. Kocher and Party, "Reconnaissance Soil Survey of South-Central Texas," Bureau of Soils, United States Department of Agriculture, Washington, D. C. Government Printing Office, 1915; page 26.

<sup>33</sup> *Ibid.*, page 27.

more northern areas might be insufficient for crop needs here. The differences in the relative effectiveness of rainfall for the production of crops is shown by the fact that the rate of evaporation at San Antonio during the six months, April to September, inclusive, exceeds that for the same period in the Dakotas by 8 to 16 inches. On the high level plains in the northern part of the area, where winds are more constant and the air considerably drier, the rate of evaporation is still higher."

*Wind Velocity*

The wind velocity in this section is very high as compared with that of Eastern Texas and in fact most parts of the United states east of the Great Plains. This explains in part the relatively high rate of evaporation in Sutton County and also the extensive use of windmills for pumping water. If the wind velocity were as low as it is farther east, gasoline engines would have to be resorted to in providing livestock with water and the expense would be greatly increased. The following table gives the wind velocities at Del Rio, about 95 miles south of Sonora, but in the same general region:

TABLE 11 <sup>24</sup>  
Showing Wind Velocities at Del Rio, for 1920

Month	Run of wind during month in miles	Maximum velocity of wind reached during month in miles per hour	Average hourly velocity of winds for the month in miles per hour
Total .....	83,139	x	x
January .....	5,771	37	7.8
February .....	5,629	30	8.1
March .....	8,499	49	11.4
April .....	8,208	43	11.4
May .....	7,450	38	10.0
June .....	7,987	45	11.1
July .....	7,457	35	10.0
August .....	6,693	38	9.0
September .....	5,937	48	8.2
October .....	7,106	30	9.6
November .....	5,910	39	8.2
December .....	6,492	46	8.7

<sup>24</sup> Climatological Data, Weather Bureau, Texas Section, United States Department of Agriculture, Washington, D. C., 1920, by B. Bunnemeyer, Meteorologist, Houston, Texas.

NATIVE VEGETATION <sup>35</sup>

The predominating grass in Sutton County is the curly mesquite (*Hilaria cenchroides*), a grass which begins its growth earlier in the spring than Buffalo grass, and makes a thick, compact turf for summer grazing. It also has the quality of maturing or curing on the range, and, therefore, is of great value during drouthy periods and as a hold-over for winter. *Hilaria mutica*, erroneously called black grama, and *Hilaria jamesii*, are grasses seemingly well adapted to the heavier soil types, as they are most commonly found on the heavier clay soils. They possess, however, a coarser foliage and are not so readily relished by livestock as the curly mesquite, the gramas, and the Buffalo grass. They produce good growth, however, on the heavier soils and are especially valuable for winter grazing.

The grama grasses, or *Bouteloua* group, are probably of some importance on this range, the principal ones being blue grama (*Bouteloua oligostachya*), hairy grama (*B. hirsuta*), and side-oats grama (*B. curtipendula*). The grama grasses, particularly blue grama, are especially adapted to grazing, as they are known to withstand more trampling than other grasses. These also have the quality of maturing on the ground and forming valuable range feed reserves. The side-oats grama finds its way into rock crevices and other places more or less inaccessible and, therefore, provides a supplemental amount of grazing to that found on the more level areas. In fact, the grasses of the *Bouteloua* group are known to grow well on high arid plains and bench land, as well as on the more level stretches, a habit which makes them a valuable addition to the ranch.

The Buffalo grass (*Bulbilis dactyloides*) is a low, fine-leaved grass, very similar to Bermuda in rapid growth. It is found liberally mixed on the range with curly mesquite and other grasses, and is recognized as one of the best of fat-producing grasses. Its turf is closely interwoven and it bears an abundance of fine leaves. Like the curly mesquite and the blue grama, it also matures its leaves and provides an abundance of good grazing for periods of drouth and for winter grazing.

<sup>35</sup> No attempt is made to enumerate all the plants represented in the flora of Sutton County. An interesting description of the more important ones, from the grazier's standpoint, will be found in Farmers' Bulletin No. 72, by H. L. Bentley, entitled "Cattle Ranges of the Southwest." United States Department of Agriculture, Washington, D. C., Government Printing Office, 1898; pages 22-31.

The needle grass (*Aristida fasciculata*) forms a very valuable winter and early spring grass on the range. It possesses unusual drouth-resisting qualities and spreads rapidly from seed. It is one of the early pasture grasses and is perhaps more generally distributed than any other except mesquite. On maturing seed, however, it often becomes a nuisance, particularly to sheep and goats, because the seeds, which are tipped with barbs, work their way into the sheep's wool and the goat's hair and sometimes into the flesh. They get in the face and eyes of the animals, often making them blind.

The little blue-stem (*Andropogon scoparius*) seems to be pretty well distributed over the lowlands and is often found on the higher levels. Its foliage is not so much relished by livestock as some of the other grasses mentioned, but, nevertheless, it forms a valuable addition to the range grasses.

A legume of some importance to the range throughout Sutton County is a wild bean (*Strophostyles helvola*), a small trailing, widely branching, hairy legume which grows in remarkable abundance on the ranges. It is seldom noticed, however, except around shrubs and thickets where protection is afforded it from livestock. It undoubtedly adds considerably to the grazing value of the range, being eagerly sought after by all types of livestock.

The live-oak (*Quercus virginiana*) in Sutton County often forms dense clumps and thickets of low-growing brush. It occupies 25 to 75 per cent. of the area and forms a most important and valuable browsing for sheep, goats, and cattle. Its value to the country is inestimable. The livestock in this section went through the drouth in better condition and with fewer losses than was the case farther north where there was no live-oak brush for browsing. The live-oak not only furnishes browsing, but nearly every year produces good crops of acorns which are known to have a high feeding value and are utilized by sheep, goats, and hogs. In certain areas where individual oaks have found less competition, they have grown into trees of considerable size and are the principal shade trees of the section.

The shin-oaks, of which two species are common, (*Quercus gambelii* and *Q. undulata*), afford both brush and acorns for sheep, goats and hogs.

The mesquite tree (*Prosopis glandulosa*) is found in the

flats both on the tablelands and in the valleys. It produces a crop of beans which are very nourishing and very much relished by livestock.

Other plants of the arid region, found in this county, are sotol (*Dasylirion leiophyllum* and *D. wheeleri*) found very limitedly, and sachahuista (*Nolina lindeheimerina*, *N. terana* and *N. erumpens*). Many other plants of economic importance might be mentioned, but since no complete botanical survey has been made of this particular county, they will not be considered at this time.



Figure 13. This view was photographed May 25, 1919, before any stock had been grazed on this land that year. Note the different growths—the grass, the weeds, the sacahuista and the live-oak brush. Ranch Experiment Station on Sutton-Edwards Counties line.



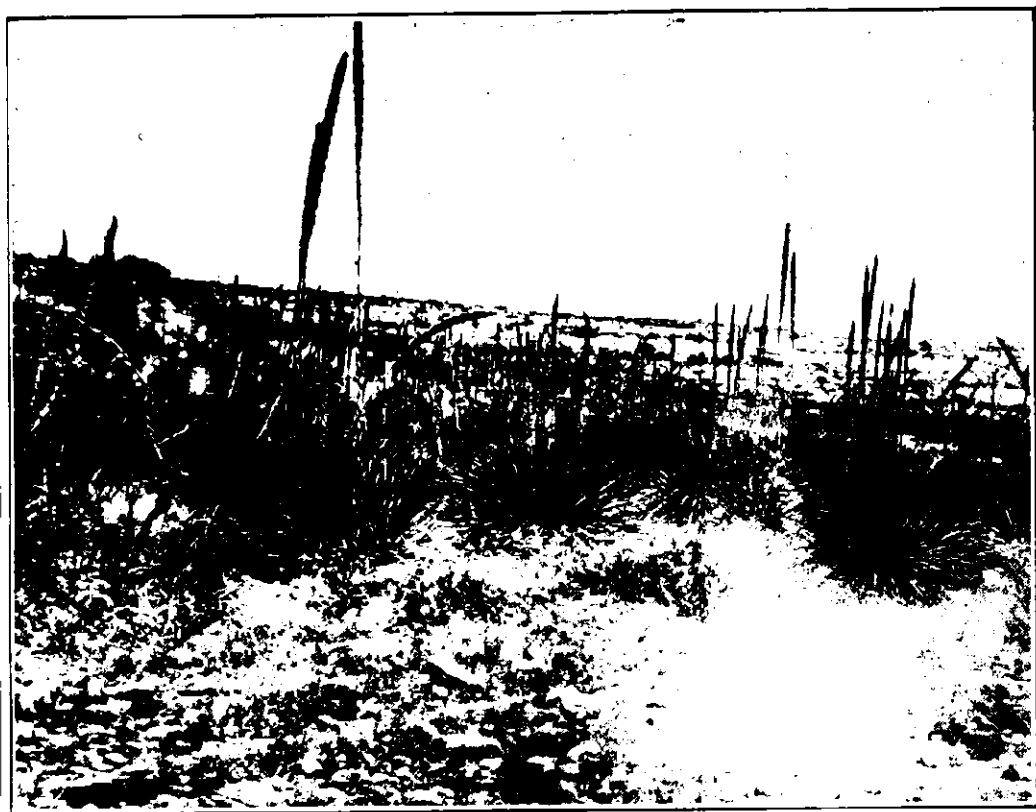


Figure 14. Close-up view of sotol, fifty miles South of Sonora, in the Devils River region. This is good sheep and goat range.

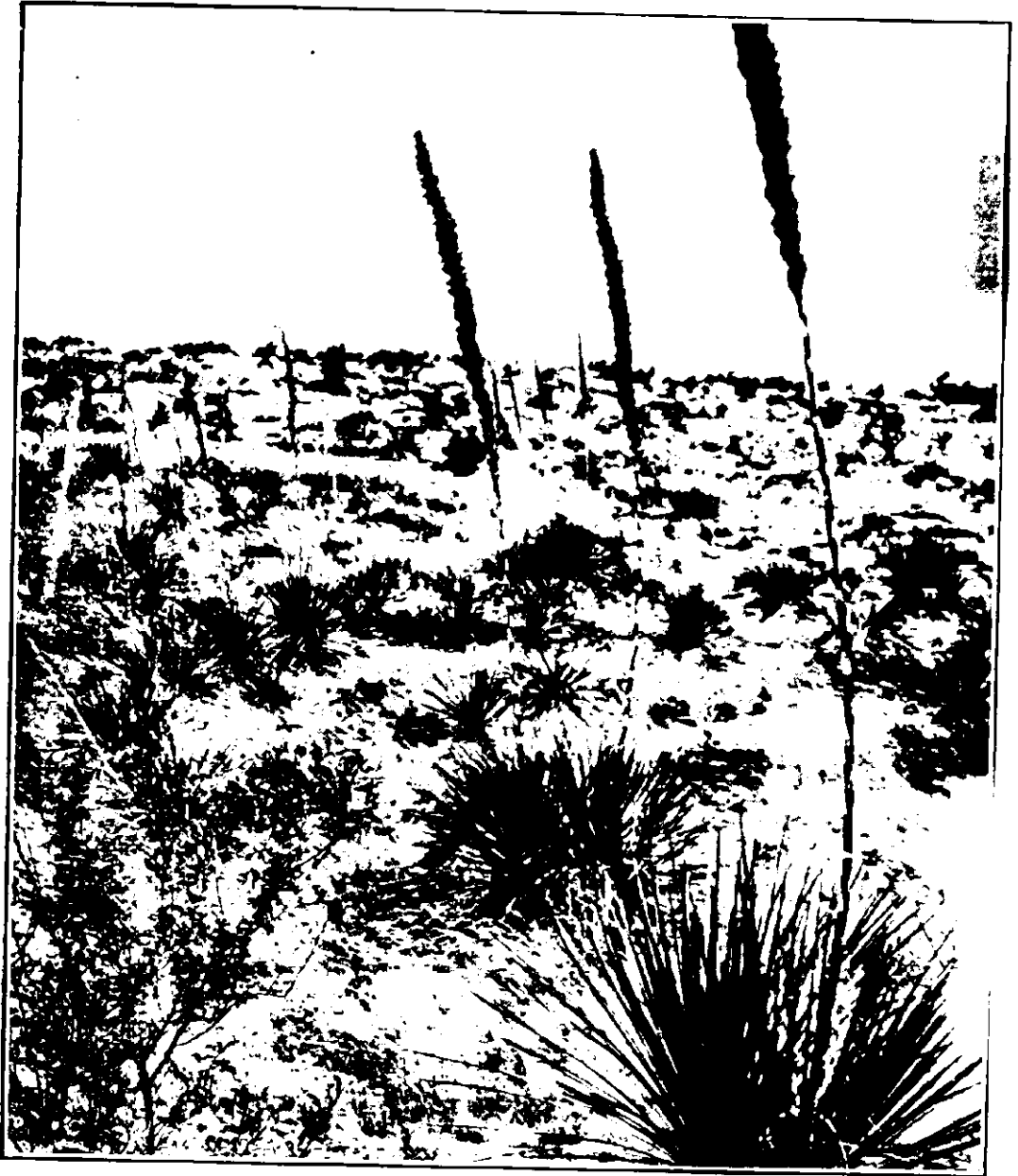


Figure 15. Sotol in bloom, close view, July 15, 1920. Sotol is a reserve feed for livestock in times of drouth. This is typical of much of the ranges on the "draws" of the Devils River.

## CHAPTER IV

# HISTORICAL SKETCH OF RANCHING IN SUTTON COUNTY

### SOME HISTORICAL CLASSIFICATIONS

The history of ranching in Sutton County may be divided into three rather distinct historic periods if due allowance is made for the necessary overlapping or the merging of one into the other. The first classification, based on tenure, is as follows:

1. The period of free grass.
  - (1) The open range; grass free, that is, no rental is paid.
  - (2) Fenced range, grass still free.
2. The period of the leased range.
  - (1) Fenced range, grass predominantly leased, but part free.
3. The period of private ownership.
  - (1) Grass predominantly owned, part leased and part free.
  - (2) Grass part owned and part leased.
  - (3) Grass all privately owned and operated either by owner or by lessee.

Similarly, we may divide the history of the area into three different stages of development based on the characteristics of the prevailing type of enterprise:

1. The hunting stage.
  - (1) Indian times.
  - (2) White hunters.
2. The pastoral stage.
  - (1) Occasional drifting bands of sheep. An emergency range.
  - (2) The "flock-masters," locally known as "drifters," grazing the county as a regular business.
3. The stage of permanent ranching.
  - (1) Period of provision of permanent water, dirt tanks and deep wells.
  - (2) Period of enclosed range with barbed wire.
  - (3) Period of scientific ranching with wolf-proof fence, an efficient organization and scientific breeding.

*The Free Grass Period*

*Indian Times:* The Edwards Plateau, of which Sutton County is a part, was the hunting ground of the Indians until about 1877. Owing to the fact that this Plateau was unwatered except in rainy seasons, the Indians used it as a hunting ground rather than as a place of abode. They visited it usually in the spring and fall after the rains. The weather records show that the winters were usually dry, and that the best rains occurred in May and August or September, with an intervening drouth sometime in the summer. They habitually burned off the grass in the spring and fall preceding the rains to keep down the underbrush, to provide green grazing for game and their ponies and to improve the hunting.

The transition from Indian occupancy to that of the white man was rather easily effected in this section. To the north and east were the Indian forts on the San Saba and the Conchos,<sup>36</sup> which did the work of driving out the Indians before the white man began to occupy the Plateau. For a year or two following the removal of the Indians, white men visited this section to hunt turkey, deer, antelope, bear, and sometimes the buffalo. There were numerous mustang ponies running wild in this section until eventually killed off by the stockmen.

*The Law of the Range:* In the early days of the Edwards Plateau, as in practically all other range sections, the limited utilization of the range preceded organized local government. In the absence of such government, the grazier developed a body of unwritten rules of human action known as "The law of the range." Even after the local government was set up its power was weak, or else those who were supposed to enforce the laws of the State favored the sway of "The law of the range." The ranchmen often felt that they could come nearer meting out justice by judging the merits of the case according to the rules which had grown up among themselves as the country was occupied, than by statutes made chiefly by the people residing in

---

<sup>36</sup> Fort McKavett near the headwaters of the San Saba, and Fort Concho near the headwaters of the Conchos.

other sections and who knew nothing of local conditions. On the average, they were as law-abiding people as the citizens of other sections. They understood that statutory law, like common law, is based on common sense, and to the extent that statutory law was not enforced, they took recourse to common sense in the adjustment of their relations until their population was sufficient to organize local county government and secure the enforcement of State laws. Notwithstanding what may be said against "The law of the range," it must be admitted that in the pioneer days of the West it was better by far than the chaotic condition of no law at all.

According to "The law of the range" the first comer had first rights. It arose somewhat as follows: The "drifters" began to drift about with their flocks and sooner or later they bumped into each other. Then arose agreements as to each one's rights and duties. Each man agreed that the other was entitled to a sufficient amount of range to maintain his breeding stock and its increase up to the proper marketing age. The agreements regarding such matters as the partition of the range and the use of water became property rights and were frequently bought and sold as land is sold today. Once a man's range rights were determined, they were respected by all. The owners of these rights felt that they had priority claims in any disposition of the lands which they occupied.

To the pioneers free grass was an essential element in "The law of the range." It meant that no rental should be paid for grazing rights. It did not mean free grass in the sense of common property, that is, grass which any one had a right to use at will along with all of his neighbors. It meant that the grass was to be free to the first comer who secured his range by getting there first. This is quite a different idea of free grass from that entertained at one time by our New England colonists with reference to their "commons." On these commons every citizen had a right to graze his livestock. The result was the overgrazing of the commons, just as the western ranges were overstocked when people who did not respect "The law of the range" came in.

*The Pastoral Stage:* Ordinarily, grazing has been the pioneer industry. The usual order of entry into a new section has been cattle first and sheep next. Cattle may be driven a

greater distance to market, and they thrive with less care than sheep. In the history of Sutton County, however, this order has been reversed. This may possibly be explained by the dryness of the Edwards Plateau coupled with the fact that sheep can go without water, that is, they can subsist on the water in the grasses and weeds longer than cattle. Otherwise the history of the development of ranching in Sutton County is quite similar to that in other sections.

Owing to the absence of running streams, this section was not entered for sometime after the ranges along the Conchos to the north, the San Saba to the northeast, and the Llanos to the east and southeast had been stocked. When the sheepmen began to crowd each other along these streams, they began to seek new grazing grounds. The natural outlet was the Edwards Plateau. Lack of permanent water on the Plateau, however, caused it to be used at first as a sort of an emergency grazing ground for the sheepmen. The period during which it was thus utilized may be termed the pastoral stage in the development of this region.

#### *Methods of Handling Sheep on Free Grass*

Old-timers still relate how the bands of sheep were handled in those days. A sheepman residing farther east, let us say, in Coryell, Williamson, Hamilton, or San Saba County, would start out with one or more bands of sheep of 1500 each. For two bands, or 3000 sheep in all, the outfit consisted of the following: One white man as sheep-rustler, that is, flock-master; two Mexican herders; a "chuck" wagon with provisions, bedding, cooking utensils, and so forth; three horses, including a team and one extra riding horse; and one cook, who was also the wagoner. In the back end of the "chuck" wagon stood a kind of cupboard with a door which when opened and propped up by a stick for a leg made a table for the outfit to eat on. The "drifter" held his flocks on the grazing lands along one of the streams to the east until after shearing time and the rains had made the grass out on the Plateau bright and green; then he started out following the succulent grasses and weeds until he had meandered about and returned to the starting point or some other place where the sheep might be sheared or marketed.

The length of time that this outfit could remain out on the Plateau depended largely on the succulence of the grass. If the grass dried up and no water was available, the sheep would famish. The fact that sheep lived on the succulent grasses and weeds sometimes for months without any other water was the source of the stories that went abroad to the effect that sheep could live without water. The fact is, sheep must have water the same as any other animal and in this case they got it from the green grasses and weeds.

### *The Beginnings of Permanent Ranching*

The first important change in the utilization of these grazing grounds occurred in the late 80's when wells began to be bored. Thereafter, the section on which the well was located was either leased with the right of purchase or else was bought outright from the State. Under the new arrangement the "rustler" stayed at the well and the sheep were divided into bands of about 1500 as before and each band was put under a Mexican herder equipped with an "A" tent, a barrel of water, and a light camp outfit. Each herder was given a band of sheep which was put out two or more miles from the well and herded on the grass. Sometimes the wells were held in partnership, one belonging to three or four different sheepmen. This method of handling sheep bordered onto failure. Bringing the sheep in to water wore out the range around the wells. The sheep were brought in every two or three days in the summer and less often in winter. They did well during wet years, but the losses were great during the drouths. The lambs were stunted because the strong sheep stayed in front and the poor and the young lagged behind and gradually starved for lack of grazing. Scab could not be controlled under a system of herding and partnership watering places so this disease brought additional heavy losses. Dipping vats were used, but there was no way to prevent reinfection. Even the Mexican herders carried the scab and reinfected the flocks. The herders lost sheep, and wolves got into the flocks. Then, too, there was lots of stealing going on.

When wells were first bored in this section many of the stockmen were of the opinion that cattle would not thrive on well-water. They considered a running stream essential to suc-

cessful cattle raising. This prejudice was probably due in part to the fact that primitive cattle raising had always been conducted along running streams, and in part to the fact that the first wells bored on the Plateau were of limited capacity, due to the small size of the pipe used and occasional lulls in the wind. Working under so many disadvantages, it is not to be wondered that the first comers brought in sheep before they did cattle, and that for years they considered the Edwards Plateau poorly adapted to cattle.

The occupation of this section by stockmen might even have been delayed until a more recent date had it not been for the rise in the price of livestock along in the 80's, due to the demand for Texas cattle in the northern markets. The opening up of the western grazing grounds from Texas to Canada created a great demand for Texas cattle for the purpose of stocking the northern ranges. The extension of the Texas & Pacific Railroad from Fort Worth to El Paso in the early 80's precipitated a period of wild speculation in the livestock business. It was soon found that cattle did as well on well-water—if they got enough of it—as on water from a running stream. As soon as the wells were properly equipped and distributed, and storage facilities were provided, this area was rapidly stocked with cattle, as well as sheep and goats.

## THE PERIOD OF THE LEASED RANGE

### *The Introduction of Wire Fencing*

As the ranges became stocked, the older ranchmen saw that if they expected to continue in the business some means must be devised whereby they might continue to hold a certain amount of their range for private use. Thanks to the introduction of barbed wire fencing along in the 70's, a comparatively cheap and easy means of controlling one's range was available. The first fences were built in Sutton County about 1889. They simplified herding, enabled one better to control his range, and reduced expenses. It was the principal factor in bringing on the transition from the free grass period to that of the leased range.

Barbed wire was first used in the West by stockmen to fence large bodies of land, with little reference to whom the land



belonged. These "outlaw" fences, as they were dubbed by the newcomers, served two purposes. In the first place, they took the place of the "line-riders," that is, cowboys who rode the lines and kept their employer's livestock on its proper range, and in the second place, they served as a formal notice to the rest of the world to keep out. Sheepmen, still accustomed to moving their flocks freely over the range, upon coming up to one of these fences, would be told, "You will have to keep out of here, this is Colonel 'So and So's land." Such instances were reported to the State Land Office at Austin. The Commissioner of General Land Office sent out agents with bands of sheep, and when told that "This is Colonel So and So's land," they would reply, "Well I am glad to know it; you owe the State (so many) thousand dollars rental." These "outlaw" fences were at most only temporary structures and were soon removed. Fence troubles of this character, while common throughout the West in the 80's, were of no significance in Sutton County.

In Sutton County sentiment was rather strong in the early days for the perpetuation of free grass, but as soon as the stockman fenced the range he began to fear that an outsider might come in and lease a part of it out from under him. Eventually one man leased his range from its several owners and immediately the others leased theirs in self-defense. Soon the entire county had passed from free grass to leased range. As long as the ranges were leased, three-wire fences of rather temporary construction were used. It is obvious, therefore, that under these conditions sheep had to be herded as they could not be held by the kind of barbed wire fence then in use.

## THE PERIOD OF PRIVATE OWNERSHIP

The period of the leased range was brought to a close during the years 1904, 1905 and 1906, when buying became general. According to "The law of the range", the lessee had first rights at buying the range which he controlled, but according to the law of the State he could take up only four, or at most eight, sections. In those days, no man running large herds on extensive ranges could conceive of contenting himself or of making a living on a four-section ranch. Here arose a conflict between statutory law and local public sentiment. The fact was, there

was no certainty of his having even a four-section ranch in one body, for the reason that alternate sections were privately owned either by railroads or absentee individuals. If it were possible for him to lease the alternate sections he might have an eight-section ranch by buying four sections of State land, but in those days an eight-section ranch was considered too small. The stockmen felt that their having gone west and developed the country gave them a better right to continue their business on a suitable scale than to allow outsiders to come in, take up the land and break up the ranches, only to sell out later to a stockman. They had little faith in the sincerity of the so-called "settlers," whom they considered not to be settlers in fact, but rather "bonus hunters" who had no thought and, more often than otherwise, no funds with which to conduct a successful farming business.

The ranchmen were thoroughly convinced that the country was too rough, rocky and dry to be farmed at all. The practical result of it all was that each ranchman took up his full quota as the law prescribed, either leased, bought or otherwise occupied the alternate sections and welcomed his cowboys, herders and laborers to file on the remaining sections of State land within his range. In many cases these purchasers complied with the requirements as to settlement and later deeded the land to the ranchman for some satisfactory consideration. Instead of the ranches being permanently reduced to four or eight sections, therefore, they gradually returned to normal size. It was a case in which the statutory law provided a holding too small for the type of ranching which prevailed. Economic law required a larger holding, and this backed up by strong local sentiment—"The law of the range"—prevailed.

#### *The Introduction of Wolf-Proof Fences*

As soon as the lands became privately owned the stockmen became interested, for the first time, in developing and permanently equipping their holdings. It was evident that fences would have to be rebuilt, and while they were doing this they considered that they might as well put up a permanent fence of a type of the greatest usefulness. Accordingly, they began to build wolf-proof fences along about 1910. This fence was constructed

of woven wire with six-inch mesh, 42 to 52 inches high, on cedar posts, with a barbed wire on the ground—sometimes one on both sides of the posts at the ground—and two or three barbed wires above the woven wire. When this fence was properly constructed the wolves were rather effectively fenced out and those remaining on the inside could be killed. The ranchmen hailed the introduction of the wolf-proof fence as one of the most important economic events in the history of the section.

### *Some Advantages of Wolf-Proof Fences*

Some of the advantages gained by the construction of these fences are enumerated as follows:

1. They eliminate herding.
2. They facilitate livestock management.
3. They enable one to control disease, for instance, the sheepman to control scab. They eliminate the herders who were themselves often conveyors of scab.
4. They enable one better to conserve and to utilize the desirable grasses, brushes and weeds on his range, and to eliminate those which are undesirable. In other words, they facilitate range management. Each animal has the same advantage as all others in the matter of grazing; one is as fat as the other.
5. They eliminate loss from coyotes and wolves. They are very convenient in controlling breeding; in separating bulls from cows; in weaning calves, and so forth. One can regulate the time of breeding and the dropping of calves, lambs, and the like, so that they will come at a convenient season. They help control the matter of stealing; herders were very irresponsible, and were sometimes the accomplices of the thieves.

Mr. J. A. Cawthorn, who has ranched in Sutton County from 1885 to the present time, says: "No one can imagine the great advantages of wolf-proof fencing unless he has previously had to herd."

### *Present Tendencies*

During the seventeen years which have elapsed since the leasing system gave way to private ownership, the stockmen

have put in the best of wolf-proof fences, bored wells and built reservoirs sufficient in number to water the country, and they have introduced blooded animals and otherwise improved their herds of cattle and their flocks of sheep and goats until they are able to boast of having some of the best in the land. Notwithstanding the fact that their country is a long distance from a railroad and otherwise confronted with many weighty problems, it is a progressive one and promises to remain one of the greatest permanent ranching regions in the United States.

CHAPTER V  
RANCH LANDS  
LAND DEFINED

*Legal Definition*

Tiedeman<sup>37</sup> defines land as follows: "Land is the soil of the earth, and includes everything erected upon its surface or which is buried beneath it. It extends in theory indefinitely upward, . . . and downward. . . ." This is a jurist's definition of land and is given from the standpoint of *land as property*. The economist's definition is not so extensive in its sway and is given from the standpoint of *land as one of the factors of production*. Professor Marshall<sup>38</sup> says: "By land is meant the material and the forces which nature gives freely for man's aid, in land and water, in air and light and heat." Such a definition obviously includes neither the fixed equipments, such as buildings, fences, and waterworks, nor the improvements made on the land, such as clearing, draining, and terracing, since these are usually classed by the economists as *capital*. Some economists, however, have considered those improvements on the land which tend to make it ready for use as becoming a part of the land itself. Others even consider land as capital.

Professor Ely,<sup>39</sup> who has undoubtedly given more thought to the economic concept of land than any other authority, says: "Land means nature as one of the two original factors in production, the other being labor, while capital, the third factor in the category . . . is a derived factor resulting from the action of labor upon nature." This authority points out the fact that land has certain characteristics not common to other goods. He enumerates thirteen of these, the first six of which will serve our present purpose. These are as follows:

---

<sup>37</sup> Christopher G. Tiedeman, "Real Property," Third Edition, Saint Louis, Missouri, 1906.

<sup>38</sup> Marshall, Alfred, "Principles of Economics," the Macmillan Company, London, 1916; page 138.

<sup>39</sup> Richard T. Ely, Professor of Economics, University of Wisconsin, Madison, Wisconsin; lectures on Land Economics.

- “1. Land is something ready-made;
2. It is peculiarly limited in quantity so far as the available supply is concerned;
3. It has graduations in fertility and situation, these graduations being such in degree as to make them a peculiarity of land;
4. The peculiar relation of land supply to . . . population;
5. The immobility of land;
6. The relative and even the absolute permanency of land.”

### LAND CLASSIFICATION

Obviously, there is little in general that can be said about land as an economic concept. Land is so wide in extent, so varied in its qualities and uses, and so intimately interwoven into the life of all humanity that it is necessary for one to classify land in accordance with several viewpoints, depending upon the characteristics with which one is dealing. Professor Ely calls attention to a number of possible classifications of land. Some of the more important of these are those based on water supply, such as humid land, semi-arid land, and arid land. Others are based on use, such as agricultural land, forest land, and mining land. Still other classifications may be made, but present purposes will be served if the writers confine themselves to the classification of land into agricultural and non-agricultural and further delimit the discussion to an analysis of agricultural lands. These lands may be sub-divided in a number of ways, such as, for example, humid lands and arid lands, irrigable and non-irrigable, tillable and non-tillable, but present purposes will be adequately served if the writers sub-divide agricultural lands into farm lands and ranch lands, and confine themselves primarily to an analysis of the latter. These lands include, on the one hand, all those which are predominantly too rough, rocky, stony, dry, broken or otherwise unsuited for cultivation and, on the other hand, all those potential farm lands which are too far from market or else not needed for cultivation at the present time.

#### *Types of Ranch Lands*

There are two types of ranch land based on the relative

permanency of the use of those lands. There are lands which are only temporarily devoted to grazing. These lands are utilized by the ranchman either because they are not socially required for crop production, or because they are too far from the market to be profitably utilized for this purpose. For the lack of an adequate demand for the potential product of these lands, they are temporarily submarginal farm lands. They are utilized by the grazier until the farmer, economically speaking, is ready to take them over.

The second division is that of permanent ranch lands. These lands are permanently submarginal farm lands. The bulk of these lands, by virtue of their being too rough, rocky, stony, broken, or dry, are wholly unsuited to crop-farming, or to stock-farming enterprises. They may be sub-divided under three heads, as follows: (1) Land wholly non-tillable. This group, as will be shown, comprises the greater part of the permanent ranch lands of the country. (2) Tillable lands still in grass. (3) Cultivated lands. The two latter divisions of permanent ranch lands are so classed because they are found in such small and so widely distributed "patches" that they do not furnish enough farming land in a body even to meet the requirements of stock-farming. Where these small areas are farmed at all, they are used primarily as a sort of "first aid" to the ranch business.

Ranch lands may also be differentiated on the basis of the length of time they are grazed, into year-long-range land, summer-range land, and winter-range land. The year-long-range lands are found primarily in the Southwest. Livestock may be grazed on these ranges the entire year, as is commonly done in Texas. The summer ranges are those which furnish satisfactory grazing chiefly in the summer months. Some of the summer ranges are located in the forest reserves of the mountain ranges. They are unfitted for year-long grazing usually because they are too cold, or because the ground is covered with snow. Winter grazing is the term applied to the grazing found on the high level plains and plateaus adjacent to the mountains in the West.

Ranch lands form no exception to the economist's definition of land in general. They constitute the natural resources of the ranch. They are the nature factor used in livestock production on the ranges. The other factors of production, labor, capital

and managerial ability, are demanded, but not in the same proportions as in the use of farming lands. Ranch lands may be formally defined, therefore, as *all those lands which are utilized to best economic advantage when devoted primarily to grazing rather than to cultivated crop production*. This does not mean that some land may not be cultivated. In fact, frequently there is some cultivated land, but as long as the land in cultivation is used as an adjunct of the ranch business, it may be considered as ranch land. The chief purpose of such cultivated land is to furnish an emergency feed supply for sick and weak animals, or for work-stock.

### THE GRADES OF LAND

While land classification is a method of grouping lands according to their fundamental characteristics and uses, the grading of land is a process of grouping the different types within a class according to their relative excellence. Lands, for example, may be classified as agricultural land, forest land, mining land, and so forth, but it is impossible to judge the excellence of these different classes of land for their respective uses by a single standard. The agricultural land, for example, cannot be judged by the same standards as mining lands or forest lands. For agricultural purposes a given tract may be considered first grade, while from the standpoint of mining or forestry, it may be worthless. Grades, then, are the means of differentiating the qualities of land within a given class.

It may happen, however, that land may be placed in two or more classes. Land, for example, may be potentially both forest and agricultural land. In that case, it would be graded from two different standpoints. Such land may be, for example, No. 1, forest land, and No. 3, agricultural land. Whether it would actually be used for forestry or for agriculture would depend not upon its position in the two different grades, but rather upon whether No. 1, forest land, or No. 3, agricultural land, yields the greater net product.

Inasmuch as this study is concerned primarily with grazing lands, the discussion will be narrowed to a consideration of the grades of ranch lands and the factors determining them.



### *The Grades of Ranch Land*

*The grades of ranch land are determined by a comparison of the net values of their products.*<sup>40</sup> Other factors being equal, these grades are dependent upon the productivity of the land and its accessibility to the market. Accordingly, grade No. 1 ranch land, other things being equal, is that land possessing the highest carrying capacity and being nearest to the markets; grade No. 2, next; grade No. 3, next; and so on, while the last or lowest grade would be that land having the lowest carrying capacity and being located farthest from the market. The land of the greatest carrying capacity, that is, the most productive land, however, is not always nearest the markets. It is necessary, therefore, to give separate consideration to these two factors.

*Productivity of Ranch Lands:* The characteristics determining the productivity of ranch lands are the quantity, quality, variety and constancy of vegetation produced and the protection afforded. The quantity of vegetation in a ranch country is measured in terms of percentages of cover. Thus, from the standpoint of quantity of vegetation, the best land is that which has 100 per cent. cover.

All vegetation grown on the range is not of equal value for forage purposes. The quality of the vegetation is determined by its nutritive value and its palatability. From this standpoint, the best land is that which produces a cover of the highest nutritive value and palatability.

The ranchman depends on his range to furnish his livestock, as nearly as possible, a balanced ration. It is impossible to find a single plant which furnishes all the elements desired by range livestock. Moreover, different forage crops do not thrive equally well under varying weather conditions. Some plants make their best growth in the early spring, a few do best in the summer and fall, and a few are primarily winter growers. The best land from the standpoint of variety of cover is that land which furnishes the greatest variety of desirable forage, most advantageously distributed throughout the grazing period.

<sup>40</sup> It must be clearly understood that under this head the writers are discussing productivity of the land factor only. They appreciate the contribution of the other productive factors on the ranch—labor, equipment and managerial ability—but these factors do not enter into the discussion here. They may themselves be graded on the basis of productivity, the same as land.

Much of the ranch country is subject to wide fluctuations in the amount of vegetation produced from year to year, due to climatic variations. It is not always possible for the ranchman to utilize 100 per cent. of the vegetative cover, especially on good years following years of drouth. Stockmen are, of course, forced to sell off surplus livestock on bad years, but they try, however, to make as complete a utilization as possible of surplus grass on good years by bringing in surplus livestock from other sections. This practice, although an effort toward economy, is a very dangerous one. It often results in over-stocking the ranch on average years following good years, and bringing ruin on succeeding bad years. The best ranch land, therefore, from the standpoint of continuity of grazing, is that whose carrying capacity most nearly approximates the normal.

The degree of natural protection afforded has an appreciable influence in determining the carrying capacity, or affecting the productivity of the ranch. Not only the vegetation, but the animals themselves do better when accorded such protection.

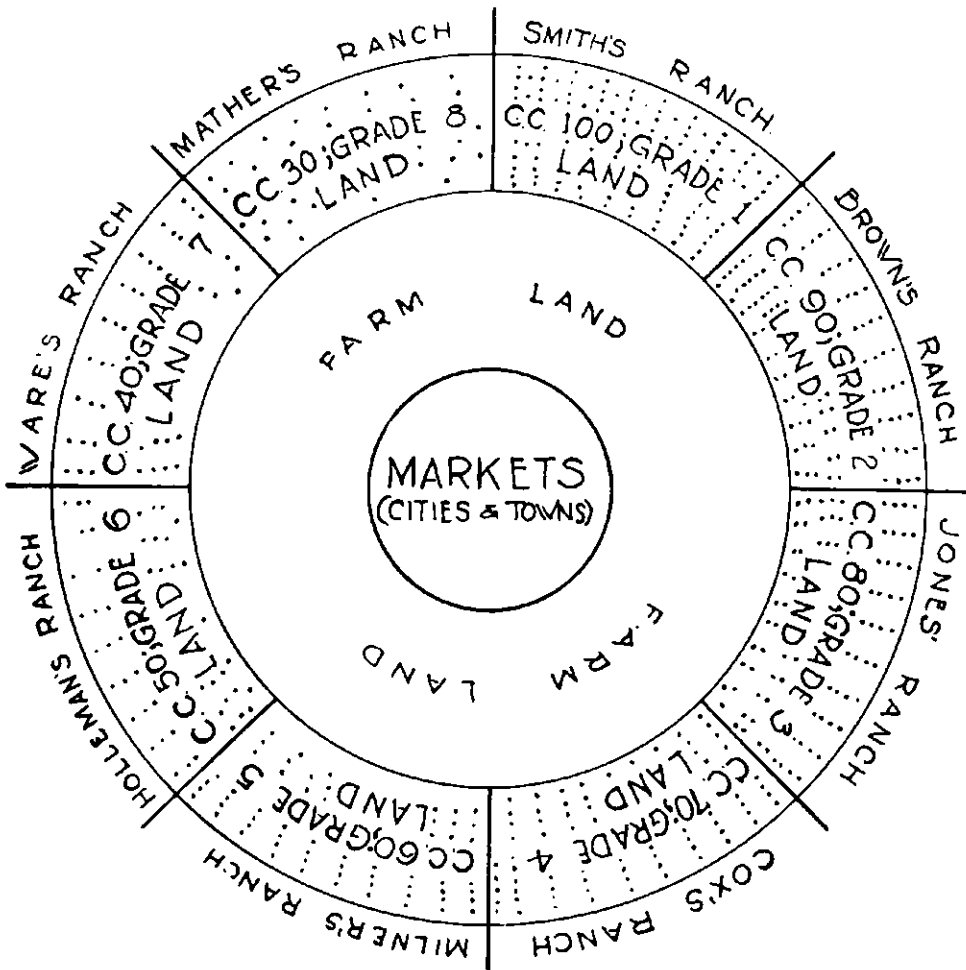
The highest grade of ranch land from the standpoint of productivity is that land having the highest percentage of cover, the best quality of cover, the greatest variety of cover best distributed throughout the grazing period, the cover that has the least variation in its productivity from year to year, and the range that offers the proper amount of natural protection.

The productivity of the ranch is also influenced by a number of factors as, for example, the amount, quality and distribution of the stock-water. These factors are emphasized later on under carrying capacity. When all the other factors of production are disregarded, except land, as in this discussion, for the moment, the effect of *distance from the markets* is eliminated, the grades of ranch land are determined directly by the productivity of the land factor.

*Distance from the Markets:* In the study of the effect of *productivity* on the grades of land, it was necessary to eliminate for the time-being the idea of distance from the markets by assuming all the lands to be equally accessible to market. Likewise, in considering the influence of *distance from market* on grades of land, it is necessary to eliminate all variations in productivity by assuming for the moment that all ranch lands are

uniformly productive. Von Thunen<sup>41</sup> gives an excellent illustration of the effect of distance from the market by assuming a soil of perfectly uniform fertility and not traversed by any form of improved transportation. He goes on to show, somewhat as

EFFECT OF PRODUCTIVITY ON THE GRADES OF LAND



*Note: CC = Carrying Capacity  
 Each Dot = One unit of carrying capacity.  
 In order to eliminate the effect of DISTANCE from MARKETS on the grades of land, in this illustration, it is presumed that all ranches are equidistant from the markets.*

Figure 16

41 J. H. Von Thunen, "Der Isolierte Staat," Jena, Verlag von Gustav Fischer, 1921.

illustrated in Figure 16, that the most productive land, the net value of its products considered, lies nearest the city, the next most next, the next most next, and so on. On this basis, ranch lands, by virtue of the fact that livestock, wool and mohair may be taken long distances to market, occupy the territory most remote from the market.

Generally speaking, Von Thunen<sup>42</sup> presented but two classes of land, namely, farm land and ranch land. He placed the farm lands between the ranch lands and the market city, and graded them on the basis of bulk, perishability and value of products. He did not divide up ranch land as a class into grades. Like the farm lands, he might also have graded the ranch lands into grades 1, 2, 3, and so on, depending upon their relative distances from the market. No. 1 ranch land would be that ranch land which is nearest to the market, No. 2 next, No. 3 next and so on.

In pioneer times when the ranges were publicly owned and entirely unfenced, the matter of distance from market was not an important factor in the ranch business for the reason that ranchmen could slowly graze their cattle to market and maintain them, if not fatten them, on the way. In modern times, however, when either the ranges are both privately owned and fenced, or else cut off from the markets by privately owned and fenced farm lands, the matter of distance from market becomes a very important factor in determining the net productivity of ranches. The expenses of marketing come out of the gross product of the ranch and the greater these expenses the less the net product. The difficulty and expense of marketing ranch products are greatly increased as the country settles up. The ranchmen whose lands are remote from shipping points must either drive their cattle for many miles through narrow lanes or drive them through other men's pastures, graze them on the other man's grass, and water them from the other man's water.

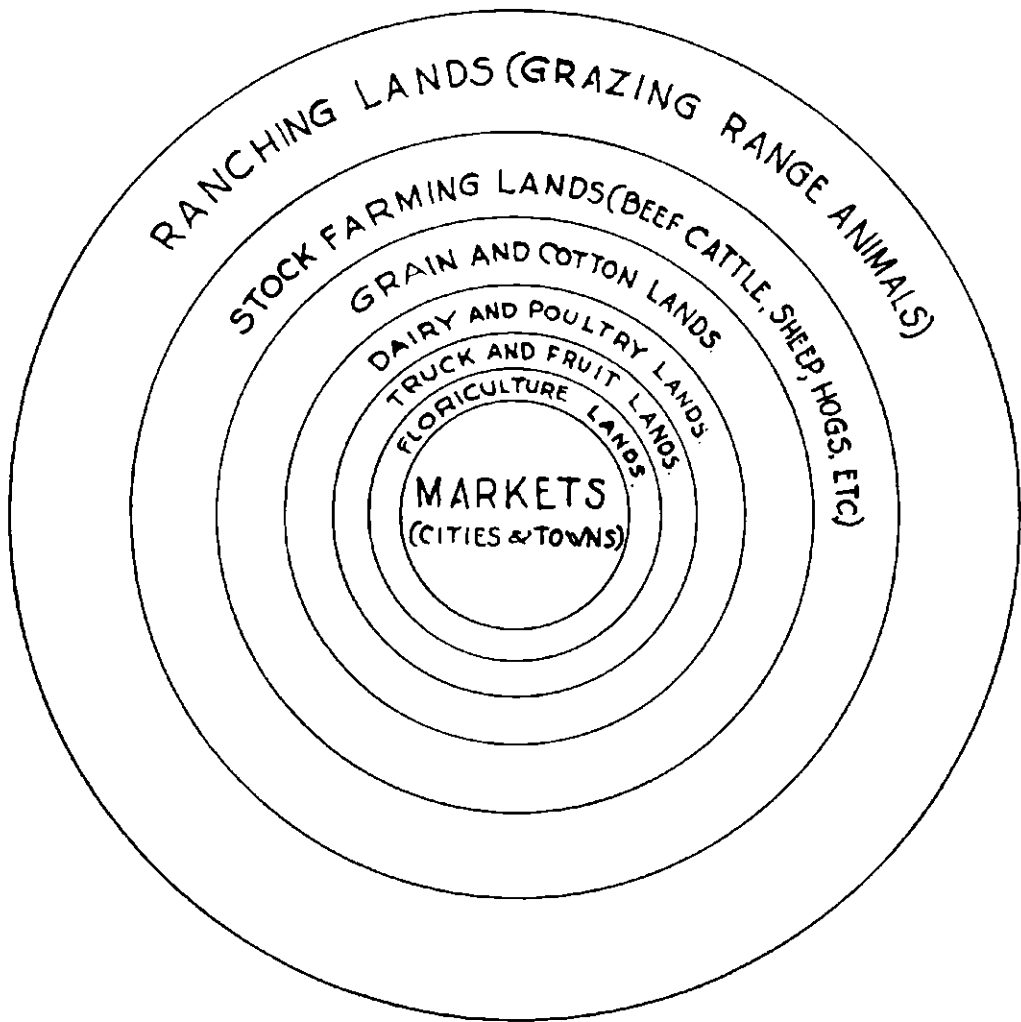
Theoretically speaking, the best ranch, therefore, would be the one possessing the highest productivity and most accessible to market. The most productive ranch, however, is not necessarily the closest to market. It likely as not happens that the ranch of greatest productivity is farthest from market, or it may be at any intermediate point. In the last analysis, the grade

---

<sup>42</sup> J. H. Von Thunen, "Der Isolierte Staat," Jena, Verlag von Gustav Fischer, 1921.

of land of any given ranch is determined by the *net product*. Obviously, the greater the distance from market the greater the expense of marketing and the smaller the net product, and therefore, the grade of ranch land varies inversely with the distance from market.

## EFFECT OF DISTANCE FROM MARKETS ON THE GRADES OF LAND



*In order to eliminate the effect of 'productivity' on the grades of ranch lands, in this illustration, it is presumed that the land is of uniform productivity.*

Figure 17.

## TAXATION OF RANCH LANDS

The principles governing the levying of taxes on range lands are, in the main, the same as for farming land. The production of range forage is, in the main, annual. Most of the forage produced in any one year is consumed in that year. Estimates of value are easily made. Taxes can be levied on the basis of capital value.

The problems of paying annual taxes in a range country, however, are somewhat more complicated. The annual crops of forage produced by land are sold through the production of range livestock. It takes two or more years to bring a range animal to market condition. Thus the animal production which is the result of the forage growth of one year, may not be sold in that year. Moreover, most of the range country is visited at irregular intervals with more or less severe drouths. The range refuses to produce the accustomed forage. Range animals of the proper age for market are unmarketable because of a lack of flesh. Under extreme conditions the ranchmen not only do not have anything to sell, but they are often forced to incur great expenses for feed and other supplies to prevent their livestock from starving. During such drouthy years, the payment of taxes becomes extremely difficult and often detrimental to the best interest of the Government. The payment of taxes may take the very funds which should go to buy feed and keep stock from perishing.

According to the best authorities there are certain well-defined principles of taxation which must be observed if the proper amount of revenue is raised and raised with the least burden to the taxpayers. Adam Smith<sup>43</sup> stated these principles as follows: "(1) The subjects of every state ought to contribute towards the support of the government, as nearly as possible, in proportion to their respective abilities . . . (2) The tax which each individual is bound to pay ought to be certain, and not arbitrary. The time of payment, the manner of payment, the quantity to be paid, ought all to be clear and plain to the contributor, and to other persons . . . (3) Every tax ought to be levied at the time or in the manner which is most likely to be conven-

<sup>43</sup> Adam Smith, "Wealth of Nations," Book V, Chapter 2.

ient for the contributor to pay it . . . (4) Every tax ought to be so contrived as both to take out and to keep out of the pockets of the people as little as possible, over and above what it brings into the public treasury of the state." According to these principles, the general property tax does not meet all the requirements of a good system of taxation for the ranch country unless considerable latitude is provided as to the time of payment. It is believed that if a general property tax is to be used extensively in the ranch country, an extension of from six to nine months should be granted for payment during bad years.

## LAND MEASUREMENT

Land may be measured in terms of acres or in terms of its productive capacity and efficiency. When one speaks of the size of a given area of land he usually expresses himself in terms of acres or sections and fractions of sections. Where land is all of similar quality and devoted to the same general purpose, such a method of measurement is most convenient and accurate for comparative purposes.

When lands of widely different qualities and which are used in different ways are compared, however, the measurement in terms of acres and sections may be grossly misleading. Such a comparison may lead the man in Central Texas on 160 acres of the best black land to think of his cousin in West Texas on 3,840 acres as a land baron. The former, however, may represent more wealth, require greater managerial skill to operate and yield a greater return than the latter.

A more satisfactory basis of measurement in this case would be one founded on the most appropriate organization of the factors of production—land, labor, capital and managerial ability—in both farming and ranching areas. Some such measure as the requirements for the family-sized unit furnishes a sound basis for comparing sizes of units. Such a unit is based on the capacity and efficiency of land in relation to labor, capital and managerial ability. <sup>44</sup>

---

<sup>44</sup> The factors and methods of determining this unit are discussed in Chapter VI.

## THE AREA STUDIED

The area studied includes 1,437 out of the 1,521 sections of 640 acres each in Sutton County,<sup>45</sup> and in addition 67 sections of land extending over into adjoining counties. The total area of the ranches included amounts to 1,503.6 sections, or 962,280 acres, more or less. When Sutton County, therefore, is referred to in the text, the total area of the 97 ranches included in this study is meant. As indicated, however, the areas are to all intents and purposes one and the same.

The first grouping made of the lands of Sutton County is on the basis of the size of ranch holdings. These groups are used for purposes of analysis throughout the entire study and should be carefully scrutinized.<sup>46</sup>

Table 12 shows an analysis of the ranches studied grouped according to size, number and percentage of sections in each group. The size of the holdings emphasizes the fact that ranch lands differ in some vital respects from farm lands.

TABLE 12

Showing number of ranches studied, grouped according to size, and per cent. of ranches, number of sections and per cent. of sections found in each group.

Groups of ranches by sizes	Number of ranches studied	Per cent. of ranches in each group	Number of sections	Per cent. of sections in each group
Total .....	97	100.00	1504	100.00
Under 1 section .....	1	1.03	1	.07
1 and under 2 sections .....	10	10.31	10	.67
2 and under 4 sections .....	5	5.15	11	.73
4 and under 8 sections .....	25	25.77	145	9.64
8 and under 12 sections .....	19	19.59	182	12.10
12 and under 20 sections .....	18	18.56	256	17.02
20 and under 32 sections .....	9	9.28	227	15.09
32 sections and above .....	10	10.31	672	44.68

<sup>45</sup> United States Census Reports, 1920. Some sections exceed the customary 640 acres by from 20 to 50 acres, or more.

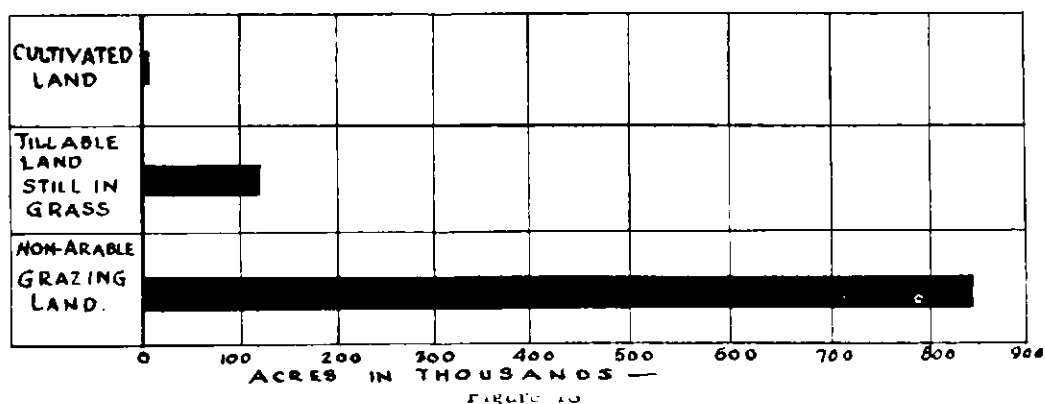
<sup>46</sup> The reasons for the selection of these groups are discussed in Chapter VI.



A CLASSIFICATION OF SUTTON COUNTY RANCH LANDS

The lands of Sutton County have all the characteristics of permanent grazing land.<sup>47</sup> Much of the land is too rough or too stony to ever be devoted to farming. The existing soil is fertile, but it is often too thin for successful farming.

THE CULTIVATED, ARABLE, AND NON-ARABLE LANDS OF THE 97 RANCHES STUDIED



Sutton County is located in the semi-arid region. It is classified as semi-arid because of its average rainfall, about 22 inches, and because of its high percentage of evaporation.<sup>48</sup> The rough topography of much of the land, the rockiness and thinness of the soil, combined with a semi-arid climate, make farming for its own sake hardly an economic possibility.

Table 13 indicates our classification of the lands found on the ranches studied.

TABLE 13  
Showing the Classes of Land on the Ranches Studied

Class	Sections	Acres	Per cent.
Total	1503.6	962,280.0	100.00
Arable			
Cultivated lands	7.3	4,689.5	.49
Tillable lands still in grass	197.0	114,534.0	11.90
Non-arable grazing lands	1317.3	843,056.0	87.61

47 See pages 91-106.

48 For detailed analysis of climate, see pages 55-63.

*Amount and Function of Each Class of Land*

*All Lands:* Table 14 shows the permanent ranch lands of Sutton County, classified according to kind of land, and analyzed according to sections, acres, and percentages. The total arable land in the county is not more than enough to furnish the desired amount of feed reserve for successful ranching. In order to engage successfully in stock-farming in a semi-arid region, at least 25 per cent. of the land should be utilized for crop production.

*Cultivated Lands:* Cultivated land is used primarily for two purposes. The one is for growing feed for saddle horses and teams when they are in use. The other is for the growing of an emergency feed supply for range animals. The reserve feed supply may be held to meet a general shortage in grazing due to protracted drouth wherein all animals must be fed to keep them alive. Or it may be held as a sort of emergency feed supply for sick animals or others which, for one reason or another, are unable to support themselves on the range. The aim of the ranchmen is to dispense with feeding as nearly as possible by putting no more stock on the land than it will normally carry.

The extent to which the ranchman will be successful in growing range animals entirely without feed will not only depend upon the number of animals he attempts to carry, but also upon the classes of animals run, the extreme variations in the forage production on the range, and the possibility of accumulating a natural feed reserve, such as sotol, sachahuista, or pastures of cured grass on the range. In the years 1917-1918 the range in Sutton County produced no forage. In 1920 the range furnished the usual amount of forage. To stock the range completely on the basis of 1920 production would obviously be inviting disaster. To stock it on the basis of production in 1918 would be a useless waste of forage. To utilize as completely as possible the forage grown on the range and at the same time avoid dangerous over-stocking in lean years, is a big problem for the ranchman. Only a few ranchmen are availing themselves of their opportunities for using their tillable land to accumulate a feed reserve to be used during dry years.

TABLE 14

Showing classification of all lands included in the study into cultivated land, tillable land still in grass, non-arable grazing land; the average number of each per ranch; the distribution of lands by percentages.

Groups of Ranches By Sizes	Entire Area Studied		Distribution of Land by Acres						Distribution of Land by Percentages		
	Number of Ranches	Acres	Cultivated Land		Tillable Land Still in Grass		Non-Arable Grazing Land		Cultivated Land Per cent.	Tillable Land Still in Grass Per Cent.	Non-arable Grazing Land Per cent.
			Acres	Average No. Acres per Ranch	Acres	Average No. Acres per Ranch	Acres	Average No. Acres per Ranch			
Total	97	962,280	4,690	48	114,534	1,181	843,056	8,691	.49	11.90	87.61
Under 1 section	1	420	120	120	150	150	150	150	28.58	35.71	35.71
1 and under 2 sections	10	6,509	379	38	1,485	149	4,645	465	5.82	22.81	71.36
2 and under 4 sections	5	7,360	290	58	870	174	6,200	1,240	3.94	11.82	84.24
4 and under 8 sections	25	92,497	437	17	5,905	236	86,155	3,446	.47	6.38	93.10
8 and under 12 sections	19	116,320	797	42	11,190	589	104,333	5,491	.69	9.62	89.69
12 and under 20 sections	18	163,974	495	28	21,364	1,187	142,115	7,895	.30	13.03	86.67
20 and under 32 sections	9	145,280	900	100	28,365	3,152	116,015	12,891	.62	19.52	79.86
32 sections and above	10	429,920	1,272	127	45,205	4,521	383,443	38,344	.30	10.51	89.19

Table 14 shows that outside of the one-section ranches there is seemingly no correlation between the size of ranches and the amount of tillable land on ranches. The fact is that outside of the one-section ranches, the group of ranches containing 20 and under 32 sections has the greatest percentage of tillable land. Such a distribution shows that, up to the present time, the percentage of tillable land has not been an important factor in determining the size of ranches.

Table 15 is an analysis of the 4690 acres of cultivated lands, equalling 3.9 per cent. of the total area of arable lands amounting to 119,223.5 acres. The cultivated lands are about one-half of one per cent. of the total land area of the county. Even this small amount of land in fields is cultivated more or less intermittently, due in part to the scarcity of farmers and farm hands, and in part to the uncertainty of crops which is attributable to the irregularity in the time and amount of rainfall. With drouth-resistant crops and suitable methods of moisture conservation, however, very satisfactory yields may be obtained three or four years out of five.



Figure 19. Harvesting Sudan grass hay, Ranch Experiment Station. An example of cultivated land in the area studied. (Photo. courtesy The Progressive Farmer, Dallas).

COMPARATIVE AMOUNTS AND DISTRIBUTION BY GROUPS OF CULTIVATED LAND WITH TOTAL LAND AREA OF THE 97 RANCHES STUDIED.

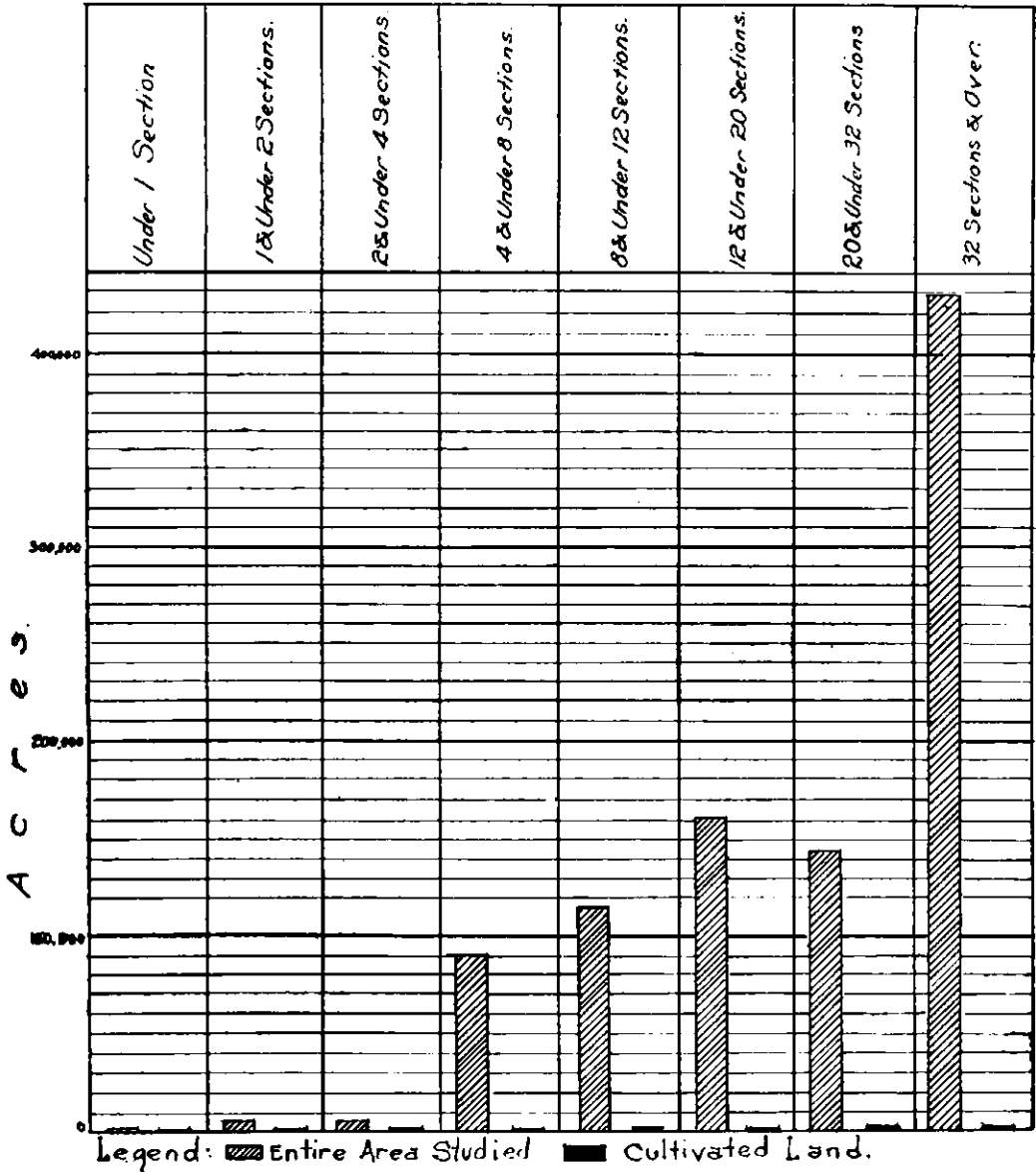


Figure 20

*Tillable Lands Still in Grass:* The advisability of converting tillable land into plowed land depends upon the relative productiveness of the land in grass and in crops, and the intensity of use of land required to balance the other factors of production.

TABLE 15  
 Showing the cultivated lands; the average number of acres of cultivated land per ranch and per section; the ratio of cultivated to all lands and land within each group; and the percentage distribution of cultivated lands.

Groups of Ranches By Sizes	Entire Area Studied				Cultivated Land				
	Number of Ranches	Acres	Sections	Acres	Average Number of Ranches per Section	Average Number of Acres per Ranch	Average Number of Acres per Section	Ratio of Cul- tivated to all Lands and Land Within Each Group	Percentage Distribution of Cultivated Lands
Total	97	962,280	1,504	4,690	48	3	.49	100.00	
Under 1 section	1	420	1	120	120	120	28.57	2.56	
1 and under 2 sections	10	6,509	10	379	38	38	5.82	8.08	
2 and under 4 sections	5	7,360	11	290	58	26	3.94	6.18	
4 and under 8 sections	25	92,497	145	437	17	3	.47	9.32	
8 and under 12 sections	19	116,320	182	797	42	4	.69	16.99	
12 and under 20 sections	18	163,974	256	495	28	2	.30	10.56	
20 and under 32 sections	9	145,280	227	900	100	4	.62	19.19	
32 sections and above	10	429,920	672	1,272	127	2	.30	27.12	

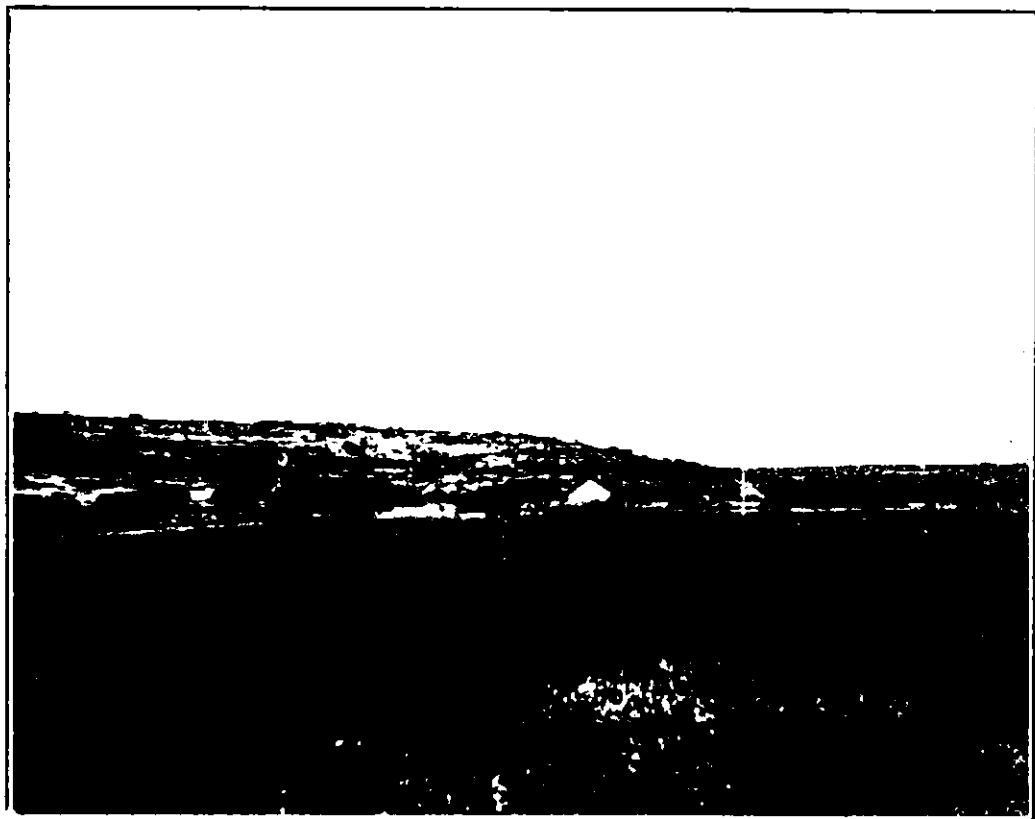


Figure 21. Tillable land still in grass. (Photo, courtesy The Progressive Farmer, Dallas).

As the quality and value of range livestock increase, the value of the land tends to increase, which demands a more intensive use of it to keep a proper balance among land, labor and capital. This tends to bring all lands under cultivation which promise to yield greater returns under cultivation than in grass. As a rule, however, the tillable lands of a ranch should not be put into cultivation any faster than they are demanded for purposes of providing the emergency feed supply.

Table 16 is an analysis of the tillable lands still in grass. They comprise 11.9 per cent. of the total lands of the county. By this is meant that the soil is sufficiently level, deep and fertile to be cultivated and that it is in bodies containing ten or more acres. These lands are classed as "Tillable lands still in grass" because they are still devoted to grazing.

TABLE 16

Showing the tillable lands still in grass; the average number of acres of tillable land still in grass per ranch and per section; the ratio of tillable lands still in grass, to all lands and land within each group; and the percentage distribution of tillable lands still in grass.

Groups of Ranches By Sizes	Entire Area Studied				Tillable Land Still in Grass.					Percentage Distribution of Tillable Land Still in Grass
	Number of Ranches	Acres	Sections	Acres	Average Number Acres per Ranch	Average per Section	Ratio Tillable Land Still in Grass to all Lands and Land Within Each Group	Percentage Distribution of Tillable Land Still in Grass		
Total	97	962,280	1,504	114,534	1,181	76	11.90	100.00		
Under 1 section	1	420	1	150	150	150	35.71	.13		
1 and under 2 sections	10	6,509	10	1,485	149	149	22.81	1.30		
2 and under 4 sections	5	7,360	11	870	174	79	11.82	.76		
4 and under 8 sections	25	92,497	145	5,905	236	41	6.38	5.16		
8 and under 12 sections	19	116,320	182	11,190	589	61	9.62	9.77		
12 and under 20 sections	18	163,974	256	21,364	1,187	83	13.03	18.65		
20 and under 32 sections	9	145,280	227	28,365	3,152	125	19.52	24.76		
32 sections and above	10	429,920	672	45,205	4,521	67	10.51	39.47		



COMPARATIVE AMOUNTS AND DISTRIBUTION BY GROUPS OF TILLABLE LAND STILL IN GRASS, WITH TOTAL AREA OF THE 97 RANCHES STUDIED

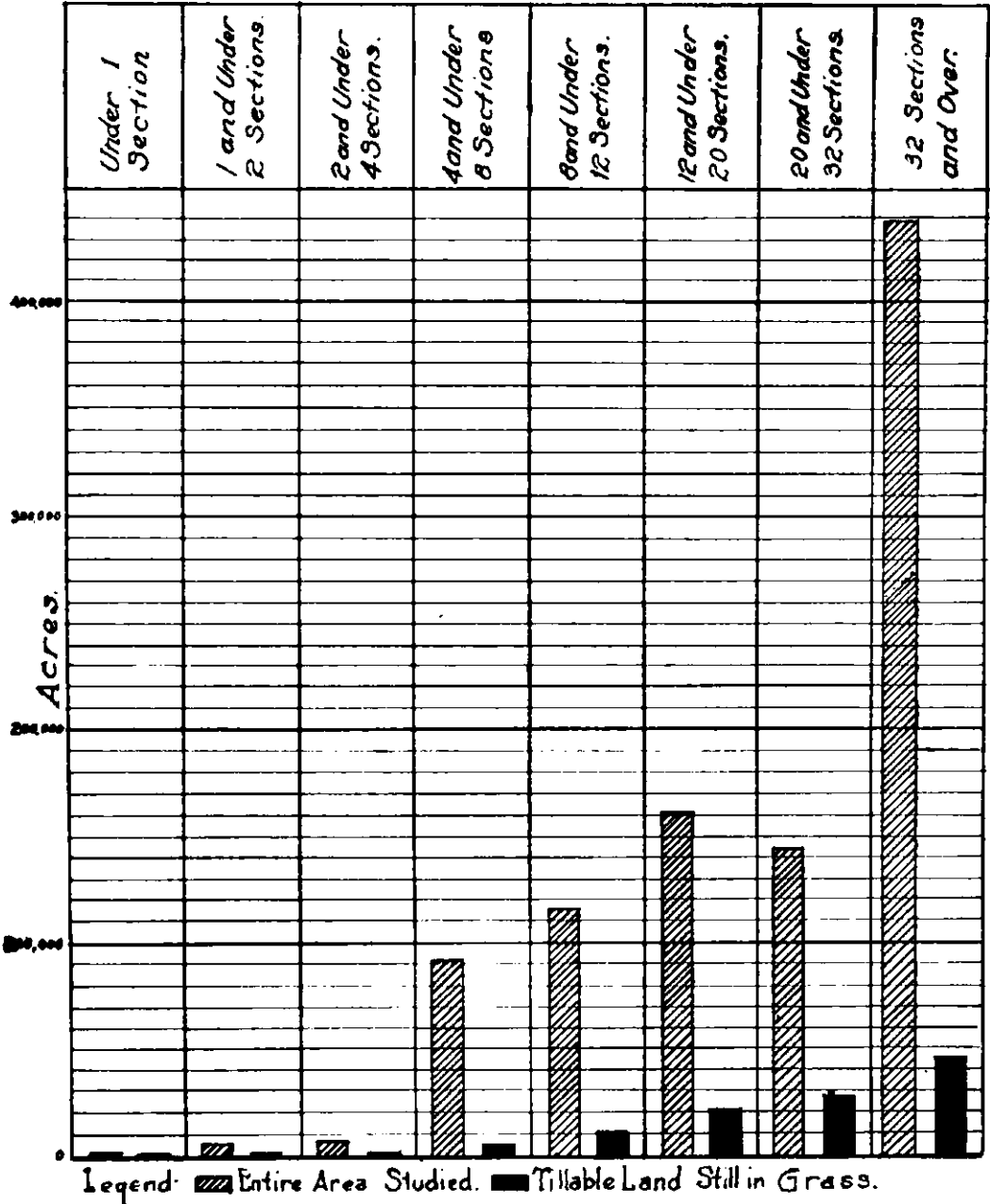


Figure 22

*Arable Land:* The limited supply of arable land indicates that this can never become a stock-farming country, properly speaking. In fact, the best that can be hoped for is that the ranchmen will find a practicable means of raising and storing a

feed reserve that will enable them to better utilize their ranges during good years. Under present conditions, the very abundance in good years may prove a serious menace, especially on sheep ranges. If the grass gets too tall, sheep will not graze it and needle grass often grows so rank that it becomes exceedingly injurious to sheep. The proper balancing of pasture with field for reserve feed supply will help eliminate such problems.

Table 17 is an analysis of the arable lands. In this table the "Cultivated lands" are added to the "Tillable lands still in grass" and these constitute the "Arable lands." As indicated, they amount to 119,224 acres, or about 12.39 per cent. of the entire area studied.

*Permanent, or Non-Arable, Grazing Lands:* The fact that lands are classed as non-arable lands in a ranching region is not an indication of a lack of desirability for ranching purposes. In fact, the non-arable land is often the most valuable for grazing. The broken, rocky country usually produces a greater variety of forage plants. It stands a drouth better, and it offers much better protection from weather extremes than level land.

According to the figures in Table 14, it will be observed that the area studied is, according to our definition, rather typical ranching territory. It has 87.61 per cent. of its land classed as non-arable grazing lands, and only 12.39 per cent. classed as arable lands. The ratio of arable to non-arable lands is sufficient to provide ample feed reserves when they have all been put into cultivation and suitable crops adapted to the conditions, suitable tillage methods used, and satisfactory ways of preserving them devised. The 87.61 per cent. of the land classed as non-arable is so stony, rocky, or broken, that there is no temptation to put it into cultivation even in the most seasonable years.

TABLE 17

Showing the arable lands, which include both "cultivated lands" and "tillable lands still in grass," the average number of acres of arable land per ranch and per section; the ratio of arable to all lands and land within each group; and the percentage distribution of arable lands.

Groups of Ranches By Sizes	Entire Area Studied			Arable Lands					Percentage Distribution of Arable Lands
	Number of Ranches	Acres	Sections	Acres	Average Number Acres per Ranch	Average Number Acres per Section	Ratio of Arable to all Land Within Each Group		
Total .....	97	962,280	1,504	119,224	1,229	79	12.39	100.00	
Under 1 section .....	1	420	1	270	270	270	64.29	.23	
1 and under 2 sections .....	10	6,509	10	1,864	186	186	28.64	1.56	
2 and under 4 sections .....	5	7,360	11	1,160	232	105	15.76	.97	
4 and under 8 sections .....	25	92,497	145	6,342	254	44	6.86	5.32	
8 and under 12 sections .....	19	116,320	182	11,987	631	66	10.31	10.05	
12 and under 20 sections .....	18	163,974	256	21,859	1,214	85	13.33	18.34	
20 and under 32 sections .....	9	145,280	227	29,265	3,252	129	20.14	24.55	
32 sections and above .....	10	429,920	672	46,477	4,648	69	10.81	38.98	

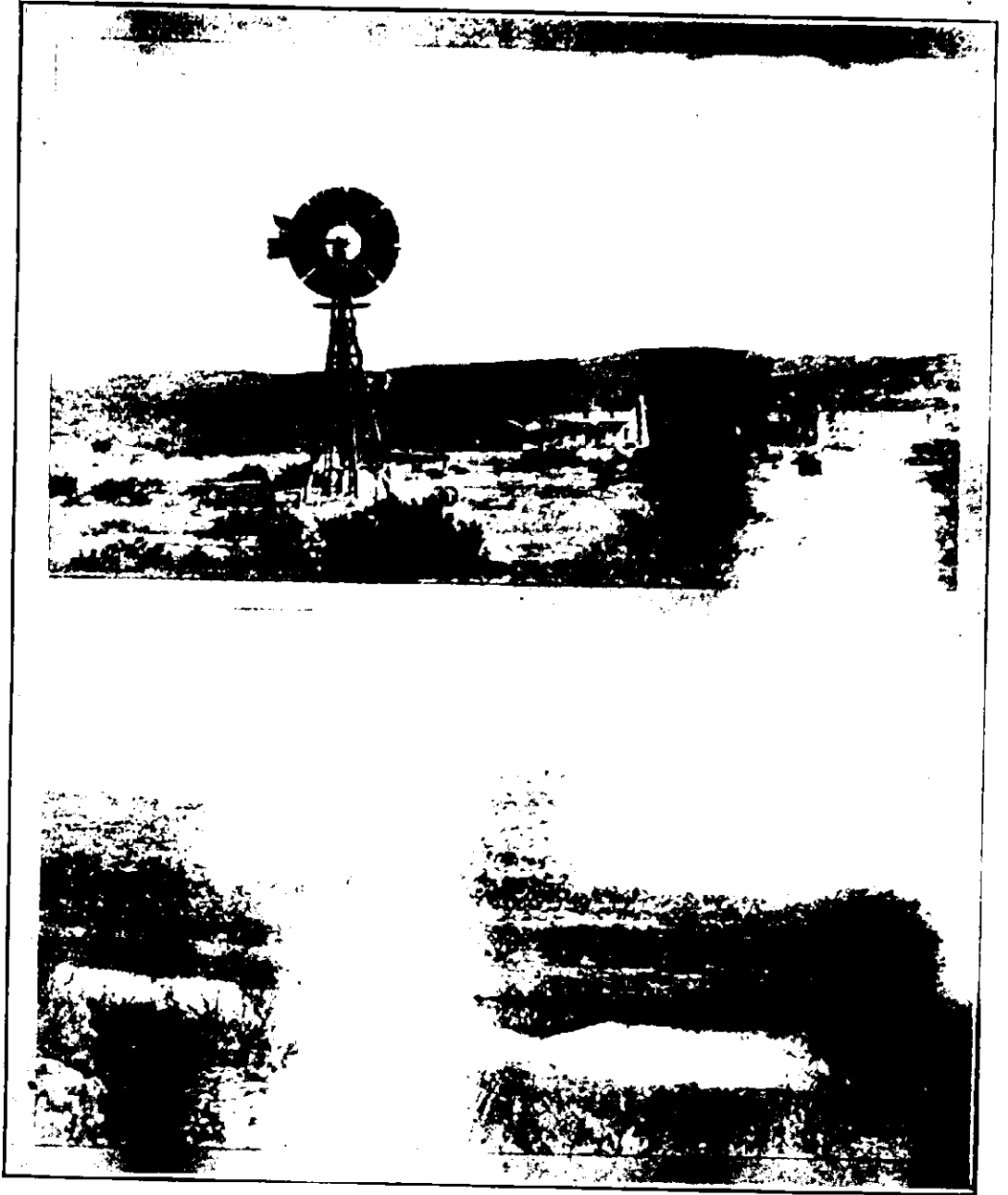


Figure 23. Because of topography, shallow soil and lack of water, this land will remain untilled throughout this geological age.

TABLE 18

Showing the non-arable grazing lands; the average number of acres of non-arable grazing land per ranch and per section; the ratio of non-arable grazing lands to all lands and land within each group; and the percentage distribution of non-arable grazing lands.

Groups of Ranches By Sizes	Entire Area Studied			Non-Arable Grazing Lands					Percentage Distribution of Non- Arable Graz- ing Lands
	Number of Ranches	Acres	Sections	Acres	Average Number per Ranch	Average Number per Section	Ratio Non- Arable Graz- ing Land to all Lands and Land Within Each Group		
Total	97	962,280	1,504	843,056	8,691	561	87.61	100.00	
Under 1 section	1	420	1	150	150	150	35.71	.02	
1 and under 2 sections	10	6,509	10	4,645	465	465	71.36	.55	
2 and under 4 sections	5	7,360	11	6,200	1,240	564	84.24	.73	
4 and under 8 sections	25	92,497	145	86,155	3,446	594	93.10	10.22	
8 and under 12 sections	19	116,320	182	104,333	5,491	573	89.69	12.38	
12 and under 20 sections	18	163,974	256	142,115	7,895	555	86.67	16.86	
20 and under 32 sections	9	145,280	227	116,015	12,891	511	79.86	13.76	
32 sections and above	10	429,920	672	383,443	38,344	571	89.19	45.48	

TABLE 19

Showing the grazing lands which include both "tillable lands still in grass" and "non-arable grazing lands"; the average number of acres of grazing land per ranch and per section; the ratio of grazing lands to all lands and land within each group; and the percentage distribution of grazing lands.

Groups of Ranches By Sizes	Entire Area Studied			Grazing Lands						
	Number of Ranches	Acres	Sections	Number of Pastures	Acres	Average Number Acres Per Pasture	Average Number Acres Per Ranch	Average Number Acres per Section	Ratio of Grazing Lands to all Lands Within Each Group	Percentage Distribution of Grazing Lands
Total .....	97	962,280	1,504	491	957,590	1,950	9,872	637	99.51	100.00
Under 1 section .....	1	420	1	1	300	300	300	300	71.43	.03
1 and under 2 sections .....	10	6,509	10	13	6,130	472	613	613	94.18	.64
2 and under 4 sections .....	5	7,360	11	15	7,070	471	1,414	643	96.06	.74
4 and under 8 sections .....	25	92,497	145	80	92,060	1,151	3,682	635	99.53	9.61
8 and under 12 sections .....	19	116,320	182	90	115,523	1,284	6,080	635	99.31	12.06
12 and under 20 sections .....	18	163,974	256	85	163,479	1,923	9,082	639	99.70	17.07
20 and under 32 sections .....	9	145,280	227	61	144,380	2,367	16,042	636	99.38	15.08
32 sections and above .....	10	429,920	672	146	428,648	2,936	42,865	638	99.70	44.76

*Total Grazing Lands:* The limited use of arable lands for crop production indicates that the ranchmen consider these lands more profitable as grazing lands, and that the feed reserve idea is not yet well established in this region.

Table 19 shows the "Tillable lands still in grass" which are added to the "Non-arable grazing lands" and the total is designated as the "Total grazing land." It shows the average number of acres of "Total grazing land" per ranch, per pasture, and per section; the ratios of these lands to all lands and land within each group; and their percentage distribution.

## CONCLUSIONS

The characteristics of the land in Sutton County are such that ranching will continue to be the most economical use to which it may be put. The climatic data and figures on crop production, however, show that as range lands increase in value, and more intensive ranching is followed, it will be profitable to put the best of the tillable lands into crops for feed reserves. In the good years not all the pasture lands are needed for the grazing of the normal amount of stock. Hence, the use of tillable areas for crops in the good years does not lessen materially the normal carrying capacity. The chief difficulties most ranchmen encounter in providing the desired feed reserve are those of getting and keeping competent farm hands and carrying the feed produced in the good years over to the bad years. Ranching and farming compete for one's energies. It is difficult, therefore, to find combined in one person the qualities of a good ranchman and a good farmer.

## CHAPTER VI

# THE SIZE OF RANCHES

### THE RANCH UNIT

When a country is new and there are no restrictions on the movements of population, graziers tend either to go so far from the markets that the lands which they occupy have little or no exchange value or else they occupy lands so unproductive that they are not demanded for farming purposes. Under these conditions, the problems of the size of ranches do not appear. A ranchman's wealth in this stage of development is measured in terms of the number and size of flocks and herds, and not in the number of acres grazed.

Even as long as men can lease large bodies of land for nominal rent, the size of ranches has no great significance when measured in terms of area. The discussion in the Census of 1880 on ranching <sup>49</sup> measures the size of ranches almost invariably by the number of animals of the various types run.

When ranching has progressed to the point that drift fences have served their usefulness, definite areas are enclosed by a more permanent type of fence. Thereafter the size of ranches comes to be expressed in terms of sections of land rather than in numbers of animals. Such a measure of size is ample if one is concerned primarily with area. On the other hand, if one wishes to speak of the size of ranches in terms of the production of economic goods, then he must think in terms of units of area multiplied by the carrying capacity of that area.

According to the Census definition, any tract of land used for agricultural purposes, of three acres or over or even a smaller tract which produces as much as \$250.00 worth of products a year, is a farm. This definition of farms carries with it nothing suggestive of the leading characteristics of a ranch.

<sup>49</sup> Reports of the Productions of Agriculture of the 10th Census, June 1880, Government Printing Office, Washington, D. C., pages 599-1110.



Moreover, the classification into groups based on area made by the Census for analyzing farms, is of little or no service for classifying and analyzing ranches, for all units containing 1,000 acres or more are placed in one group. A ranch with less than 1,000 acres is scarcely to be considered a ranch at all. The Census classification of farms ends, therefore, before the size which may properly be called a ranch begins.

Table 20 shows the size of farms in Sutton County according to the Census classification.

TABLE 20  
The Size of Farms in Sutton County <sup>50</sup>

Size Group	1900 Census	1910 Census
Total .....	93	131
Under 3 acres .....	0	0
3 and under 10 acres .....	0	0
10 and under 20 acres .....	0	1
20 and under 50 acres .....	1	2
50 and under 100 acres .....	0	7
100 and under 175 acres .....	0	1
175 and under 260 acres .....	0	1
260 and under 500 acres .....	0	4
500 and under 1000 acres .....	9	13
Over 1000 acres .....	83	102

In order to isolate the particular unit under consideration in this study, a ranch has been defined to mean that unit of land and equipment which is devoted to the production of livestock primarily by grazing and which occupies the major portion of the time of one or more men.

<sup>50</sup> United States Census Reports.

The parcels of land in a ranching area under 640 acres and classed by the Census as farms are thus classed solely on the basis of area. They neither afford an appreciable income nor occupy any significant amount of the time, energy or thought of the owner. Most such parcels are odd bits of land lying near town and held for some special purpose and should be classed neither as farms nor ranches. Accordingly they are not considered in this survey.

The Census is further inconsistent in that it classes all units of ranch land under one management as one ranch, while it classes the units of land on larger farms or plantations as separate farms, notwithstanding the fact that the tenants are often nothing more nor less than farm hands under centralized management and their wages paid wholly or in part out of a share of the crops grown. Should a ranchman buy a few sections from his neighbor and incorporate them into his ranch unit by increasing the size of existing pastures or by creating new pastures, it would be understood that he had merely enlarged his ranch. Should the same ranchman buy all his neighbor's land and operate it as a separate unit he would say: "I own two ranches." The practical test as to the number of ranches in a given area is, therefore, not the number of parcels of land above a given size under separate management, but the number of independently operated units.

A large part of the value of the modern ranch consists of the permanent improvements put on it in the way of wells, reservoirs, fences, dipping vats, sheds, and corrals. On a scientifically laid out ranch, these different improvements are so grouped with reference to the area in question that the organization may not be destroyed without very great expense and loss. The result is once a highly improved ranch, always a ranch, unless taken for a much more intensive type of use.

In order to get a classification that will show more fully the distribution of ranches according to size, the following sized groups have been selected. This table also gives a classification and analysis of the number of ranches concerned in this study. If the Census would adopt some such classification for units of land above 640 acres in the ranching

country, it would prove very helpful to those engaged in making ranch economic studies.

TABLE 21

Showing the number of ranches studied, grouped according to size and per cent. of ranches, number of sections and per cent. of sections found in each group.

Size of Groups of Ranches	Number of Ranches	Per cent. of Ranches in Each Group	Number of Sections	Per cent. of Sections in Each Group
Total .....	97	100.0	1,504	100.00
Under 1 section .....	1	1.0	1	.07
1 and under 2 sections..	10	10.0	10	.67
2 and under 4 sections..	5	5.0	12	.80
4 and under 8 sections..	25	26.0	146	9.70
8 and under 12 sections.	19	20.0	180	11.97
12 and under 20 sections	18	19.0	256	17.02
20 and under 32 sections	9	9.0	227	15.09
32 sections and above..	10	10.0	672	44.68

The first group in this table is designed to include all those odd parcels of land which may not be classed as ranches as the term *ranch* is used in this discussion. The second division, or the one-section group, is used to isolate the one-section homesteads that were granted quite freely in many parts of West Texas. In some instances these homesteads lay along streams with some valley land, probably irrigable, or were situated on the divides where the land is level and good and the climate is seasonable enough to make the production of feed crops fairly profitable.

If the land is extra good for the locality, and the management good, it is possible for a small family to occupy its time on a one-section ranch and live. The amounts of tillable land still in grass and the further fact that these lands are not evenly dis-

tributed indicate that the number of one-section ranches and stock-farms in Sutton County may increase somewhat as the marketing facilities are improved and the price of land rises.

The group containing two and under four sections indicates the same general type of ranching as practiced by the one-section ranchman, but being larger these ranches are more efficient.

The four- to eight-section group includes the greater number of the family-sized ranches of this section. These ranches are used primarily for stock-raising rather than the grazing of steers and muttoms bought and sold. A four-section ranch is the smallest unit which can be watered efficiently from deep wells. A well dug in the center of a square block of four sections will be just as accessible to livestock as a similar well on a two-section ranch. The number of wells must be held to the minimum which will satisfactorily water the ranch, for the reason that it is very easy to over-capitalize on watering places. A single well, windmill and reservoir, for example, costs at least \$2,500.00. One well may be made to water a six-section ranch provided it is centrally located and supplemented with earthen reservoirs out in the pastures. An advantage of a central watering place is the fact that the ranchman can see his livestock daily as it comes in to water.

The eight- to twelve-section ranches are more often two-men ranches for stock-raising purposes, and will require at least two watering places. Ranches in this group may be run by one person where steers or other non-breeding animals compose the larger part of the animals grazed. If the operator is an exceptionally good manager, he may even operate an eight- to twelve-section ranch for stock-raising purposes.

The twelve- to twenty-section ranches are beyond the family size unless the owners have several boys capable of helping or else they graze steers and mutton sheep and goats.

The ranches containing twenty to thirty-two sections are definitely beyond the family-sized ranches and require several hired hands. In most cases the hired hands live at different places on the ranch. The stock is usually classified and each man takes care of a particular class on a definite area.

The ranches containing thirty-two sections and over are what may be called the "big ranches." They vary in size in Sutton County from thirty-four to one hundred and twenty-four sections. These ranches may be operated in divisions or run entirely from a single headquarters by means of herders and others who manage a definite amount of livestock rather than a definite area.

### SIZE OF RANCHES AS MEASURED BY INVESTMENTS

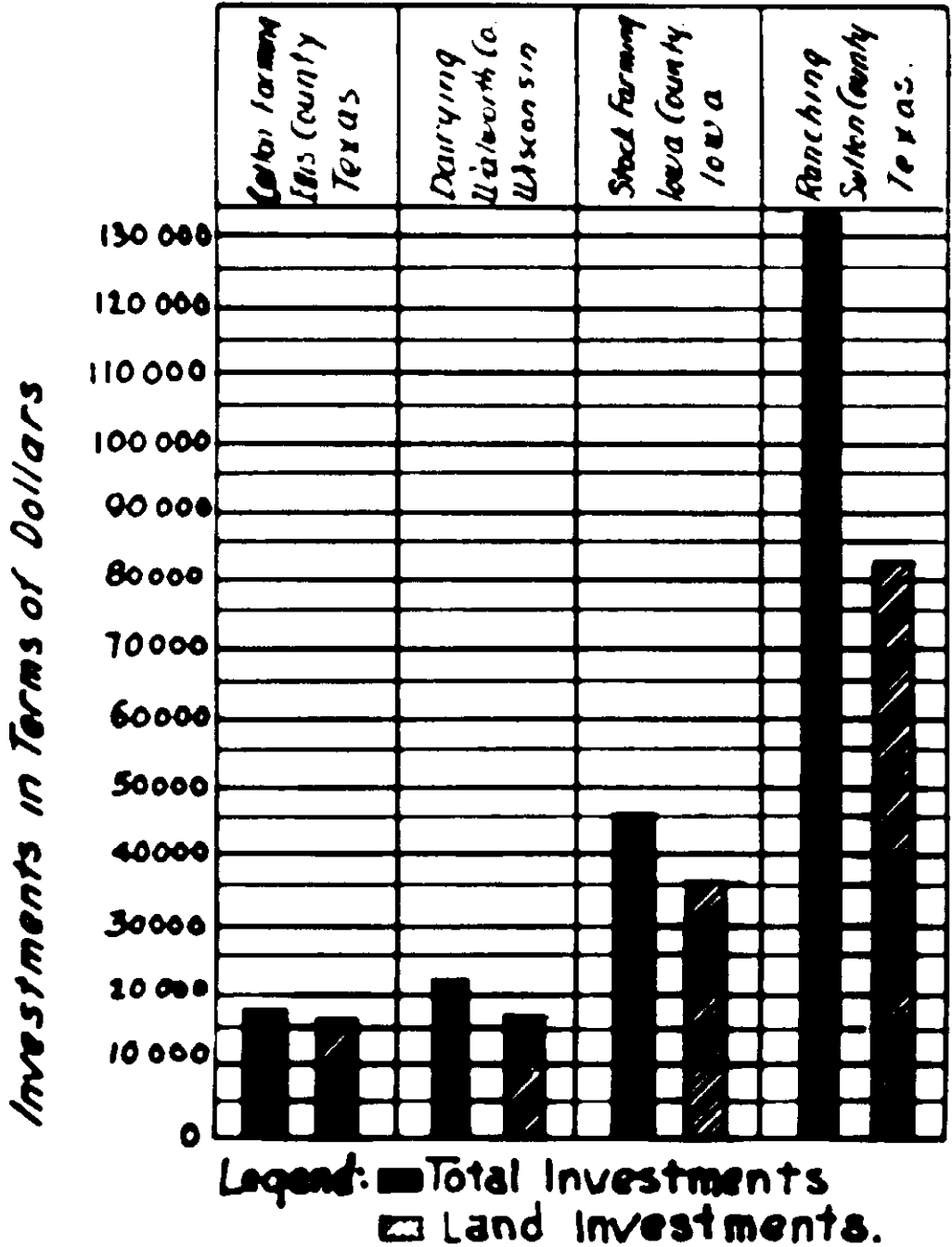
Ranches not only require much more land for economical operation than farms, but they likewise require a much larger money investment. The average price of land in the area studied is about \$15.00 per acre.<sup>51</sup> If the eight sections are taken as the family-sized ranch, the amount invested in real estate amounts to \$76,800.00. The amount invested in livestock based on the normal carrying capacity, as determined by the survey, equals about \$24,000.00. This would bring the investment up to approximately \$100,000.00.

In normal times, a highly improved ranch containing eight sections would sell for much more than this estimate. *The Dallas Morning News* of May 22, 1921, for example, contains a notice to the effect that a 3500-acre ranch close to Plainview, Texas, with its stock and equipment sold for \$250,000.00.

The fact is, ranching permits of a greater use of capital per man than any other type of agriculture. It is the one example where agriculture offers excellent opportunities for large-scale business. In most lines of agriculture the income of those concerned is measured very largely by the amount of capital they are able to use successfully. It is claimed, for example, that the Corn Belt farmer realizes a better income than the cotton farmer because he employs more capital in his farming operations. He is able to employ more horsepower and machinery to get by his peak load, the cultivation of his corn, whereas the cotton farmer must get by his peak load, the cotton picking, by the use of hand labor. The large amount of hand labor required makes cotton raising necessarily a small type business unless there is an abundance

<sup>51</sup> In 1920.

AVERAGE SIZE OF INVESTMENT FOR DIFFERENT LINES OF AGRICULTURAL PRODUCTION.



of cheap labor available. Measured by the same standards, the ranchman should be able to earn a greater income than one in any other line of agricultural production because he is able to use more capital in his business.

Dairy-farming comes nearer being a typically family business than any other type of agriculture. It gives steady employment and offers a fair income to the industrious family. Dairying, however, is a comparatively small type of business. The limits to the size of business are set by the ability of the family to milk cows and to do it very largely by hand. A successful milking machine would probably double the size of the dairy farm and the income of the farmer.

Figure 24 gives an analysis of the amounts of capital used on the family-sized cotton farm, dairy farm, Corn Belt farms, and ranch.<sup>52</sup>

The proper sized ranch may be defined as *that size which develops and utilizes most efficiently the economic and social powers of every member of the ranch family.* The actual number of sections in such a ranch is determined by the productivity of the ranch, its distance from the market, the ability of the man, the amount of capital available for use in operation, and the stage of development of the country. That size of ranch is best which gives the best present utilization of the factors used in ranch production and which makes possible the best future utilization of these factors. The methods of attaining the ideal set forth are the privileges and facilities guaranteed to individuals, under certain rules and regulations laid down by the State, to acquire, hold and use land in proportion to their abilities and to parcel that land out to their descendants.

## THE HISTORY OF THE SIZE OF RANCHES IN SUTTON COUNTY

The Census for 1900 was the first to give separate statistics for Sutton County relative to the size of "farms." Ac-

<sup>52</sup> These data were taken from the 1910 Census Reports. The figures for the cotton farm are for Ellis County, Texas, the dairy farm from Walworth County, Wisconsin, the corn and hog farms from Iowa County, Iowa, and the ranches from Sutton County, Texas.

According to the 1900 Census, there were 93 "farms" in the county, which comprised an area of 928,178 acres. There were only 10 "farms" below one thousand acres. In 1910 the total number below one thousand acres had increased to 29 and the total area included was 973,440 acres. In 1920 the Census Reports showed only 20 farms below one thousand acres.

The average sized ranch in Sutton County decreased from 1900 to 1910, if the average is taken to mean all ranches reported, divided by the total number of acres in the county. Such a method of securing the average-sized ranch is misleading, however, because those divisions below one section are in no sense ranches and many of the one-section places are not ranches. If the number of sections or acres in the group containing one thousand acres and over be divided by the number of ranches in that group, the quotient will more accurately indicate the real movement in the average size of ranches. According to this method of calculation, the average sized ranch was 11,073.9 acres in 1900,<sup>53</sup> and had decreased to 9,394 acres in 1910. In 1920 the average had increased to 9,979 acres. The recent survey and the records of the County Clerk indicate that the average sized ranch in 1920, of those above one thousand acres, was actually 10,203.7 acres.

The figures stated might be taken to indicate much instability in the size and number of ranches if one should overlook the fact that the changes noted are due to certain outside causes. The 1900 Census was made while most of the land in Sutton County was leased from the State. The 1910 Census followed shortly after a rapid transition from a state of leasehold to that of free-hold. Land was sold by the State in alternate sections which required many adjustments to obtain unified ranches. Many men unfamiliar with ranching bought insufficient amounts of land which either had to be sold out or added to. This explains in a large measure both the decrease in the size of ranches between 1900 and 1910 and the increase in size between 1910 and 1920.

---

<sup>53</sup> The number of sections in the last group is estimated by giving all farms in the preceding groups the maximum size on those groups. The number of acres in a county, according to the Census figures, varies, because the area is measured in terms of ranches, and ranches extend over county lines. A ranch is usually put in the county which contains the headquarters and most of the land of the ranch.



Figure 25 shows the size of farms in Sutton County, according to the Census for 1900, 1910 and 1920. Figure 26 shows the 97 ranches studied in Sutton County, distributed by a grouping designed to indicate more in detail the actual sizes of the ranches.

SIZE OF FARMS IN SUTTON COUNTY, TEXAS.  
(U. S. CENSUS.)

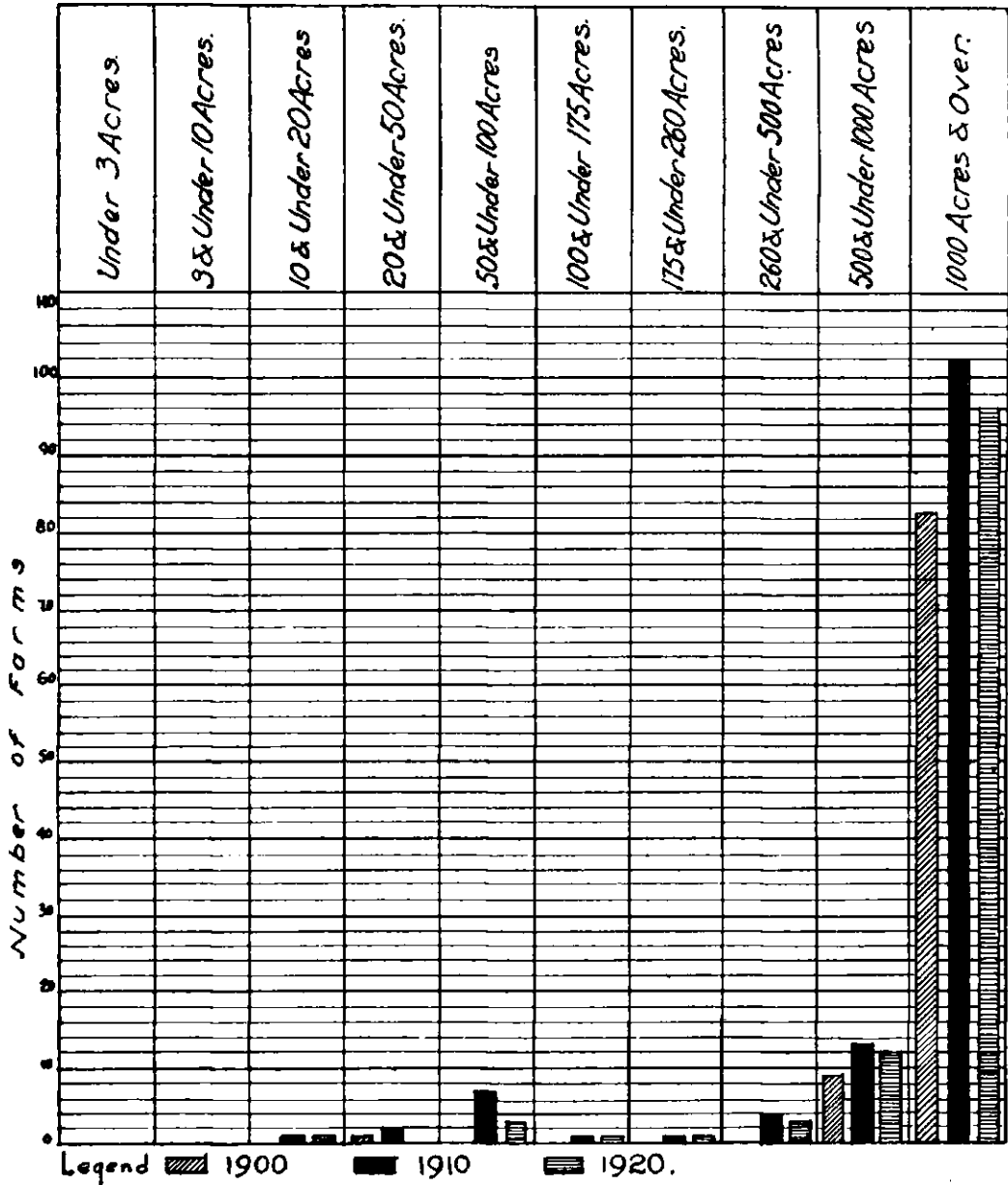


Figure 25

THE SIZES OF THE NINETY - SEVEN RANCHES STUDIED IN SUTTON COUNTY.

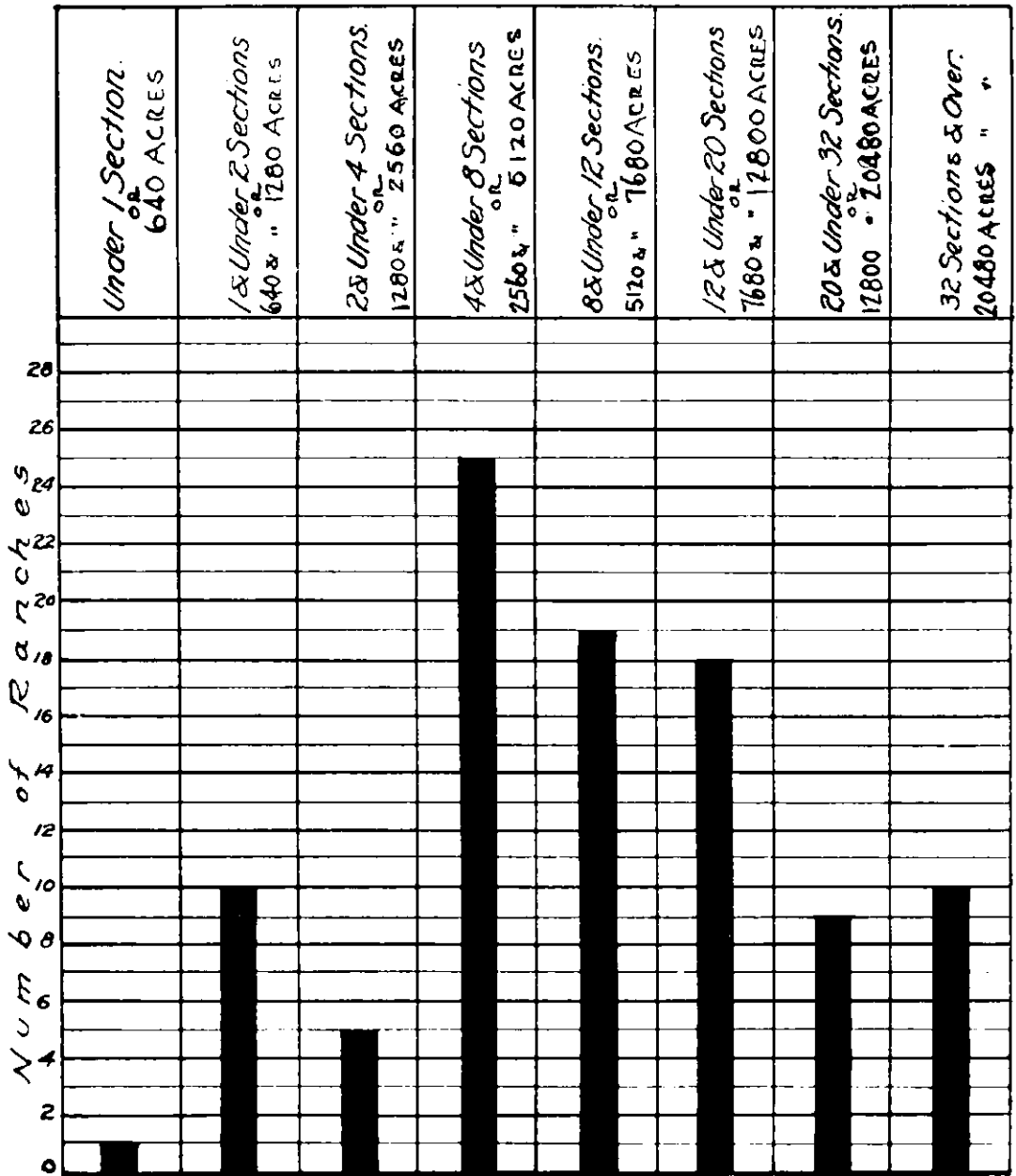


Figure 23

FACTORS INFLUENCING THE SIZE OF RANCHES

Physical Factors

The size of ranches is the result of the influence of a variety of factors. These may be classed roughly as physical,

economical, political, and individual. The factors themselves are combined in a great variety of relations.

The more important physical factors influencing the size of ranches are topography, soil, climate, distance from the market, and natural vegetation. Topography influences the size of ranches both from the standpoint of its influence on the effectiveness of management and the types of animals run. Level land is usually best adapted to cattle. Because of the comparatively small amount of attention required by them as compared with other range animals, cattle grazing offers the best opportunity for extensive operation. Angora goats require the greatest amount of care and are best adapted to the rough lands.

Therefore, the manager must not only run different breeds and species of animals on ranches with differences in topography, but he must supply the extra care demanded by different breeds of animals. The amount of labor required to give the necessary attention is greater in a rough country, for the manager cannot go from one part of his ranch to another as quickly in a rough country as in a level country. The ranchman cannot see as far in a rough country as in a level country. Hence, the ranchman riding his pastures in a rough country is compelled to cover the ground more thoroughly than the one in a level country. It may be said, therefore, that other things being equal, the size of ranches varies directly with the smoothness and inversely with the roughness of the topography.

The character of the soil is a fundamental factor in determining the size of ranches. This is not only an important factor in determining the kind of vegetation produced, but the quantity and quality of that vegetation. The less productive the soil, the more extensive must be the area for an economic holding. It may be said, therefore, that the size of ranches varies inversely with the productivity of the soil. Rough land is often poor land, and some of the largest ranches are found in a rough country, but they are there because poorness predominates over roughness, and if the land were level the operator could manage even more of it.

One of the most important factors determining the size of ranches is the climate. Climate is here taken to include such items as rainfall, evaporation, and temperature. A mild climate, free from sudden changes of weather, tends to promote large ranches because it eliminates possible losses due to unexpected changes in the weather. If the climate varies very widely as to heat and cold, it tends to make for smaller ranches. If the weather gets extremely cold, the ranchman must provide some means for caring for his livestock. At such times, if his holding is too extensive, he frequently has great losses due to his inability to get his stock under shelter. Moreover, during severe weather feed must be provided, which also tends to limit the size of ranches. It may be said, therefore, that the size of ranches varies directly with warmth and evenness and inversely with changeableness and coldness of the climate.

Climate may affect the size of ranches indirectly. Rainfall and evaporation influence very greatly the productivity of the soil. The size of the ranch will tend to vary inversely with the amount of rainfall and directly with the amount of evaporation.

One of the most important influences affecting the size of ranches is the distance from the market. It is not only a big factor in determining the kind of stock run, but also in determining the quality and quantity to be run. The farther one goes from the market the less intensively will the land be used because the ranchman must select his breeds of stock according to their ability to transport themselves to the market. A long distance from the market means that neither old mother cows nor young animals are marketed. The former are left to die on the range because at any given time the prospect of another calf crop is worth more than the scrap value of the old cows so far from the market. Young animals are left to mature on the range. Therefore, the area required for most economic handling of livestock varies directly with the distance from the market.

The nature of the vegetation on the range may also be classed as an important factor in determining the size of ranches. It is very largely a product of soil, climate and to-

pography, but not wholly so. While the vegetation on the range is not a result of planting and cultivation, it may be influenced very greatly by the way it is grazed. The ranchman, if skilled in the management of his range, may supplant one type of grass with another. In the region under consideration it is said that the predominant grass at the time the ranchman first settled it, was the sage grass. Now that it has been grazed for several years the sage grass has been supplanted almost entirely by mesquite grass. What is true of grass will apply equally as well to brush and weeds.

If the vegetation grown is of a high quality and abundant, it tends to lessen the size of ranches. If the vegetation is especially adapted to the needs of a particular type of range animals, ranches tend to conform to the area best adapted to the management of those animals. Generally speaking, the size of ranches varies inversely with the quantity and quality of the natural vegetation.

### *Economic Factors*

The type of ranching followed influences the size of ranches. If the ranchman is running strictly a cattle ranch, he can superintend a larger area than he could if he were running cattle, sheep and goats. The ranchman who runs common stock can superintend the handling of greater numbers than if he were running high-class grades or purebred animals. The most intensive type of ranching is that which runs registered cattle, sheep and goats. In this study it was found that the percentage of calf crop varied inversely, and that the percentage of death losses varied directly, with the size of ranches. It also appeared that in buying ranches, men were inclined to pay more for land than the mere grazing value. If the land paid interest on, say, \$8.00 per acre the price was likely to be \$12.00 or \$15.00 per acre, the difference representing in part what the ranchman was willing to pay for the land as site value or a place to live and in part a speculation on the prospect of the land rising in value. Under these circumstances it behooves the ranchman to be as economical in the use of the land factor as possible. If by

changing from scrub to high-grade cattle he can reduce the area required for a ranch and still maintain or even increase his income, it is to his advantage to do so for he is reducing his capitalization and, relatively if not absolutely, increasing his returns on his investment.

If, for example, a ranchman running 500 scrub cows worth \$30.00 each, whose calves are worth \$15.00 each, on a ten-section ranch, has a death loss of 7 per cent. and gets an average annual calf crop raised of 65 per cent., his annual income would be 325 calves which at \$15.00 each are worth \$4,875.00. But he loses 35 cows annually which at \$30.00 each are worth \$1,050.00. Deducting this amount from the value of the calf crop, his gross income is reduced to \$3,825.00. If the grazing value of his land amounts to \$8.00 per acre, then the value of his ten sections is \$51,200.00. The interest on this amount at 8 per cent. is \$4,096.00. The breeding stock represents a value amounting to, say, \$15,600.00. The interest on this amount at 8 per cent. amounts to \$1,248.00. The interest on the land and livestock amounts to \$5,344.00. So, instead of realizing a profit on his cattle business, the ranchman sustains a loss amounting to \$1,519.00.

Should this ranchman reduce the size of his ranch and change to high-grade livestock, he might avoid bankruptcy. Suppose he reduces the area of his ranch to seven sections and stocks with 250 high-grade cows worth \$60.00 each. In so doing, let it be presumed that by virtue of closer supervision he reduces the average death loss from 7 per cent. to 4 per cent. and increases the calf crop raised from 65 to 80 per cent. His annual income would be 200 calves which at \$30.00 each would amount to \$6,000.00. But he loses 10 cows worth \$60.00 each or \$600.00 in all. Deducting this amount from the value of the calf crop, his gross income amounts to \$5,400.00. If the grazing value of his land is \$8.00 per acre, then his seven sections are worth \$35,840.00. At 8 per cent., his interest on land would amount to \$2,867.20. He has, say, \$16,000.00 invested in breeding stock. At 8 per cent., the interest on cattle amounts to \$1,280.00. Adding the interest on land to the interest of cattle, the total interest amounts to \$4,147.20. Deducting this from his gross income, he has

left \$1,252.80. It appears, therefore, that, other things being equal, a small ranch stocked with high-class cattle and properly looked after by the owner is preferable to a larger ranch stocked with scrub cattle and looked after in an indifferent manner.

The price of land has an important influence on the size of ranches. The rise in the price of land causes a greater intensity of use. Therefore, it lessens the amount of land which an individual or family can operate economically. With the high price of land, big ranches are not so readily built up even by energetic, ambitious men. The result is that the processes of breaking up ranches through inheritance and other means tend to go faster than the building up of large estates, provided the size of the ranchman's family does not decrease. In sections where cattlemen came in first and established purely cattle ranches, and where they are prejudiced against running sheep and goats, they will ultimately be supplanted by men who are willing and skillful in grazing all adapted types of livestock, though cattlemen may forestall such a change for a time. The men who practice diversified grazing are simply able to get more out of the land than those who run only one kind of stock and will, therefore, sooner or later control the grazing of their particular section.

Up to the present time the size of ranches has not been greatly influenced by the amount of machinery available for use in the ranch business. The motor truck is undoubtedly a factor tending to increase the size of ranches, but as yet the ultimate extent of its influence can hardly be predicted.

Windmills and gasoline engines have tended to increase the size of ranches in sections where pumping is necessary. Before the advent of the windmill, gasoline engines and storage reservoirs, the owners of ranches frequently had to pump water by horse power. This was slow and required a great deal of labor. The introduction of these facilities eliminated the possibility of losses which were due to a lack of water. Improved shearing machinery has very greatly lessened labor demands at shearing time, and enabled men to run many more sheep and goats safely than could have been run before such machines came into use. Improvements in machinery and

tools which lessen the number of men required during the busy seasons tend to increase the size of ranches. Preventives and remedies for the diseases of livestock, as a rule, tend to decrease the size of ranches necessary for the best development and utilization of the economic and social powers of the ranch family.

The amount and quality of labor demanded affects the size of ranches. If the ranchman is specializing in animals of superior quality, he must employ very skilled, reliable men. It is frequently difficult to secure these in sufficient numbers and thus a large ranch running superior animals necessarily is a risky business. Likewise that type of ranching which requires considerable seasonal labor tends to be eliminated. It often happens that the owner of a large flock finds it difficult to secure an adequate number of shearers or men to help him during lambing and kidding times. If he is unable to secure the required labor at these particular times his losses may be heavy. A man who runs various types of livestock has his labor demands spread out more evenly over the year and the risk of severe losses is correspondingly reduced. The smaller diversified ranches, therefore, tend to increase at the expense of the larger ranches.

The size of ranches is affected by the nature of the market for ranch products. If a ranchman is situated close to a livestock center where men come to buy high-class animals for breeding purposes, that sized ranch tends to predominate which offers the best advantages for breeding such stock. Men with very small ranches are not able to engage successfully in such a business because their overhead costs are too large and they are unable to secure the best classification of animals. Moreover, the extremely large ranches are not usually adapted to the production of this class of animals because they are unable to give each animal the proper care it demands when run in large numbers.

The lack of a developed market may prevent the production of certain types and breeds of animals. The physical conditions might, for example, justify the growing of goats in a given section, but on account of the fact that there is no established local market for goats or mohair, no one may wish



to go into the business. The ranches may thus continue indefinitely to be larger than they should be because of the absence of a well developed market for certain products. Nearness to market tends to lessen the size of ranches. If a railroad were built through Sutton County it would likely tend to reduce the size of ranches.

### *Political Factors*

The State government has exerted a marked influence in determining the size of ranches in Sutton County. The fundamental ideas of private ownership and operation of family-sized farms were undoubtedly brought in from other states. Moreover, the policies of parceling land out to individuals and the methods of transfers come from the same source. The Mexican influence on the land policy of Texas arises out of two facts. In the first place much of the land of Texas was first distributed under the Mexican government under the *empresario* system. When Texas became independent she did not attempt to uproot entirely what Mexico had done toward land distribution, but changed her policy for the remaining unappropriated domain. The Mexican government had been compelled to deal very extensively with semi-arid land in framing her land policy. Moreover, the Mexicans were more given to stock-raising than the people from the United States who settled in Texas. The Mexican idea was to give a settler some good land on the streams to farm and considerable more land back away from the stream to graze his herds on.

The Texas government took the land policy of the United States as the foundation for her own, but adopted Mexican ideas when they seemed more practical. The Mexican influence is most marked in that part of the Texas land policy which deals with semi-arid ranch lands. After 1880 the Texas government took the lead in insisting on parceling out the rest of her public domain on the basis of classes and grades of land and in attempting to work out the logical size for a ranch homestead.

The remaining lands were accordingly divided into agricultural land, grazing land, and forest land. In addition

to the above classes, grazing land was further sub-divided into dry land and watered land. The State Land Board provided in 1884 that a man desiring a homestead could buy one section of agricultural land or two sections of grazing land, or one section of each. In 1885 the Board ruled that any one qualified to take up land could purchase as much as three sections of unwatered grazing land. In 1887 the Texas legislature passed a law permitting the sale of four sections of unwatered grazing land to actual settlers.<sup>54</sup>

Sutton County contains some land that was classed as agricultural land, but the bulk was classed as dry grazing land. There were virtually no settlers in the county until about the 90's. The first land taken up in the county lay along the Llano River and was bought in the one-section units as provided by the State Land Board for the disposition of agricultural lands. When the land along the rivers was taken up, people pushed out on the dry grazing lands where they were able to purchase as many as four sections. In 1906, when the authorities thought that all the best land had been sold or filed upon, the homestead unit for sale was raised to eight sections.

It is not known exactly how many ranches resulted from each of these laws. The influence is most apparent, however, on the group of one-section ranches. Eight of the ten one-section ranches studied are still in the hands of the men who bought them from the State as homesteads. Several instances were found where one-section upland homesteads were taken, but which were later sold to the owners of larger ranches.

The effect of the four-section law is not so apparent. The main reason for this lies in the fact that the State granted or sold its land in alternate sections. Accordingly, a man taking up four sections from the State could, at the best, get them to touch at the corners. These facts have obscured the results of the four-section law. Much trading, buying and leasing had to take place before unified ranches were obtained. Many of the six-, seven-, eight-, and nine-section ranches are a result of the four-section rather than the eight-section law. Sometimes the railroad lands were sold to speculators

<sup>54</sup> Sayles, John and Henry, "Real Estate Laws of Texas," Volume 1, Article 392.

who wished to hold them. This fact accounts for a number of ranches in Sutton County whose owners lease some land.

Just as the four-section law tended to make six-, seven-, eight-, and nine-section ranches, so the eight-section law tended to make ranches ten to sixteen sections in size. Distinct influences of the eight-section law on the size of ranches were found in only a few cases, but it is probable that the influences were more marked than the studies indicate. Some of the largest ranches were evidently built up by ranchmen buying up railroad lands, county school lands, and homesteader's claims.

#### *Influence of the Individual on the Size of Ranches*

The ability of the man is the final test in determining the size of ranches. At any given time and in a region that is fairly uniform as to physical characteristics the major differences in the size of ranches are due to the differences in the abilities and ambitions of men.

The records of the 97 ranches under consideration show that there are men who are contented to manage one section and who are seemingly not able to acquire more land. Some of these one-section men are even having a difficult time holding what they have. There are other men who started in with a one-section ranch and have added one or two more sections. There are still other men who started in with no more property and no better opportunities than many of the present one-section ranchmen who have accumulated forty or fifty sections or even more. Some would say that these men had better luck. Count it luck if one will, they seized the opportunities that were afforded; they sold or bought to a little better advantage than their neighbors; they analyzed situations and took risks; they may have handled labor to a little better advantage; they may have cared for their livestock a little better, or excelled in some of the other aspects of ranching. Whatever the cause, the fact remains that they have managed well and accumulated property.

Young men sometimes inherit lands beyond their managerial ability. In such cases the ranches will either change hands or be divided up.

## CONCLUSIONS AS TO THE SIZE OF RANCHES

The ever-increasing demand for land and the seemingly large size of ranches as compared with farms, will tend to make the ranch peculiarly susceptible to the menace of too small units. People in a farming country often do not appreciate the land requirements for successful ranching. No effort on the part of the State to encourage the proper size of farms and ranches can produce the desired effects unless that encouragement takes into account the differences between farms and ranches in their relations to the land factor. Any attempt at classification which makes no distinction between farm land and ranch land and between the different grades of each, and which is based on area alone, will be a menace to the best interests of both farming and ranching. The family-sized farms in the better farming areas of Texas range from 80 to 160 acres. The family-sized ranches in the permanent ranching country range from four to twenty sections, or from 2,560 to 12,800.

A satisfactory land classification must be based on the physical characteristics and economic possibilities of the land and the varying abilities of men to utilize them efficiently. In disposing of her public lands the State of Texas made a laudable attempt to classify them according to their most appropriate uses and to distribute them in what was considered suitable economic units at the time they were disposed of. The "rough and ready" classification of course was not always accurate, but it was a step in the right direction and should be followed up with a more accurate classification now that we are facing the necessity of a more intensive use of the land.

The maintenance of ranches of appropriate size is fundamental in working out a satisfactory credit system. No banker, if he knows his business and desires to promote the best interests of his community, prefers to loan money to a man whose holding is too small to be efficiently operated and whose income is inadequate to properly support his family. On the other hand, if the ranches are too large for the most successful operation ranch loans are risky business.

The best basis for credit in a ranch country is for every ranchman to have those amounts of land, labor and capital which are best suited to his ability as a manager, and it should be the hope of the banker to promote such condition. The credit of a farming or ranching community must be based on its productivity and anything which increases its productivity should increase its credit facilities.

Heretofore the question of the proper size of ranches has received very little attention for the reason that very little has been known of the economic features of the industry. The idea of a permanent ranching industry could gain but little if any foothold as long as the impression prevailed that ranching would ultimately give way to some sort of farming. As a result, the economic analysis of ranching for the purpose of finding its place in our National economy has just begun.

Undoubtedly there are ranches on the Edwards Plateau which are too large for most efficient operation. There are, however, a greater number of ranches which are even now too small for economic production. The prosperity of the ranching country will be promoted best by a land policy which on the one hand discourages too great an accumulation in a few hands and which on the other seeks to prevent an excessive subdivision of the land.

## CHAPTER VII

# TENURE OF RANCH LAND

## SYSTEMS OF LAND TENURE

Generally speaking, land tenure refers to the way land is held for use. The two leading types of land tenure are lease-hold and free-hold. Land may be held under other forms such as common land and copy-hold, but the significance of land so held in America is so small that it need not claim one's attention in this discussion. Free-hold or *fee simple* means perpetual ownership of certain rights to land. Lease-hold means the use of the rights of the owner of the land by a tenant for a certain definite time. Lease-hold may be obtained from the government, a corporation or an individual as owner of the land.

As pointed out in Chapter V, there are different classes of land, such as forest land, mineral land and agricultural land, which are devoted to different uses. Because of these facts, there are likewise principles governing the tenure of each class of land that must be observed if satisfactory utilization is to be obtained. A system of tenure which is conducive to most efficient production in the case of agricultural land may, for example, result in waste and inefficiency in the use of forest and mineral lands. It is necessary, therefore, to adapt the kind of tenure, the size of holdings, and similar problems to each class of land separately if the best results are to be expected.

By way of illustration, it may be said that the fundamental problems in the use of mineral lands grow out of the fact that minerals are limited in quantity, are not reproducible and must be discovered. The ideal system of tenure for such land is one that prevents waste and leads to the discovery of an adequate number of mines.

Forests are reproducible, but the reproduction requires a long time and is attended with great and varied risks. Moreover, forests often have significance beyond the mere production of timber, as in the case of forests on watersheds and along streams. In time of war, the existence and proper location of ample forest supplies are of tremendous National significance. An ideal system of tenure for forest land is one, then, which leads to the production of ample forest supplies on the land most appropriate for such uses. Thus it may be shown that each class of land has its peculiar characteristics which must be considered in working out satisfactory systems of land tenure.

Agricultural land is devoted primarily to the production of crops which are harvested annually. The primary problem is soil conservation. An ever-increasing population must be fed and clothed from the products of the land. Aside from production, however, the ownership of agricultural land is given the widest possible distribution as a means of assuring political stability. With these ends in view, therefore, an ideal system of tenure for agricultural lands is one which assures the greatest efficiency in production and at the same time gives the greatest number of citizens a "stake" in the land.

Ranch lands, like farm lands, are used for the production of food and clothing and, therefore, may be classed as agricultural lands. In the main, the problems of tenure for these two types of land are similar. The differences in the size of the units demanded for efficient operation and those of management have led some men to believe that ranch lands, particularly the remaining unapportioned public domain, should be utilized under a different form of tenure from farm lands. Those opposed to private ownership propose in lieu thereof a system of government ownership and leasing to stockmen with grazing rights regulated and supervised by government grazing experts. Many men, however, who wish to see the widest possible distribution of private property in land, because they believe that private ownership is the greatest known stimulus to production, long to see the remaining unappropriated public domain classified as to use and the grazing lands granted to settlers in units of adequate size to properly maintain a

family. These men believe in the widest possible distribution of private property in agricultural lands consistent with efficiency in production on the one hand, and a desirable standard of living for the settler on the other. They believe that private ownership of range lands is equally as effective in stimulating production as in the case of farm lands.

The test of whether land should be held under one system of tenure or another is the relative advantage of one over the other when considered from both the individual and the social viewpoints. If private property leads the individual to use the land in a manner consistent with the best interests of society, it is to be desired. If, however, private property in land leads the individual into direct conflict with the collective interests of all the people, then some better form of tenure should prevail.

Private property in agricultural lands, to be desirable, should lead the individual to grow the quality, quantity and variety of products socially demanded and to grow them without permanently impairing the optimum productivity of the soil.

The consciousness of security of tenure and the hope of the accumulation of private property are widely recognized as fundamental to industry and thrift on the part of farmers. Likewise, private property in ranch lands inspires the owners to the conservation of the ranges and to efficiency in production.

Does private property in ranch lands complicate or simplify the problems of ranch management? The two most perplexing problems facing the ranchmen during periods of drouth are the preventing of damage to the range and the securing of adequate finances to buy feed and hire the extra labor required. Ranchmen who own their land are more inclined to protect their ranges because of the capital value involved. Moreover, the land furnishes a margin of credit which enables the landowner to finance feed operations that the man on leased land does not have.

Privately owned grazing lands are not always handled exactly like they would be under government control, because the private individual is seeking the greatest net return from



his investment. Thus, while a ranchman may decide that the normal carrying capacity of his range is a certain number of animals, he does not limit himself rigidly to the grazing of that number. A policy which produces the greatest amount of forage may not always produce the greatest amount of economic value. For example, a ranchman may relatively overstock his ranges under conditions of abnormally high prices with the idea of under-stocking to rebuild them when prices are low.

The adjustment of the number of livestock to the carrying capacity of the range is only one factor in the process of preserving or increasing the productive capacity of the range and of improving the efficiency of production. Developments in Sutton County demonstrate that much capital may be used profitably in a ranch country in making permanent improvements. Most of these capital improvements require constant care to prevent rapid depreciation. It is impossible to expect tenants to either build or keep up such improvements.

In regions where sub-surface water is not available and where permanent surface water is limited to a restricted number of places, the problem becomes one of government regulation of water rights rather than range rights. Individuals should not be permitted to control large tracts of land by merely securing control of the land around strategic water holes. A proper system of water rights, such as are common in irrigation areas, could be made to solve this problem.

Within the last ten years the ranches of Sutton County have been fenced with wolf-proof fences. The primary function of these fences was the protection which they afforded against wild animals. The number of miles of cross-fences being put in at the present time, however, shows that such fences serve other important purposes. They aid in the scientific classification and management of livestock and make possible the use of improved methods in grazing. Other examples of the advantages of capital improvements on privately owned ranches are wells, windmills, reservoirs, dipping vats and ranch buildings.

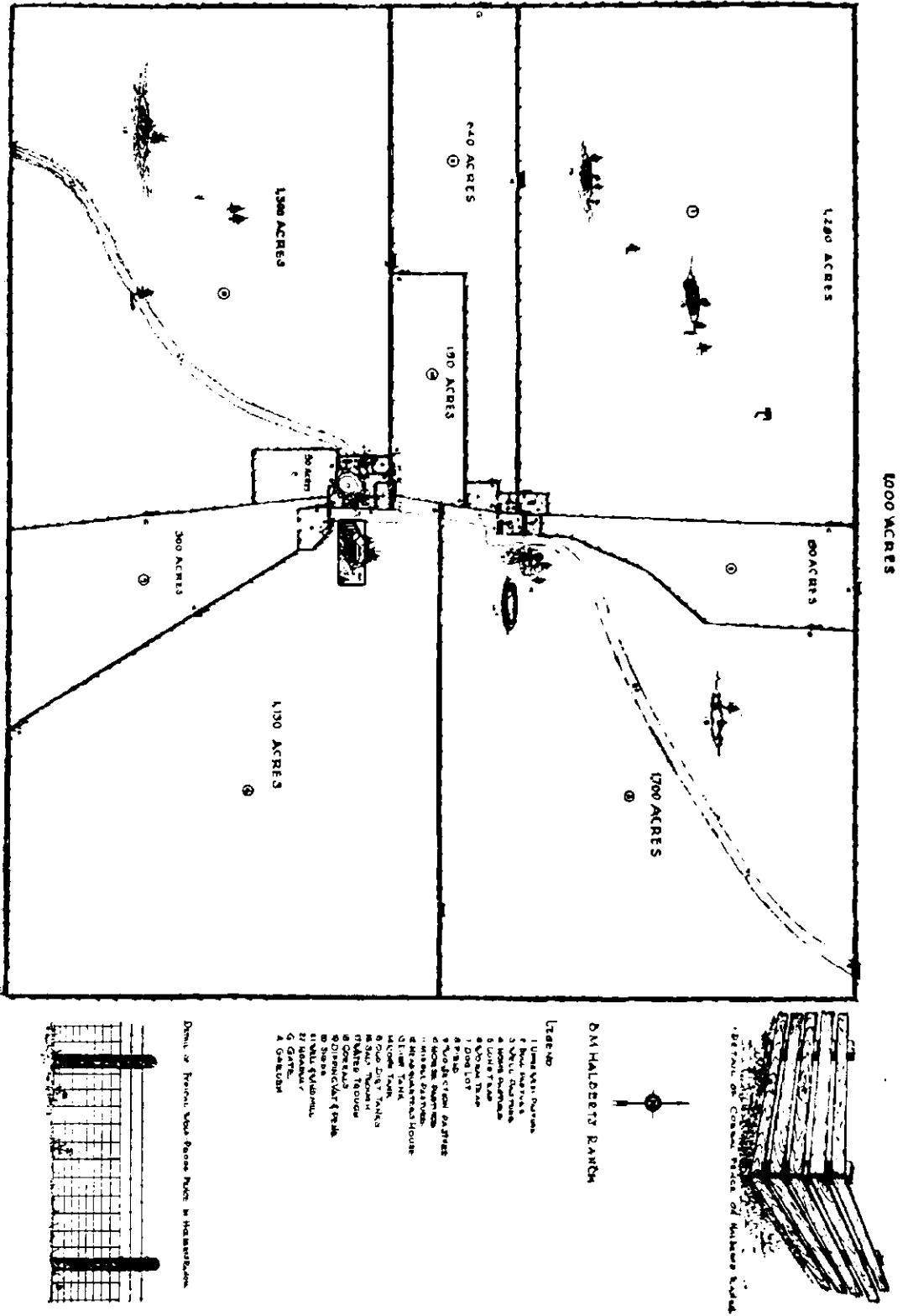


Figure 27. Lay-out of a 10 1-2-section ranch in Sutton County.

Figure 27 is a sketch of an owner-operated ranch of ten and one-half sections, showing how capital has been used to improve carrying capacity to facilitate management.

The problems of ranch management for efficient production do not depend upon the mere fact of quantity and quality of equipment or faultless rules of management so much as upon the disposition of the operators to use the equipment and to carry out the managerial plans devised. The individuals who for the present desire to lease are looking forward to a period of ownership. Seventy-four out of 97 Sutton County ranchmen answered the question, "Is ownership better than lease?" in the affirmative; four answered in the negative; eight said that it depended upon circumstances, and eleven did not answer the question.

The main reasons offered by the ranchmen for private ownership as opposed to lease-hold were the guarantees of security of tenure and independence in making improvements and in management. The possibility of gain through increased value of land was prominent in the minds of about 25 per cent. of the ranchmen. Some look upon ranch ownership as a sort of savings bank. They believe that the rise in land values will pay interest on the investment in land and that the money which would have to be paid to lease the same land is so much saved. Others emphasize the fact that land ownership gives a man a standing that he could never get as a mere lease-holder. They feel that land ownership lends stability to the man and to the community, that land being readily acceptable as security for loans enables owners to secure credit when lessees are unable to do so. Moreover, loan companies hesitate to lend money on livestock when the owner's chances of finding suitable range for it depend upon his ability to lease land.

Table 22 shows the answers to the question, "Why is ownership or lease better?"

There is a satisfaction obtained from private property in land for which no adequate substitute has been found. Countries which have tried the lease-hold have almost invariably developed a class of dissatisfied citizens who spend a good part of their time trying to have the lease-holds changed into free-

TABLE 22

Showing answers to the question "Is ownership better than Lease?"; number of answers given and classification of answers by reasons given.

Groups of Ranches By Sizes	Number of Ranch- men Answering question	Number of Reasons Given	Reasons for Favoring Ownership										Reasons for Favoring Lease	
			Security	"Boss"	Credit	Savings Bank	Improvement	Increase in Value	Permanency	Joy of Ownership	Less Expensive	Less Expensive	More Work- ing Capital	
<b>Total</b> .....	86	152	46	23	7	4	28	12	6	7	7	6	6	6
Under 1 section .....	1	3	1	0	0	0	1	0	0	1	0	0	0	0
1 and under 2 sections .....	7	10	5	1	0	0	2	1	0	1	0	0	0	0
2 and under 4 sections .....	4	8	3	1	1	1	0	1	0	1	0	0	0	0
4 and under 8 sections .....	23	38	10	7	3	1	7	3	2	0	1	2	2	2
8 and under 12 sections .....	17	31	5	3	2	1	7	2	3	2	5	1	0	0
12 and under 20 sections .....	15	30	10	5	1	1	3	2	1	1	1	2	3	3
20 and under 32 sections .....	9	15	6	4	0	0	4	1	0	0	0	0	0	0
32 sections and above .....	10	17	6	2	0	0	4	2	0	1	0	1	1	1

holds. There are instances where this is not true and the reason for their seeming contentment is the fact that they are leasing land for much less than its economic rent and are, therefore, profiting at the expense of the rest of the people of the state or community.

Insofar as Sutton County is concerned, there is no questioning the fact that free-hold has been fundamental in making it one of the most notable regions in the United States for improved ranching methods. The carrying capacity of the ranges has been increased and the stock is better cared for with less labor than formerly when the lands were leased. Any line of endeavor, therefore, which offers opportunities for the acquisition of private property in land and at the same time facilitates production and social development, should be left as free as possible of governmental regulations and restrictions.

The nations of the world are realizing more keenly than ever the importance of giving as many men a "stake" in the country as possible. It is the surest guarantee of the preservation of our ideals of a democratic government supported by a self-reliant, progressive people. There are instances, however, where lands may perform a dual service. Forest land often furnishes considerable grazing. In this case government regulation is necessary to protect the forests.

TENURE OF THE 97 RANCHES STUDIED IN SUTTON COUNTY, TEXAS

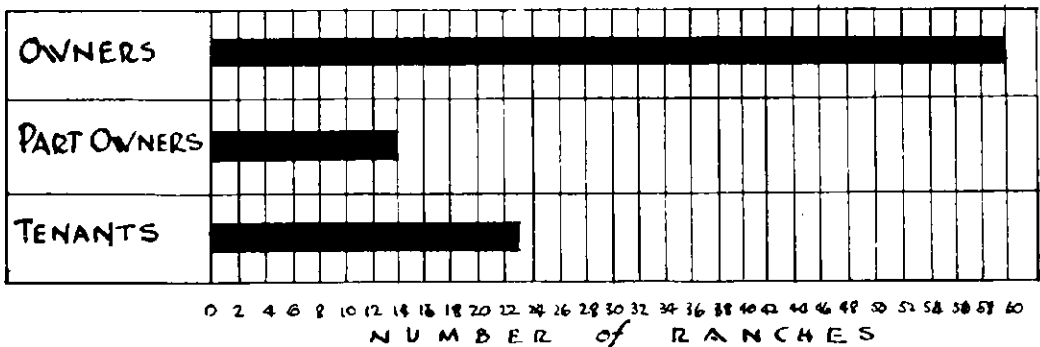


Figure 28

## RANCH LAND TENURE IN SUTTON COUNTY

The State of Texas has adhered, from the beginning, to the policy of private property in lands. While it set aside enormous areas for educational purposes, the presumption was that these lands should ultimately be sold to individuals. With the exception of a small amount of County School Lands, the lands of Sutton County are held in free-hold by individuals.

The tenure of the 97 ranches studied in Sutton County, it is believed, is fairly representative of the Edwards Plateau. Of these ranches, 60 out of 97 are owned by the operators; 14 are partly owned; and 23 are leased.

The owners of partly leased ranches have most of the characteristics of owners. There are cases where the owners of partly owned ranches may own eight sections and lease one, or own eleven sections and lease two or three. In no case out of the 14 does a man lease more land than he owns. Most of these men are part owners because the owner of a section within or adjoining the ranchman's land refused to sell his land, but is willing to lease it to the ranchman at current rentals. There are a few who are leasing some land because they are able to manage more land than they are able to buy. These men are in the process of building up a suitable-sized ranch. If the part owners are classed as owners, 76 per cent. of the ranchmen own their ranches.

The largest per cent. of tenancy is found among the larger and smaller ranches. The greatest concentration of ownership lies within those groups which have been classed as the family sized ranches. The group having the highest percentage of ownership is the one containing ranches of 20 to 32 sections, but the percentage in the group containing 8 to 12 sections is almost as large.

Table 23 shows the form of land tenure on the 97 ranches studied in Sutton County.

Small ranches are better suited to stock-raising under tenant management than larger ones. It is easier to find another range and move one's stock to it where the herds or flocks are small. If the lessee is unable to find a suitable ranch, he has the option of moving into the farming districts and start-

TABLE 23

Showing classifications of ranches into ranches owned, leased, part owned, part leased, and the percentage of ranches owned, leased, part owned and part leased.

Groups of Ranches	Number of Ranches Studied	Number of Ranches Owned	Number of Ranches Leased	Number of Ranches Part Owned and Part Leased	Per Cent of Ranches Owned	Per Cent of Ranches Leased	Per Cent of Ranches and Part Owned and Part Leased
Total	97	60	23	14	62	24	14
Under 1 section	1	0	1	0	0	100	0
1 and under 2 sections	10	6	4	0	60	40	0
2 and under 4 sections	5	3	1	1	60	20	20
4 and under 8 sections	25	14	5	6	56	20	24
8 and under 12 sections	19	14	3	2	74	16	10
12 and under 20 sections	18	10	5	3	55	28	17
20 and under 32 sections	9	7	1	1	78	11	11
32 sections and above	10	6	3	1	60	30	10

ing a stock-farm. A lessee engaged in raising stock usually finds it both difficult and expensive to move to a new range, while one grazing steers or muttons finds moving less difficult and hazardous and also has the option of selling out.

### *Length of Tenure*

Length and security of tenure are important factors in obtaining stability and progress in ranching as well as in any other line of business. The ranch owners of Sutton County have owned their ranches on an average of thirteen years. The group having the longest period of ownership is the one containing 20 to 32 sections. The average for this group was 20 years. Those showing the shortest period of ownership are the two- and under four-section group and the four- and under eight-section group. Their average was nine years.

The sizes of many ranches are frequently built up by periodic buying of additional land and since the larger ranches require much greater capital for purchase, it would naturally appear that they should be owned for a longer time because the owners probably began building up their properties many years ago and have been successful partly because of their long tenure. If the length of tenure is measured from the date of last acquisition of additional land, the large ranches show a very short tenure while that of the small ranches is not materially changed.

The average length of tenure of ranchmen on leased land as shown by the 23 leased ranches out of the 97 studied, is three years. The groups showing the longest period of leases are the eight- and under twelve-section group and the twenty- and under thirty-two-section group. The average length of time for both groups was five years. The ranches under four sections are usually leased by the year. Four- to eight-section ranches are most often leased for a period of three years. Ranches containing eight sections or more are almost invariably leased for a period of five years.

The differences shown here in the length of lease of the different sized ranches are due primarily to the character of the business. No man, for example, can afford to stock a



ranch containing twelve or more sections for stock-raising purposes, when he has no assurance of a place to run his stock after the expiration of a three-year lease. The difficulties, of course, increase as the size of the business increases. A lessee of one of the big ranches was in the predicament of either having his range taken away or being forced to pay a much higher rental, at the time this survey was being made. Such a man is at the mercy of the land owner when he has to lease so much land because there are very few large ranches to be leased. The lessee must either pay the price asked or else sell out his stock. The risk and the cost are too great to undertake an enterprise on such a large scale for a period of less than ten years.

The part owned and the part leased ranches show a tenure turn-over almost equal to that of the leased ranches. The average length of tenure for these ranches is only three years. The longest period of ownership is seven years, in the group containing eight to twelve sections. The shortest period in any one group is two years in the twelve- and under twenty-section ranches. The leased sections in these partly owned ranches have been leased on an average of three years. Three of the groups, the four- and under eight-section group, the twelve- and under twenty-section group, and the thirty-two-section and over group, show an average length of lease of five years. The shortest lease of those reporting is two years, in the four- to eight-section group. The data concerning ownership and lease of partly owned ranches indicate that this is frequently a means of obtaining ownership of a proper-sized ranch.

In dealing with such a problem as the length of ownership or lease where there are so few cases as here studied, the simple average as given above is frequently misleading. The modal average often gives the best results under such circumstances. When such an average is used the groups of ranches containing eight and under twelve sections show the greatest period of ownership. The length of ownership most common among the entire 97 ranches is fourteen years. The modal average applied to the lease shows that the prevailing length of

TABLE 24  
Showing length of tenure by simple average, median, and mode; ranches grouped according to size.

Groups of Ranches By Sizes	Number of Ranches Studied	Length of Ownership			Length of Lease			Length of Time						
		Simple Average	Median	Mode	Simple Average	Median	Mode	Portion Owned			Portion Leased			
								Simple Average	Median	Mode	Simple Average	Median	Mode	
Total	97	13	13-14	14	3	3-5	5	4	0	0	0	3	0	0
Under 1 section	1	0	0	0	1	1	1	0	0	0	0	0	0	0
1 and under 2 sections	10	17	17	0	1	1	1	0	0	0	0	0	0	0
2 and under 4 sections	5	9	7	0	1	1	1	3	3	3	3	5	5	5
4 and under 8 sections	25	9	4-12	1	3	3	3	6	4-5	5	5	2	1-2	1
8 and under 12 sections	19	13	14-15	14-18	5	5	5	7	9-4	0	0	3	1-5	0
12 and under 20 sections	18	13	13-16	4-20	4	3-5	5	2	1-3	1	1	5	3	0
20 and under 32 sections	9	20	14	4-0	5	5	5	3	3	3	3	4	4	4
32 sections and above	10	17	20-22	3	4	2-5	5	3	3	3	3	5	5	5

55 Where two numbers are given, median lies between.  
56 Ibid.

lease among the small ranches is one year, three years among the medium sized ranches, and five years for the large ranches.

Table 24 shows the average tenure by groups of owners, part owners, and tenants, derived by the simple average, the median, and the mode.

PROBLEMS OF ACQUIRING A RANCH

The intending ranchman has several alternatives open to him in his efforts to acquire a ranch. The statistics in Table 25 show that a great majority of ranchmen have acquired their ranches by purchase. The next largest group is composed of those who have acquired their ranches by lease. There are some who own a part of their land acquired either by purchase or inheritance and who lease a part of their land.

Table 25 shows how the 97 ranches studied in Sutton County are held, and how ownership was obtained in each case.

METHODS BY WHICH OPERATORS OBTAINED THE 60 OWNED RANCHES STUDIED IN SUTTON COUNTY, TEXAS

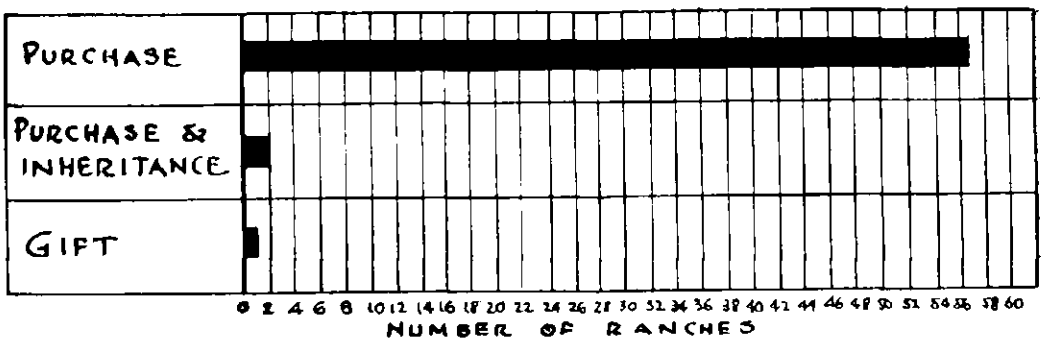


Figure 29.

Probably the most striking fact in regard to the methods of obtaining ranches in Sutton County is the very small number of instances wherein ranches have been acquired by inheritance. The absence of inherited ranches is explained very largely by the fact that the country is comparatively

TABLE 25

Showing number of ranches owned; number part owned and part leased; number leased; and manner of acquiring ownership.

Groups of Ranches By Sizes	Ranches Studied		Ranches Operated by Owner				Ranches Part Owned and Part Leased		Ranches Leased
	Number of Ranches Studied	Number	Acquired by Purchase	Acquired by Gift	Acquired by Part Inheri- tance and Part by Purchase	Number	Owned Part		Number
							Purchased	Inheritance	
Total .....	97	60	57	1	2	14	13	1	23
Under 1 section .....	1	0	0	0	0	0	0	0	1
1 and under 2 sections .....	10	6	5	1	0	0	0	0	4
2 and under 4 sections .....	5	3	3	0	0	1	1	0	1
4 and under 8 sections .....	25	14	12	0	2	6	5	1	5
8 and under 12 sections .....	19	14	14	0	0	2	2	0	3
12 and under 20 sections .....	18	10	10	0	0	3	3	0	5
20 and under 32 sections .....	9	7	7	0	0	1	1	0	1
32 sections and above .....	10	6	6	0	0	1	1	0	8

new and that not a very large per cent. of the ranches has passed into the hands of the second generation. The fact that large numbers of children of ranchmen are interested in ranching and the further fact that many of the present owners are getting old would lead to the conclusion that there will be a comparatively large number of ranches inherited in the future.

The purchaser of a modern ranch must possess a considerable amount of capital. Usually the first payment required is one-half to one-fourth of the purchase price. If a man buys only one section he will need about three thousand dollars. Should he wish to buy a six-section ranch he will need about fifteen thousand dollars, or more.

In addition to the necessary money for the purchase of land, the prospective ranchman must be able to stock the land. The amount of money necessary to stock a ranch is normally about three thousand dollars per section. Ordinarily it is not difficult to borrow a third to a half of this amount with the livestock serving as security.

Estimated on the basis of the amount of capital required to get into the ranch business, it would seem that the possibilities of the poor man's acquiring a ranch outright by purchase are out of the question. In fact, there is no question that has become more serious for poor ranchmen than the disappearance of the frontier and the consequent rise in the price of land. The scarcity of lands and the rapid rise in the price of range products have caused great increases in the value of ranch lands. This new condition developed while the original owners were still living. Most of them got their land at a comparatively low price and have had the benefit of rising prices. Many of them assert, however, that it is no more difficult to purchase and pay for a ranch now than it was thirty years ago when they bought. If they had been called upon to pay the money down or if there were the same assurances that the price of land would continue to rise, their contention would be eminently true. The present purchaser, it is true, has to pay a larger principal, but the prices of the products out of which he is to pay for the land have

likewise increased, but probably not in proportion to land prices.

In 1890 wages of hired hands ranged around ten dollars per month and board. The price of grazing land was about one dollar per acre. Wages have risen now to about fifty dollars per month, and the price of land of the quality that was bought in 1890 for one dollar per acre sells at about ten dollars per acre now without improvements. If the laborer in the earlier days saved half his wages he could buy five acres of land per month. If the same man were to invest half his wages in land at present prices, he would be able to buy two and one-half acres under present conditions. In fact, the disappearance of cheap land is making the problem of securing a ranch by purchase increasingly difficult. It must ever be kept in mind, however, that the man who earns an improved ranch has much more than the man who owned the ranch thirty years ago. The wolf-proof fences, wells, dipping vats, buildings and other improvements, make a much more efficient production unit than the same area twenty years ago. It appears, therefore, that the young men of today have opportunities to become ranch owners, but that considerably more time will be required than was necessary twenty years ago.

The probabilities are that tenancy will increase in the future, especially the number related to the owners. An increase of the number of tenants who expect to later inherit the ranches they operate may be viewed with entire complacency, but the problems of range conservation are such that a pronounced increase of tenants unrelated to the owners must be considered as unfavorable to the best interests of the country. Ranch resources such as forage cover and water facilities, lend themselves to greater extremes of exploitation over short periods of time than farm resources. In the course of a five-year period a poor tenant can easily damage a highly improved ranch more than the total amount of the lease money.

With the rise in the price of land and the resulting demand for leasable ranches, some method may be found to induce the tenant to take better care of the improvements and

refrain from over-stocking. Ranching is a type of business that demands ownership for best results and it is doubtful, therefore, if tenancy will ever attain alarming proportions in a ranch country. Tenancy will undoubtedly function as a step in the movement from the status of a laborer to that of ranch owner, but the nature of the business is such that it will never be as important in this respect as tenancy in a farming district.

A more important avenue through which the laborer passes from ranch-hand to owner is the partnership. Many of the more substantial ranchmen in Sutton County have advanced to ownership through this avenue.

The ambitious young man begins as a laborer with some ranchman. He demonstrates his ability and willingness to handle livestock. He expresses a desire to become a property owner and shows that his interest in the business is intensified by such ownership. The ranchman pays him a certain proportion of his wage in livestock which he is permitted to run in the ranch pastures. This may be considered the first step in climbing the ladder toward ownership.

If the laborer appreciates the opportunity of having stock of his own, and increases his interest in the business because of the fact that he is a property owner, the ranchman will often help him secure a ranch either by purchase or lease, to operate in some form of partnership. Usually the ranchman furnishes the financial backing and half of the stock, and the laborer furnishes half the stock and the labor. The marketing may be done by either or both, but is more often done by the older ranchman because he is in a better bargaining position. The expenses of securing capital are borne equally. This division of resources is helpful to both the younger and the older ranchman. Finally the young ranchman accumulates enough capital and business experience to enable him to conduct an independent business. At such time the older ranchman sells out to him very often on credit. Even after the partnership has been terminated, the young man often seeks the advice of his former employer and partner and in times of need secures his financial backing.

This is the more logical means of securing ownership, because ranches above the family size are conducted with hired labor and not parceled out to tenants, as more often happens in a farming country.

In Sutton County there are about twenty-five young men developing into ranch owners by this method. About one-third are in each of the three stages mentioned. As the ranches become more highly improved, the owners will turn their properties over to tenants with greater reluctance. Moreover, the increases in the risks of waste through bad tenants and in the amount of capital required in ranching are making partnerships more popular.

The comparative advantages of the different methods of acquiring a ranch should be weighed carefully by every prospective ranch owner. The different methods have their peculiar advantages under different circumstances, but there are certain fundamental principles necessary to success under any method of acquisition.

The first essential in the attainment of the permanent possession of a ranch is the necessary ability to manage one. There are plenty of men who are strong enough financially to undertake the purchase and operation of a ranch who lack both the necessary skill and executive ability to succeed. Such men had better work for some successful ranchman as a laborer and then as a partner in their efforts to become successful ranchmen.

In addition to an ability to manage a ranch, the prospective owner must have considerable finance himself or strong financial backing. Many beginners fail to appreciate the need of adequate finance and undertake a venture in good times which they are unable to finance during times of severe reverses. It is during such times that over-sanguine young men lose all they have accumulated. The young ranchman who chooses a partnership with some older and more substantial ranchman may not seem to accumulate as fast as the more self-reliant man operating for himself in good times, but the chances are that he will be considerably ahead at the end of some severe drouth or market depression which makes a test of financial strength.



A ranchman's financial strength depends upon his character, the amount of capital he possesses, the condition of that capital, and his ability as a ranch manager. The ranchmen express the same idea when they assert that their credit depends on their honesty, the amount of grass they have, market and credit conditions, and their reputation for success.

#### LAND TENURE IN ITS RELATION TO PRICES OF LAND AND OF LEASES

The prices of land and the amounts paid for leases vary widely. There are some unimproved lands in Sutton County that would scarcely sell for five dollars per acre. Highly improved ranches of the family size type are selling for eighteen to twenty dollars per acre. The average price of all ranches that are selling is about fifteen dollars per acre.<sup>57</sup>

The effect of the increase in the price of land on the type of land tenure has not had time to work itself out. The unusually high prices of meat, wool and other ranch products caused an unprecedented rise in the price of land during the World War. Now that prices of ranch products are settling to pre-war levels, ranchmen are refusing to buy land at present prices. Ranch owners are loath to reduce the price of land, for they think that sooner or later it will sell readily at the high figures once obtainable. The result will undoubtedly be an increase in the number of leased ranches.

It takes more money to make the necessary first payment now than formerly. The prices of commodities have not remained as high in proportion as land prices. There has been a marked increase in the standards of living of most people, which takes a much larger proportion of the ranchman's income to pay current expenses. These factors prevent rapid accumulation and thus put off the period of ownership.

The variations in the prices of leases are much wider than the prices of land. The lowest price paid for a lease

---

<sup>57</sup> In August of 1920.

TABLE 26

Showing number of ranches leased or part leased; the number leased for fixed amount of cash, and number leased for share of income; and average amount paid per section on ranches leased for cash.

Groups of Ranches By Sizes	Number of Ranches Studied	Number of Ranches Leased or part Leased	Leased and Part Leased Ranches			Average Rent Paid on Ranches Leased for Cash	
			Fixed Amount of Cash	Share of Income	Per Section	Per Acre	
Total	97	37	35	2	\$261.00	\$0.41	
Under 1 section	1	1	1	0	500.00	.78	
1 and under 2 sections	10	4	3	1	473.00	.74	
2 and under 4 sections	5	2	2	0	441.00	.69	
4 and under 8 sections	25	11	11	0	254.00	.40	
8 and under 12 sections	19	5	5	0	317.00	.50	
12 and under 20 sections	18	8	7	1	213.00	.33	
20 and under 32 sections	9	2	2	0	153.00	.29	
32 sections and above	10	4	4	0	271.00	.42	

is seven and one-half cents per acre. The highest price paid is one dollar and nineteen cents. The average lease per acre of all leased land is forty-one cents.

The wide variation in the price of leased land is due to the difference in the quality of improvements on the land and whether it is strictly grazing land or partly grazing and partly agricultural land. The majority of ranches that are fairly well improved lease for fifty cents to seventy-five cents per acre. The odd sections belonging to absentee owners lease for ten to twenty-five cents per acre. The owners of these sections have, as a rule, put no improvements on them. Most of the leases are for cash six months in advance.

Table 26 shows the character of leases and the amounts of lease payments on the 37 ranches leased and partly leased out of the 97 ranches studied in Sutton County.

### THE BASIS OF LAND VALUES

There is a strong tendency for men to over-value ranch lands and then over-graze them or convert them into farms in an often fruitless effort to make them yield a normal return on their assumed valuation. The reputed price of these lands is usually based either on exceptional sales or on trades in which both parties over-value their properties. The productive powers of the land are, of course, taken into consideration, but only as one of several factors influencing prices paid. In addition to the productive value as grazing lands, other values enter in which are either only in part related or else wholly unrelated to the production of ranch products. These values may be classified as follows:

1. Productive Value, comprising the grazing value, permanent improvement value, and site value.
2. Personal Preference Value.
3. Speculative Value.

For example, a man may pay fifteen dollars per acre for a ranch. The productive value, we will say, is ten dollars per acre. This ten dollars may consist of, say, seven dollars for the grazing or productive value of the vegetation; two dollars and fifty cents for the value of the permanent

equipments, such as watering places, wells, windmills, reservoirs, fences and buildings; fifty cents for the productive site value which may comprise many items, such as nearness to market, the convenience of the location with reference to shipping points, trading towns, and the reputation of the locality for the production of feeders, stockers, or breeding stock of quality. The remaining five dollars paid per acre must be divided between personal preference value and speculative value in varying proportions depending upon whether the individual concerned is the more inclined to yield to personal preference or to the game of speculation.

Personal preference has reference to those peculiar attractions which a piece of property may have to its owner or prospective buyer. These attractions are of the sort which yield personal satisfaction rather than economic returns. If, however, these attractions, in addition to the personal satisfaction which they may yield, also possess more or less economic value, this element is included in productive site value, or productive value.

The speculative value of ranch lands includes all those chance gains which may be derived from the ownership of land. Men realize that there is a chance for lands to rise in value, due to many potentialities such as the possibility of discovering oils, gases and minerals, and of using the land for some higher form of farm or ranch production later on. Sutton County is an interior county, many miles from a railroad. The possibilities of getting a railroad and of further developing highways in and out in all directions have been capitalized in the speculative values of Sutton County lands. If the minerals are discovered or otherwise the land comes to yield a more valuable product, if the railroad is built or the highways are perfected, what was formerly speculative value may become wholly or in part at least productive value simply by the accomplishment of the purposes formerly contemplated.

The question may now be asked, "Was the ranchman, used as an example above, justified in paying fifteen dollars per acre for the land?" He may or may not have been, depending upon his several motives in buying. According to

our assumption, if he merely buys the land because of its usefulness as a factor of production in ranching, he could, of course, only pay the ten dollars per acre. If it has attractions, however, to him as a place to live, he may raise his bid in proportion to his estimate of the personal preference value of the particular land to him and his family.

Moreover, he may be willing to pay something in addition purely as a matter of speculation for the possibilities of the land rising in value because of certain potentialities already discovered. As to how far one may go into the business of land speculation, no specific advice can be given in so brief a discussion as this. The amount which a ranchman should pay for the speculative element in ranch lands will depend in part on the relative probabilities of the land in question yielding a more valuable product of one kind or another within a reasonable space of time, and in part on his financial circumstances. He must be able to take losses in case his land does not go up in price.

This entire question of the different sorts of value that are imputed to ranch lands is raised here not so much for the purpose of complete elaboration at this time, as to enable the ranchman to appreciate more fully just what he was paying for when he bought his ranch lands.

Obviously the ranch business proper should not be expected to yield a normal return on the investment in personal preference and speculative values. In the example above, the man who paid fifteen dollars per acre for ranch lands should expect, with good management, to secure a normal return on ten dollars per acre, and he should not expect the ranch business to produce rent, or interest, on either the personal preference or the speculative value.

Now the question may be raised, "How may one identify and measure these several forms of value in a particular tract of land?" The productive value of a ranch may be identified and measured with a fair degree of accuracy by taking an average of the net rents paid for the use of similar ranch lands and capitalizing it at the current rate of interest. If, for example, the net rent is sixty cents per acre on the average, then the average productive value of ranch lands in that section

should approximate the amount of which sixty cents is, let us say, six per cent., or ten dollars per acre.

Personal preference value is rather easily recognized, but to measure it is a more difficult matter. Roughly speaking, it is the amount which a prospective ranchman would pay for the ranch of his choice over and above what he would pay for just as good a ranch situated as close to market, but which does not attract him so much as a place to live and conduct his ranching business. The amount will vary with individuals. It may be nothing in the case of one man and, let us say, ten dollars in the case of another. It will vary in amount in accordance with the strength of one's preference as modified by his ability and willingness to pay for satisfaction of a personal rather than an economic nature.

Speculative value may be recognized as that amount which a man will pay for ranch land over and above the amount which he will pay for the productive and personal preference values. It may be based on the prospect of a general rise in values due to an increasing demand for ranches or upon the prospect of discovering minerals or other productive uses for the land. It may even be based on the hope that the present owner may later on find a buyer whose personal preference is so strong for the particular tract of land that he will pay a satisfactory premium for it over and above its productive and speculative values. In other words, men quite generally speculate upon the personal preference of a future buyer.

In practice a ranch should not be bought on the basis of the net rent realized in any particular year, but on that of the average net rent covering a period of years, let us say, eleven to twenty-two. One should also consider the comparative income and safety of similar investments in other forms of property.

If in addition to paying for the present productive powers of ranch lands, one wishes also to buy the potential productive power or speculative value, and to pay for the facilities to afford his personal satisfaction over and above those required for most efficient production, he may do so; but if he does, he must realize that in the one case he is speculating

on land values and in the other buying a consumption good. It is obviously impossible, therefore, for the ranchman to charge the ranch business proper with interest or rent against either of these two unproductive investments or to include them in his expenses of production.

It follows that the ranchman who pays more for a ranch than its productive value will justify, should in practice keep three sets of books. One set for his household expenses in which every dollar invested in land because of peculiar personal preference and pleasure should be listed as a personal or family expense along with such items as luxurious food, clothing, automobiles, entertainment, residences, and other non-essentials to efficiency in ranching. Another set of books should be kept for the amounts of money invested in his lands as a matter of speculation. The profits or losses on this part of the investment in land can be determined only when the land is actually sold.

Lastly, a third and more important set of books for recording and balancing the items relating to the ranching business proper. On these books should be entered neither the personal preference nor speculative value paid for the land, but only the amount paid for its productive value on the basis of its normal ability to yield net rent.

#### RELATION OF TYPE OF RANCH TENURE TO PRODUCTION

Ranch tenants operate larger ranches than the ranch owners or part owners. The average sized ranch of the owner who operates his ranch in Sutton County is 9,626 acres; of the part owner 7,748 acres; and of the tenant 12,012 acres.<sup>58</sup>

The average value of permanent improvements on owned ranches in Sutton County is much greater than on the tenant ranches. The average value of fences, for example, on tenant ranches is \$549.40 per section and \$661.11 per section on all owned ranches. The average value of wells, windmills, rock reservoirs, dipping vats and similar equipment, is \$358.40 per

<sup>58</sup> Table 25 shows the distribution of the size of ranches by the type of tenure.

section on the owned ranches and only \$243.20 per section on the leased ranches.

The state of repair of fences, windmills, and other equipment on most ranches operated by tenants is noticeably bad. Land owners quite generally complain of the shameful way tenants permit improvements to deteriorate, especially toward the time of the expiration of the lease.

The landlords claim that the tenants almost invariably over-graze. If the lease runs for five years ordinarily they begin to seriously over-graze about the third year and by the close of the fifth the pastures are stripped bare. Tenants make no effort to improve either the quality or the quantity of the vegetation on the range.

Tenants do not run as many heads of stock on the average as the ranch owner. This is due partly to the fact that the carrying capacity of leased ranches has been reduced by over-grazing. In August of 1920 the average number of carrying capacity units utilized by tenants, all types and classes of livestock considered, was 67.3 per section, while the number utilized by owners was 72.2.<sup>59</sup>

The quality of the livestock grown by the tenants is not as high as that of the livestock grown by owner-operators. Ranch tenants, for example, had one registered bull to 93 cows, whereas the owner-operators had one registered bull to 50 cows. The owner-operators ran one bull to 29 cows, while the tenants ran one bull to 66 cows. Fifty-seven per cent. of the ranch owners ran ewes of good to extra quality, whereas only 46 per cent. of the tenants ran sheep of this quality. Owner-operators ran one ram to 34 ewes, whereas the tenants ran one to 38 ewes. Eighty-two per cent. of the Angora goat bucks run by owner-operators was registered, while only 12 per cent. of the Angora bucks owned by the tenants was registered. Stated in other terms, the ranch owner-operators had one registered Angora buck to 56 does, while the tenants had only one registered buck to 406 does. Owner-operators ran one Angora buck to 46 does, while the tenants ran one to 59 does.

<sup>59</sup> One 750-pound mother cow equals one carrying capacity unit; other types and classes in proportion to age and weight. This is more fully explained in Chapter VIII, Carrying Capacity of the Ranges.



The amount of man labor per section on the leased ranches is more than on owned ranches because of the inadequate equipment found on most leased ranches.

AGE OF RANCH OPERATORS

The age of ranch operators is shown in Table 27. There seems to be no significant relation of the age of ranchmen to the size of ranches. The accompanying table shows that owners are on the average eleven years older than tenants and part tenants. The majority of ranch owners are between 40 and 60 years old. The greater number of part owners are between 30 and 50 years of age. The great majority of tenants, on the other hand, are between 20 and 40 years of age.

TABLE 27  
Average Age of Ranch Operators

Groups of Ranches By Sizes	Number of Ranches Studied	Average Age of Ranch Operators			
		All Operators	Operators Owning Ranch	Operators Leasing Ranch	Operators Owning Part of Ranch and Leasing Part
Total .....	97	47	51	40	40
Under 1 section .....	1	67	0	67	0
1 and under 2 sections .....	10	49	54	44	0
2 and under 4 sections .....	5	44	50	25	60
4 and under 8 sections .....	25	44	49	33	41
8 and under 12 sections .....	19	48	51	30	43
12 and under 20 sections .....	18	45	52	33	39
20 and under 32 sections .....	9	48	50	39	41
32 sections and above .....	10	45	50	41	28

60 Figures not available.

Table 28 shows the ages of the ranch owners, part owners, and tenants that reported their ages in this study, grouped according to their ages.

TABLE 28

Showing ages of 87 ranch operators in Sutton County

Age Groups	Number of Owners	Number of Part Owners	Number of Tenants
Total .....	55	13	18
20 and under 30 years of age	0	1	5
30 and under 40 years of age	7	6	6
40 and under 50 years of age	16	4	4
50 and under 60 years of age	19	2	2
60 and under 70 years of age	11	0	1
70 years and above .....	2	0	0

## PRINCIPLES OF RANCH SELECTION

No problem should give the young ranchman more concern than the selection of the ranch on which he is to work out his fortune and rear his family. Failures are often traceable to the fact that the owner of a particular ranch is trying to carry on a line of business which is not best suited to his ranch and locality. Time spent in analyzing these problems thoroughly pays big dividends.

The ranchman must first decide what kind of business he wishes to pursue. If he wishes, for example, to devote his entire time to cattle raising, he will select a region adapted to his chosen business. If he wishes to specialize in Angora goats he will go to the Live Oak Belt of the Edwards Plateau, rather than to the Plains. There are ranchmen in Sutton County whose lands are adapted to the production of several types of livestock while they insist on growing but

one or two. A man may have very rough, brushy land on his ranch, yet he insists that he would not have a goat on his place. Each year he produces a lot of feed that is never utilized. Such a man will sooner or later have to sell to a man who is capable and willing to run the required number of goats to utilize the range.

The ranchman who has decided on the line of business he wishes to follow must next locate the most desirable region. It is well, first of all, to locate a region where the soil, climate and natural vegetation are favorable to this type of business. The next problem is to test its possibilities with respect to the market for his products both present and potential. Finally he must weigh the relative social advantages and disadvantages. The prospective ranchman should examine every source of information which promises to enable him to make a wise selection. The agricultural colleges and experiment stations can often give very valuable information along these lines.

After choosing his line of business and locating the region best suited to it, he should select with care the particular ranch which seems to suit his purposes and which in that region makes the strongest appeal to his personal preferences. In making his choice, he should study the soil both as to depth and quality, examine the vegetation as to variety, quality and quantity. The prospective buyer should observe very closely what neighboring ranches are doing and make as accurate comparisons of soil types and climate as possible.

The ranchmen in Sutton County place more emphasis on the problem of feed production on the ranch than any other item. Out of the 67 men who answered the question, "What are the essentials of a good ranch?", 46 said *quantity, quality and variety of feed*.

Water is just as essential in producing range animals as feed. The prospective purchaser, therefore, having satisfied himself with regard to the feed producible on the ranch, should next examine the water supply. The essential points in regard to water are location, quantity, quality, and the expense necessary for obtaining it. If the ranch is insufficiently watered, then he must satisfy himself with regard to the

possibility of increasing the supply and the probable cost of the necessary increase. Twenty-nine out of the 67 men answering the question as to the basis of selection, mentioned the water supply.

Topography has an important influence on the types of animals to be run. The level to rolling lands seem to be most suitable to cattle and sheep, while the rolling to rough lands are suitable to goats. It is desirable to have some broken land on all ranches as a matter of natural protection to the livestock, and in its absence artificial protection must be provided. The prospective ranchman, therefore, should select land possessing topography suitable to the particular types of livestock which he desires to grow.

The distance from the market and the character of the road to the market are important considerations in the selection of a ranch. The distance from the market for the products of the range has two important aspects, the distance from a shipping point and the distance from a central market. The importance of the distance from the market has been very materially increased by the increase in freight rates. The essential points to be considered in estimating the value of distance from the market are the shrinkage of the stock, due to driving and shipping the extra distance, the extra amount of expense and time required because of the greater distance, and the increased risk and losses due to the longer time required as a result of the longer distance. Moreover, a man buying a ranch must keep in mind the marketability of that ranch. The number of buyers who would be interested in the purchase of his ranch products varies inversely with the distance from the market.

A ranchman must not only sell, but he must buy. In some aspects location for buying purposes is more important than for selling purposes. The owner makes more trips to the market place during the year for buying than selling purposes. During severe drouths, distance from the point to which feed is shipped may become of major importance. If a man has to haul feed for hundreds of livestock, the distance of a few miles is an extremely important factor.

The choice of a ranch of suitable size for one's individual needs is of vital importance. The two important factors determining the most suitable size for any individual are his own managerial abilities and his financial strength. The studies thus far indicate that most men are inclined to want more land than they can manage properly or pay for in reasonable time. This is due very largely to a tendency toward speculation based on an abiding faith in a general rise in land values.

The financial strength of the man, however, is not always a fair test of the size of ranch he should buy. Inherited wealth will often lead young men to buy more than they can manage. On the other hand, if the young man has earned his money his funds are often limited and he may take a ranch too small for his ability. In no case ought one to buy a ranch which he could not finance under adverse circumstances.

The improvements and general layout of the ranch should be very closely scrutinized. It may often happen that a ranchman has spent large sums of money without plan in improving his property. Expensive fencing may have been built in such a way that parts of it are a liability rather than an asset for efficient managerial purposes. The quality and state of repair of all permanent improvements must be carefully considered.

Ranches are bought primarily because of their capacity and efficiency to produce economic goods, but that is not the only motive. Ranching is a means of producing the goods which one can use in the purchase of the goods he desires and not an end within itself. The ranchman must live and his family must live. The wise chooser selects a ranch that offers the easiest access to the best available social advantages such as proximity to trading centers, schools and churches.

Table 29 gives an analysis of the ranchmen's answers to the question, "What are the essentials of a good ranch?"

When should a man buy a ranch? The circumstances determining when a man should buy a ranch are so numerous and variable that it is obviously impossible to consider all that may

TABLE 29 -  
Showing the answers of the ranchmen to the question, "What are the essentials of a good ranch?"

Groups of Ranches By Sizes	Problem and Number of Times Stated									
	Number of Ranches Studied	Number of Operators Reporting	Vegetation and Soil	Water	Topography	Shelter Afforded	Improvements	Location	Climate	
Total .....	97	67	46	29	20	10	8	6	2	
Under 1 section .....	1	1	1	1	0	0	0	0	0	
1 and under 2 sections .....	10	5	2	2	2	0	0	0	0	
2 and under 4 sections .....	5	5	4	1	1	1	1	1	0	
4 and under 8 sections .....	25	17	12	6	4	3	0	1	1	
8 and under 12 sections .....	19	16	14	9	5	4	5	2	0	
12 and under 20 sections .....	18	10	6	4	4	0	0	1	0	
20 and under 32 sections .....	9	7	3	2	1	2	1	0	1	
32 sections and above .....	10	6	4	4	3	0	1	1	0	

be involved in any particular purchase. There are some general principles, however, which are worthy of consideration.

1. Cato<sup>61</sup> offers some good advice concerning the buying of a farm which seems to be applicable to the buying of a ranch. He says:<sup>62</sup>

“When you have decided to purchase a farm, be careful not to buy rashly; do not spare your visits and be not content with a single tour of inspection. The more you go, the more will the place please you, if it be worth your attention. Give heed to the appearance of the neighbourhood,—a flourishing country should show its prosperity. ‘When you go in, look about, so that, when needs be, you can find your way out.’

“Take care that you choose a good climate, not subject to destructive storms, and a soil that is naturally strong. If possible, your farm should be at the foot of a mountain, looking to the South, in a healthy situation, where labour and cattle can be had, well watered, near a good sized town, and either on the sea or a navigable river, or else on a good and much frequented road. Choose a place which has not often changed ownership, one which is sold unwillingly, that has buildings on it in good repair.”

2. A man should not buy a ranch with the intention of running it himself without having had some previous experience which would qualify him as a ranch manager.

3. He should have sufficient capital to make a substantial first payment, let us say, a fifth or a fourth down. In addition, he should have enough capital and credit combined to make the necessary improvements, to stock the place, and to operate it for at least a year, or until products may be sold. A man should have at least half the capital necessary to stock the ranch for if he has less and the livestock declines in value, he runs the risk of having to liquidate at the request of his creditors. Moreover, to secure a larger loan than half the value of the livestock he is likely

<sup>61</sup> "Roman Farm Management;" the Treatises of Cato and Varro translated by A Virginia Farmer; The Macmillan Company, New York City, 1913; quoting Cato "On Buying a Farm."

<sup>62</sup> Ibid., pp. 20-21.

to have to pay a higher rate of interest, for in that case the creditor is taking the lion's share of the risk and must be compensated for doing so.

After a man is by experience prepared and has accumulated a sufficient amount of capital he should go about the matter of selecting a ranch. Finding a suitable location, he should look into the matter of the price of land. If a man expects to pay for the ranch out of his income, he cannot afford to pay more than the productive value of the land, arrived at by capitalizing the net rent at the prevailing rate of interest, as has already been explained.

The extent to which a man may use credit in buying, equipping and stocking a ranch, depends to a considerable degree on the terms and conditions under which deferred payments must be made. If he must pay eight to ten per cent. interest on short-time credit, let us say, six months on breeding stock loans and five to ten years on land loans, he will do better to stay out of the ranch business or lease, unless he already possesses all the capital necessary.



## CHAPTER VIII

### THE CARRYING CAPACITY OF THE RANGES

#### THE TERM "CARRYING CAPACITY" DEFINED

The term *carrying capacity* is variously used by different individuals and carries different meanings in different sections of the country. As a rule it refers to the amount of forage produced on a given range in a given space of time. Ordinarily it is measured in terms of the number of animals utilizing it. Outside of Texas, particularly in the Northwest where the herds are grazed in the mountains in the summer and on the plains and in the valleys in the winter, the term carrying capacity refers to the number of livestock which may be grazed on a given area during the grazing season. It may be stated either in terms of acres per animal or animals per section of 640 acres. In Texas a tenant usually thinks of carrying capacity as meaning the number and kinds of livestock which a given ranch will presumably carry during the period of the lease. He is more likely to over-estimate and, therefore, overstock the ranch than not. The owner of a ranch in Texas usually thinks in terms of annual carrying capacity. On an exceptional year he may say that the carrying capacity is 80 heads of cattle per section, on an average year 40, and on a poor year 20, with corresponding variations in the number of sheep and goats which might be carried on the same range. Capacity thus refers either to the forage production of a single year or to normal forage production over a period of years. *The annual carrying capacity is usually defined to mean the power of the range to support certain numbers and proportions of livestock of the several types and classes which may be grazed on it during any particular year with best utilization of the vegetation and with least injury to the desirable forms of plant life.*

A perusal of the weather records shown in Chapter III will convince one of the great variation which may occur in the

annual carrying capacity of the ranges, good years and bad. If a man should stock his ranges to full capacity on the basis of the amount of grazing available on the best years he would be greatly over-stocked on succeeding average years and would undoubtedly meet with disaster on succeeding years of drouth. Although it is highly desirable for the ranchman to fully utilize the carrying capacity of his ranges each year, an attempt to do so often results disastrously. The safest course for the ranchman to pursue is for him to form a rather accurate estimate of the normal carrying capacity of his ranges and stock them accordingly. By this it is not meant that he should strike an average of the number of cattle, sheep and goats which he should carry regularly and adhere to it rigidly, good years and bad. It is naturally presumed that in order to best utilize his carrying capacity he will conservatively swell the numbers of livestock grazed on the best years and likewise contract them on dry years. The danger lies in the possibility of the ranchman increasing the numbers of his livestock by paying round prices when grass is plentiful and then running suddenly into a drouth and having to sell off his surplus at a sacrifice. It is only safe to increase the numbers of livestock in order to utilize surplus grass when the ranchman knows rather definitely that he can dispose of them by the time the surplus grass has been consumed. He, of course, can only determine the amount of surplus grass and, therefore, the number of surplus animals which he might carry for a limited time, when he has in mind a rather definite idea of the *normal* carrying capacity of his ranges. By this is meant *the power of the ranges normally to support certain numbers and proportions of livestock of the several types and classes, year in and year out, without injury to the desirable vegetation.*

Among cattlemen, the cow is the unit of measurement of carrying capacity. Bulls and other classes of cattle one year old and over are considered head for head as consuming the same amount of vegetation as a cow. Calves are not counted because it is considered that what they consume is counterbalanced by the yearlings consuming that much less than a cow. Although this method of estimating carrying capacity is rather useful to practical ranchmen, it is not sufficiently accurate for

scientific purposes. It is especially inadequate for use in sections practicing diversified grazing such as the Edwards Plateau. There is urgent need, therefore, for a more accurate method of measuring carrying capacity and of re-defining the term.

Fortunately, in animal nutrition there is a relatively accurate basis for defining carrying capacity and determining a unit for its measurement. It is said that the ruminants, such as cattle, sheep and goats, digest range forage with approximately equal efficiency and that age makes no appreciable difference.<sup>63</sup> In order, therefore, to determine the feed requirements of the different classes of range animals—cattle, sheep and goats—it is necessary to know the initial weights of the different classes of animals studied and the increases in weight during the grazing period.

In the Sutton County survey figures were obtained as to the types, ages, numbers and classes of the livestock run. Some weights and a large number of estimates were obtained from ranchmen as to the weights at stated ages. Doctor Fraps<sup>64</sup> estimates that the average productive value of the range forage in the Edwards Plateau is about 35 therms per 100 pounds of dry matter. Our estimates of the carrying capacity of the Sutton County ranges which follow are based on the data gathered by us, on Dr. Fraps' estimates of the productive value of the range forage and on Armsby's<sup>65</sup> tables as to therm requirements for maintenance and gain of the animals under consideration. It must be recognized, however, that all the different types and classes of range animals tramp out or otherwise destroy a certain amount of range vegetation, but not necessarily in direct proportion to the amount consumed. Since no data are available, however, upon this point it is disregarded in this connection.

The authors have selected the range mother cow, whose estimated average weight is 750 pounds, as the unit of measurement of carrying capacity, because of her importance on the

---

<sup>63</sup> For a discussion of effect of class, ages and breeds on digestive efficiency see Pages 52-53 of "Feeds and Feeding," by Henry and Morrison.

<sup>64</sup> Dr. G. S. Fraps, Chief, Division of Chemistry; State Chemist; Texas Agricultural Experiment Station, A. and M. College of Texas, College Station, Texas.

<sup>65</sup> "Nutrition of Farm Animals," by H. P. Armsby, The Macmillan, Company, New York City, 1917.

TABLE 30  
Nutrition Requirements of Different Types and Classes of Livestock

Type of Animal	Class	Average of Estimated Weights at end of Period (Pounds)	Estimated Increase in Weight During Period (Pounds)	Age at Time of Sale (Months)	Period of Growth and Maintenance	Pounds of Dry Matter Required (Fraps <sup>66</sup> Esti-mates) <sup>66</sup>	Per Cent. of Carrying Capacity Required Considering the Mother (Fraps <sup>66</sup> Ratio)
Cattle	Bulls	1200	0	72-120	1 year	6965	1.25
	Mother Cows	750	75	36-144	1 year	5591	1.00
	Dry Cows	750	0	72-144	1 year	5162	.92
	Calves	350	225	9	9 mos.	3260	.58
	Yearling Heifers	550	200	12-24	1 year	4854	.87
	Two-year-old Heifers	700	150	33	1 year	5800	1.04
	One-year-old Steers	600	250	21	1 year	5371	.96
	Two-year-old Steers	750	150	33	1 year	5934	1.06
	Three-year-old Steers	850	100	46	1 year	6360	1.14
	Sheep	Rams	125	0	36-72	1 year	949
Ewes		95	10	24-72	1 year	849	.15
Lambs		55	47	7	7 mos.	420	.08
Yearling Ewes		90	45	14	7 mos.	620	.11
Yearling Muttons		90	45	14	7 mos.	877	.11
Muttons		100	10	26	1 year	877	.16
Goats	Bucks	100	0	36-84	1 year	823	.15
	Does	80	8	36-84	1 year	747	.13
	Kids	40	34	7	7 mos.	294	.05
	Yearling Does	80	40	14	7 mos.	571	.10
	Mutton Wethers	85	45	14	7 mos.	654	.12 <sup>67</sup>

<sup>66</sup> Ratios computed by Dr. G. S. Fraps, Chief, Division of Chemistry, State Chemist; Texas Agricultural Experiment Station, Agricultural and Mechanical College of Texas, College Station, Texas.

<sup>67</sup> Sheep and goats may be converted into rattle equivalents by multiplying the number in each class by the corresponding ratio. For example: 100 ewes X .15 = 15 cattle equivalents; which is to say that 100 ewes consume as much range forage as 15 mother cows, and so forth.

range. The forage requirements of all other range animals are expressed in terms of percentages of this standard unit.

Table 30 shows the estimated average weights, periods of maintenance and growth for the different types and classes of livestock in Sutton County, the pounds of dry matter required according to Fraps' estimates, and the percentage of carrying capacity required, considering the mother cow as unity.

A carrying capacity unit may be formally defined, therefore, as *the amount of forage or dry matter required to maintain a 750-pound mother cow on the range for one year.*

The normal carrying capacity of a given range, therefore, may be defined as *the number of available carrying capacity units produced one year with another over a period of years covering at least one weather cycle.* The actual carrying capacity produced on any particular year may be estimated by keeping records as to the numbers, weights, types and classes of animals which may be run on a definite area.

The exact numbers, types and classes of livestock required to utilize the carrying capacity will vary from season to season, from range to range and in accordance with the weights and gains of the livestock. In the Plains, for example, greatest efficiency might be obtained when 70 per cent. of the carrying capacity units are utilized by cattle, 30 per cent. by sheep, and no goats, whereas in the rougher, brushier areas of the Edwards Plateau, greatest efficiency might be obtained when 30 per cent. of the carrying capacity units are utilized by cattle, 30 per cent. by sheep, and 40 per cent. by goats. At the Ranch Experiment Station, where the country is rolling and there is only a medium cover of brush, the Superintendent estimates that 44 per cent. of the carrying capacity units should be utilized by cattle, 37 per cent. by sheep, and 19 per cent. by goats.

As we proceed, it becomes obvious that carrying capacity is an economic as well as a grazing concept. As such it is concerned with the possibilities for ranch income. It is concerned not only with the numbers and pounds of product which may be obtained on a given range, but also with the quality and value of the produce and with the legitimate expenses of production. For example, a sheepman in one region may grow as much wool per unit of area and at the same expense as another sheepman

in another region, but owing to a variety of causes he may be unable to produce the same quality of wool and consequently unable to obtain as high a price. Moreover, different ranchmen may be able to produce products of similar quality, but at different expenses. A severe climate, for instance, may make it necessary for a ranchman to construct barns and sheds for his livestock, whereas in a mild climate artificial protection may be unnecessary. The value of carrying capacity, therefore, is measured by (1) the quality, quantity and variety of forage produced, (2) the market demands for the products, and (3) efficiency in production and marketing

Thus with an adequate knowledge of the carrying capacity of a ranch, a prospective buyer is in position to form a rather accurate judgment as to how much he can afford to pay for it. After buying such a ranch he is in better position to go to his banker or other credit agency and secure loans up to the full loan value of his property. These agencies at the present time do not as a rule know the full loan value of a ranch and, therefore, in order to play safe they make deductions to cover all kinds of risk such as accompany dry years. The owner is also able to form a more accurate judgment as to the proper size of ranch to maintain, how to equip it, how much to pay for this equipment and also the kind and quantity of labor which he as manager can afford to employ. Furthermore, he knows how to stock his ranch properly and make more dependable plans for the efficient and orderly marketing of his products.

Not alone the individual, but Society also profits from such knowledge. In the face of a declining meat and wool supply consumers as well as producers are benefited by every improvement in production. Moreover, more accurate estimates as to the kinds and amounts of meats, wool and mohair normally produced on the grazing ranges of the country are the basis for intelligent procedure in increasing the supply, reducing costs or improving the quality of ranch products.

## FACTORS AFFECTING CARRYING CAPACITY

*Climate*

The climate has much to do with the success or failure of the grazing business. In the mountain regions of the Northwest, the carrying capacity is cut short because it is limited to summer grazing, by the long, cold winters and the snow. Similarly in many of the lower elevations, particularly those of the Southwest, the carrying capacity is cut short because grazing is limited to fall, winter or spring months by the long, hot, dry summers. Climate also brings about great variations in carrying capacity from year to year. These variations from good years to bad are very erratic and present the ranchman with a number of his most perplexing problems of management. In a cold climate greater protection must be afforded to animals and more winter feeding resorted to than is necessary farther south. Consequently ranches in the Northwest are not, as a rule, as large as those in the Southwest. On the other hand, the cooler climates seem to be more favorable to animal development and less favorable to animal diseases and parasites than the warmer.

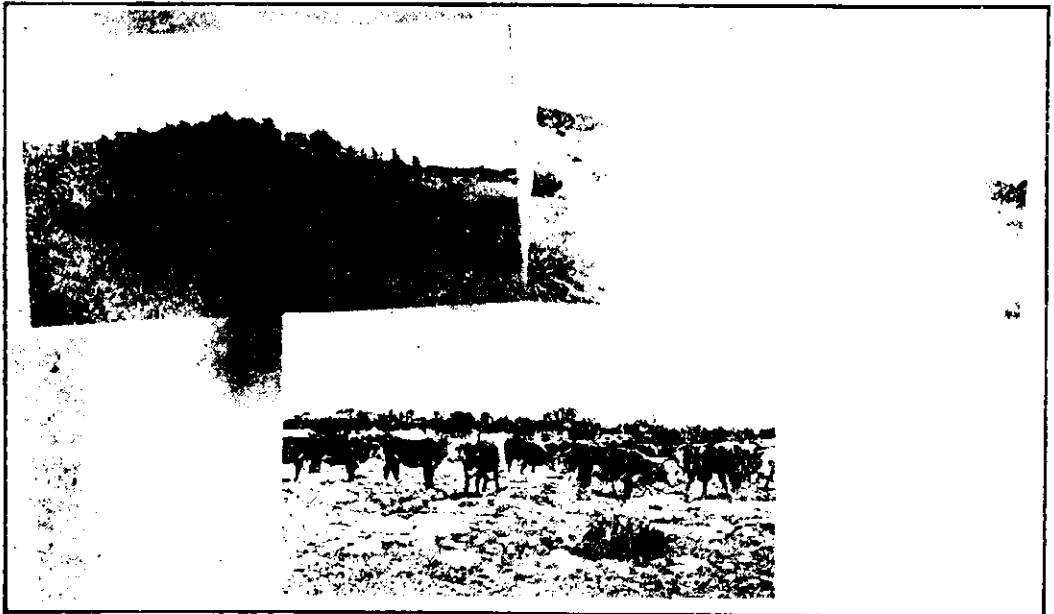
*Topography*

Topography, as one already may have inferred, has much to do with the climate. It also has much to do with the natural protection afforded livestock on the ranges. Animals must be protected from exposure to northers and blizzards. The losses are greater on level plains and least in broken country. Ranchmen always have made natural topographic protection one of the chief considerations in the selection of a site for a ranch. Topography also has much to do with the variety of vegetation. A range of broken topography normally affords a greater variety of plant life than a level plain. In Sutton County, the rough ranges provide the greatest variety although not necessarily the greatest quantity of grasses, weeds and browse; the undulating country next, and the level divides the least variety of all.

It becomes obvious, therefore, that topography directly or indirectly affects carrying capacity, depending upon the amount of protection afforded animals and its effect upon variety, quality and quantity of vegetation.

### *Percentage of Turf or Covering*

The carrying capacity of a range may be measured in terms of the percentage of turf or covering. If, for example, the land has a fifty per cent. cover it may be said to have a carrying capacity of about half that of similar land possessing a one hundred per cent. turf or cover. This statement, however, is only approximately true. Land with a fifty per cent. cover may have a carrying capacity somewhat greater or somewhat less than fifty per cent. A fifty per cent. cover on an already scant range might make grazing so expensive that the cattle would consume the greater part of their feed traveling around after it. On the other hand, if the uncovered fifty per cent. of the land consists of small loose surface rocks, the vegetation grown among them will draw on the soil under them for food and moisture and will, therefore, more nearly approximate a one hundred per cent. than a fifty per cent. cover. In the absence, however, of a better formula for estimating the number



**Figure 30.** There is a wide variation in the amount and variety of cover on the ranges.



of forage acres<sup>68</sup> it is well to presume that the grazing acreage on a given area compares directly with the per cent. of covering.

In buying or leasing a ranch, therefore, it should not be presumed that one having, say, fifty per cent. of the area covered with solid rock, alkali spots or desert sand, has a carrying capacity greater than fifty per cent. of that of a similar range with one hundred per cent. cover.

### *Effect of Variety and Quality of Cover Upon the Carrying Capacity*

The carrying capacity varies not only with the quantity, but also with the variety and quality of the cover. Some ranges produce a large quantity of vegetation having a rather low value for grazing purposes. Other sections, producing rather scant vegetation, may stand much higher in grazing value. In one section, the grazing may carry too small an amount of nutrients in proportion to the crude fiber; and most anywhere the carrying capacity is more nearly limited by the amount of nutrients in the forage than by the crude fiber.

In this connection variety has much to do with both quality and continuity of grazing. The animals are more certain of a "balanced ration" when the ranges are covered with a considerable variety of vegetation. They fare better if the range produces not only a variety of vegetation at a given time, but also a variety of plants coming in succession. Sutton County is an excellent example of an area normally producing a satisfactory variety of vegetation throughout the year. In addition to the mesquite and grama grasses which are available either green or dry, there is a succession of spring, summer, fall and winter weeds, and an abundance of live-oak, an evergreen, which provides browsing practically the year round.

In addition to the variety and quality of cover the time to utilize the vegetation must also be considered. There are certain types of vegetation which must be utilized when young and succulent. There are other types which may be used not only when green and fresh, but also after they have matured on the

<sup>68</sup> The forage acre is the equivalent of one acre with a solid cover. For example, on an area of one hundred acres, while the forage factor is estimated at 0.5, there are 50 units of forage produced. In other words, one hundred acres of land with 50 per cent. cover is the equivalent of 50 forage acres.

ground. Weeds as a rule must be grazed when young and tender, but mesquite and grama grasses will provide excellent grazing in the winter after they have cured on the ground. The greatest carrying capacity under such conditions is obtained where the owner manages to graze the livestock upon the weeds when they are in their succulent stage and to reserve some grass for later utilization.

### *Supplemental Feeding*

Possibly the most outstanding characteristic of ranching as distinguishing it from stock-farming is the fact that feeding if practiced at all is only supplemental to the grazing. When practiced on the ranch supplemental feeding is resorted to for

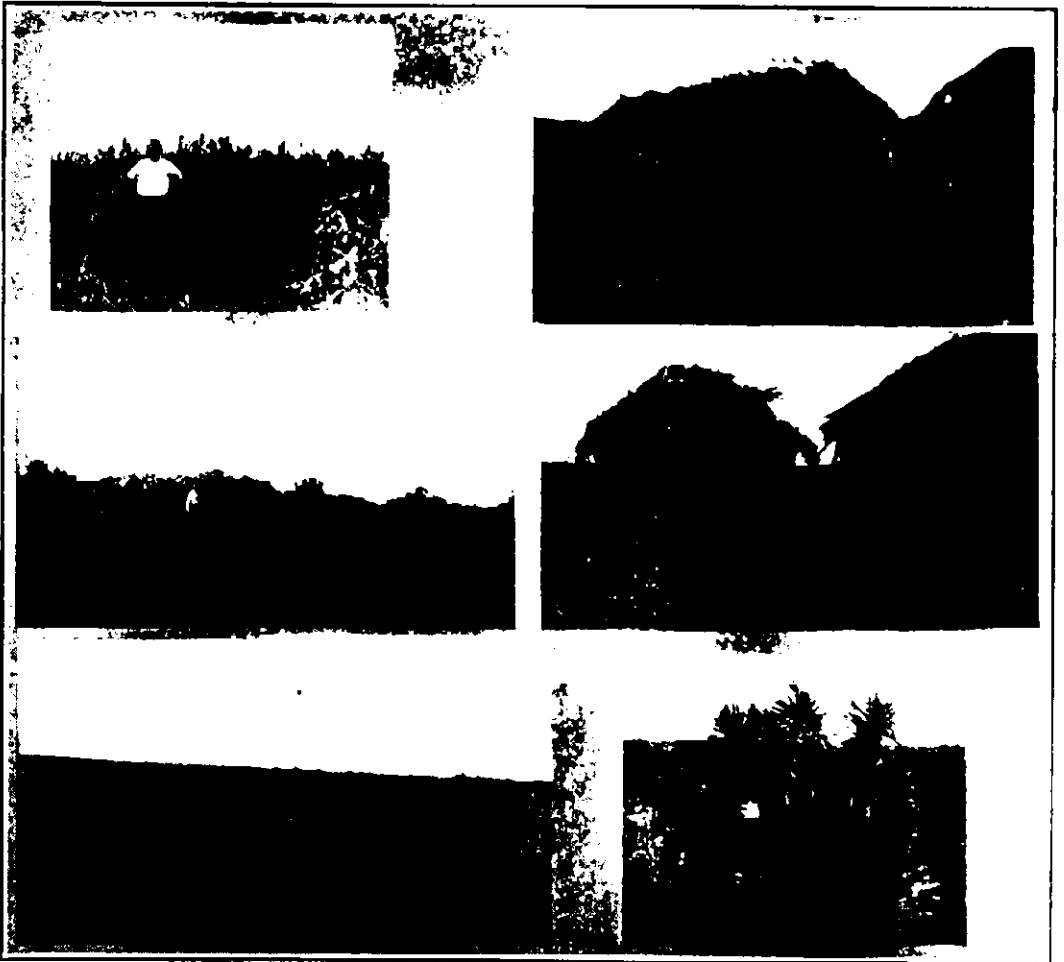


Figure 31. Feed reserves, properly used, increase the carrying capacity of the ranges. They may be cured on the range, they may be plants which store feed from year to year, or they may be grown in good years and stored.

maintaining the herds and flocks up to normal size during periods of a shortage in grazing. If not practiced, it is impossible for the ranchman to fully utilize all the carrying capacity of his ranch for without it he may be compelled to reduce the numbers of his flocks and herds at a sacrifice in order to conform to the carrying capacity of worst years. Supplemental feeding, therefore, increases the carrying capacity in greater proportion than the feed consumed would indicate.

It is practiced not only for the purpose of maintaining a high normal carrying capacity, but also for increasing efficiency in livestock raising. Weak or sick animals are separated from the herds and flocks and fed until they are again able to take care of themselves. Oftentimes it is necessary to feed mother cows for two or three weeks before and after calving in order to maintain a higher percentage of calf crop and to start the calves off in the spring with vigor.

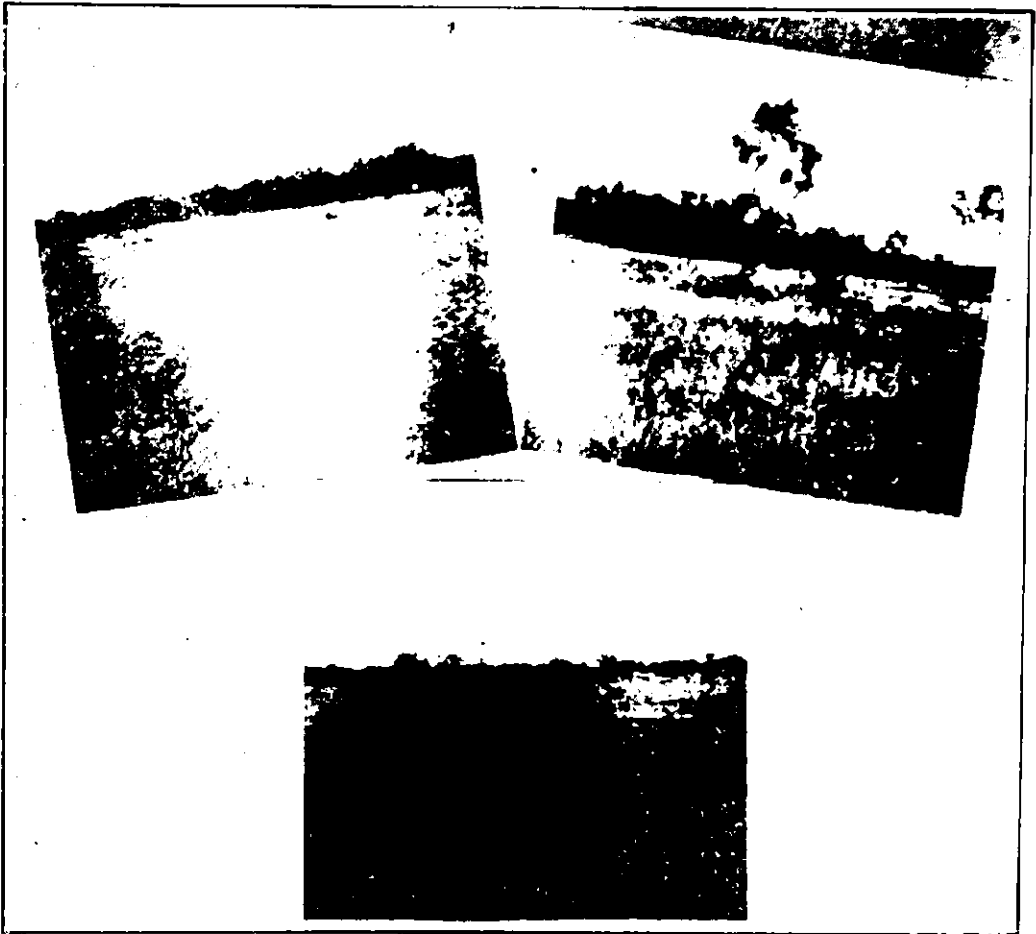
The expense of supplemental feeding in times of emergency is usually a profitable investment. It often means a difference between marketing canners and feeders; between a low percentage of calf, lamb or kid crop and a high one, or between gradually deteriorating herds and flocks and those in which the animals are maintained or improved in size and quality.

A word of caution, however, is not out of place just here. Too much should not be expected of supplemental feeding because of certain habits of range animals. Feeding once begun, the livestock comes to depend upon it and no longer rustles for provender on the range as before. Feeding should not be begun, therefore, so long as the livestock on the range is maintaining itself in good condition. When one begins to winter feed, it is advisable ordinarily to continue until the rains again freshen the range. Everything considered, it appears that the best results from supplemental range feeding come from separating the weak animals from the herds and flocks and feeding them until the grazing is again good and from "caking" mother cows, ewes and does from two to ten weeks during calving, lambing and kidding time depending upon the condition of the livestock and the ranges.

*Water Distribution*

The distribution of watering places on the ranges has a vital influence on the carrying capacity. Cattle as a rule should have water at least once a day. If the watering places, therefore, are too far apart, the outer edges of the ranges will be under-grazed while the area in the neighborhood of the watering places will be over-grazed and in times of drouth the grass may be completely tramped out.

The 97 Sutton County ranchmen visited in the course of this study varied in opinion somewhat as to the desired frequency of the watering places. Some thought that cattle should not have



**Figure 32.** The distribution of watering places has a vital influence on the carrying capacity of the range.

**Left:** Appearance of the range half a mile from the watering place on a ranch having too few wells.

**Bottom:** The range as it appears three miles from the watering place.

**Right:** Appearance of the range a mile and a half from watering place.

to go more than one mile for water; others one and one-half miles, and a few thought two or even three miles not too far. It is safe to say, however, that the carrying capacity will be decreased by virtue of over-grazing near the wells and under-grazing farther back when the cattle, sheep and goats have to travel a greater distance than one and one-half miles for water. The illustrations shown on page 174 bring out this point. The range would undoubtedly be more uniformly grazed if the wells were so distributed that the livestock did not have to go farther than one-half mile for water. There is a limit, however, to the number of watering places that can be profitably utilized on a ranch. A well, windmill and reservoir in Sutton County cost about \$2500.00 or more.

#### *The Amount and Distribution of Salt*

Both common experience and the investigation of agricultural experiment station workers, notably Babcock and Carlyle of the Wisconsin Station,<sup>69</sup> indicate that salt is essential to animal life. Commenting on this work, Henry and Morrison<sup>70</sup> say:

"In these trials dairy cows, well nourished otherwise, were given no common salt (sodium chloride) for long periods—more than a year in some instances. The following conclusions were reached: 'In every case the cows exhibited an abnormal appetite for salt after having been deprived of it for 2 or 3 weeks, but in no case did the health of the animal, as shown by the general appearance, the live weight or the yield of milk, appear to be affected until a much longer time had elapsed. This period of immunity varied with individual cows from less than a month to more than a year. There was finally reached a condition of low vitality in which a sudden and complete breakdown occurred. This stage was marked by loss of appetite, a generally haggard appearance, lusterless eyes, a rough coat, and a very rapid decline in both live weight and yield of milk.' If salt was supplied at this period recovery was rapid."

<sup>69</sup> S. M. Babcock and W. L. Carlyle, "The Addition of Salt to the Ration of Dairy Cows," written by S. M. Babcock, in 22nd Annual Report (1905) of the Wisconsin Agricultural Experiment Station, Madison, Wisconsin; pages 129-156.

<sup>70</sup> W. A. Henry and F. B. Morrison, "Feeds and Feeding," The Henry-Morrison Company, Madison, Wisconsin, 1915; page 67.

Salt improves digestion by inducing the secretion of digestive juices and also acts as a spice or codiment which whets the appetite and increases the palatability of many feeds.

As to the amount and frequency of salting, everything considered, it appears that livestock of all kinds should have continuous access to salt. Henry and Morrison<sup>71</sup> say: "Animals allowed free access to salt or supplied with it at frequent and regular intervals will consume only enough to meet the needs of the body."

The carrying capacity, therefore, appears to be affected negatively by an inadequacy of salt on the ranges and positively by inducing the animal to consume forage which it otherwise might not gather and also to digest and assimilate this feed with a higher degree of efficiency. In order that salt may be available to livestock at all times, it is necessary to give the salting places, like the watering places, appropriate distribution.

In the past when the ranges were open and watering places were few and far between, ranchmen often kept their livestock salt hungry and then used salt as a means of controlling and distributing the animals over the ranges. In more recent years, however, as the ranches have become smaller in size, cut up into pastures and fenced wolf-proof and watering places have become more numerous and better distributed, the original reasons for using salt as a means of control have in a large measure passed away. Salt is now used, therefore, primarily as a factor in animal nutrition. The greater number of Sutton County ranchmen now place their salt-licks near the watering places.

### *Diversified Ranching*

It is quite generally recognized that diversified farming is an improvement over a one-crop system. Likewise diversified ranching in the Edwards Plateau has its advantages over the raising of one type of livestock. There are, of course, some disadvantages, but when it comes to a consideration of diversified ranching in relation to the best utilization of the carrying

<sup>71</sup> W. A. Henry and F. B. Morrison, "Feeds and Feeding," The Henry-Morrison Company, Madison, Wisconsin, 1915; pages 66-67.

capacity of the ranges and of the ultimate value of the products of the ranch, the advantages outweigh the disadvantages. The advisability of diversification with livestock depends chiefly upon the kinds and varieties of vegetation on the ranges and this in turn depends largely upon the kinds of soil and the topography. In Sutton County the soil, topography and vegetation are such as to make ideal conditions for diversified ranching.

**AN APPROXIMATION OF THE PROPORTION OF THE POTENTIAL CARRYING CAPACITY UTILIZED BY CATTLE, SHEEP, AND GOATS ON THE THREE TYPES OF RANGES FOUND IN SUTTON COUNTY.**

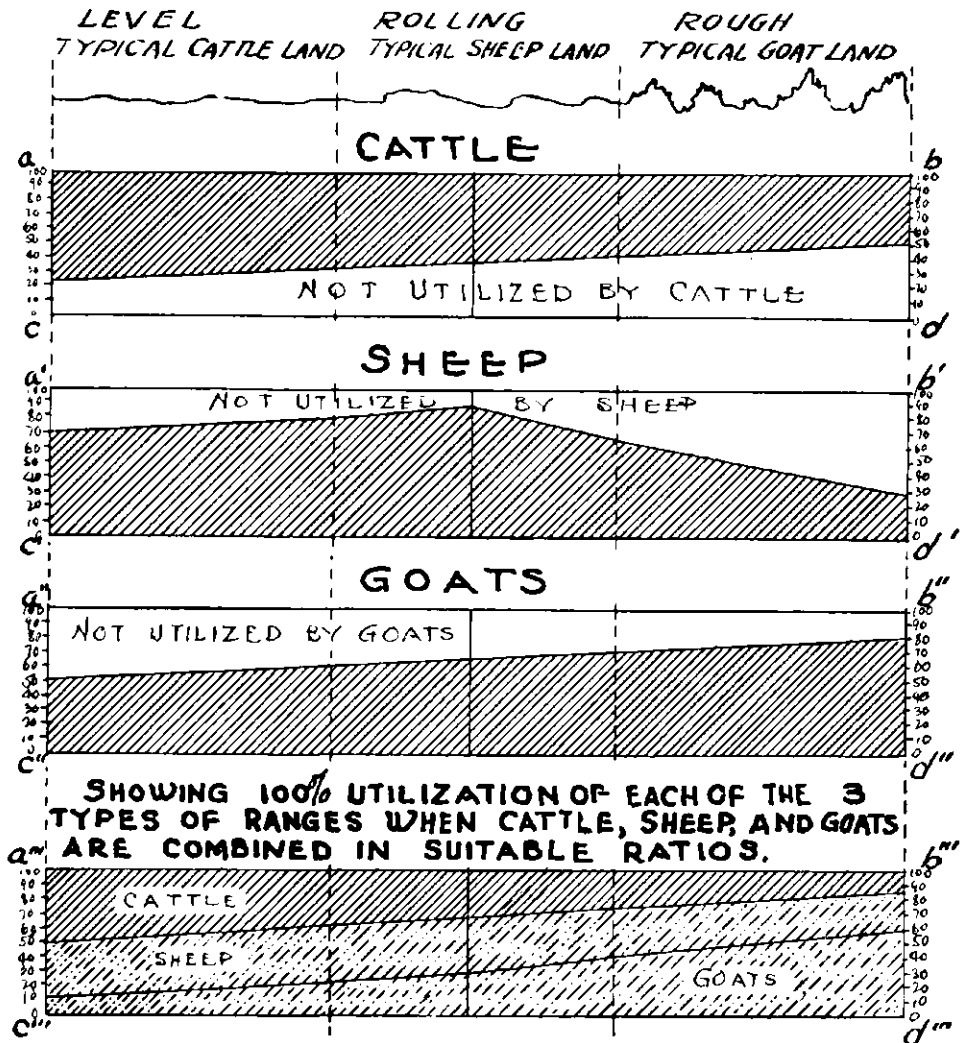


Figure 33.

The proportions in which cattle, sheep and goats may be combined on a Sutton County ranch will vary considerably from ranch to ranch, due to different combinations of level, rolling and rough lands found on the ranges.

Figure 33 illustrates the idea that a combination of cattle, sheep and goats results in a more efficient utilization of the carrying capacity of Sutton County ranges than the grazing of any one of the types of livestock mentioned. It also illustrates the idea that a normal combination of the three principal types of livestock grazed varies with changes in topography. In the explanation of the illustration it will be developed that the proportions of cattle, sheep and goats may be varied with certain limitations upon each type of topography.

If, in the illustration, the rectangle a b c d represents one hundred per cent. of the carrying capacity of a Sutton County ranch including level, rolling and rough land, then the shaded area is an approximation of that part of the total carrying capacity utilized by cattle and the unshaded part represents that part which they fail to utilize.

Similarly if rectangle a' b' c' d' represents one hundred per cent. of the area of a similar ranch upon which sheep alone are grazed, then the shaded portion is an approximation of the percentage of the total carrying capacity utilized by sheep and the unshaded portion represents the part which they fail to utilize.

If rectangle a'' b'' c'' d'' represents one hundred per cent. of the carrying capacity of a similar ranch grazed by goats alone, then the shaded portion is a rough approximation of the percentage of the total carrying capacity utilized by goats and the unshaded portion indicates that part which they fail to utilize.

Rectangle a''' b''' c''' d''' represents an approximate one hundred per cent. utilization of the total carrying capacity of a similar ranch when cattle, sheep and goats are grazed upon the different types of level, rolling and rough land in suitable proportions and in accordance with a desirable system of grazing.

In the illustration, three types of topography are shown, level, rolling and rough. This is done in order to illustrate the fact that the combination of the three types of livestock which



will best utilize the total carrying capacity of each of these types of range varies with the topography. Cattle, for example, generally utilize a higher percentage of the vegetation on the level land than on rolling, and more of the vegetation on the rolling than on the rough land. Sheep probably utilize a higher percentage of the vegetation on the rolling land than they do of the vegetation on the level or the rough land. Goats usually make the best utilization of the carrying capacity of the rough land, the next best of the rolling and the lowest utilization of the level lands.

These points may be explained by stating that in Sutton County level land is covered primarily with mesquite grass and weeds with here and there a little live-oak and mesquite brush. The rolling lands produce mesquite grass, weeds and an increasing percentage of live-oak and other brush while the rough lands have a rather sparse cover of grass and weeds and a great deal of live-oak and other brushes.

The cattle prefer the grass and some of the weeds such as the tallow weed. Sheep not only utilize the grass, but they also make a better utilization of the weed growth than either cattle or goats. Goats are apparently fond of most everything. They make a fairly good utilization of the grass and weeds, but seem to be fondest of browsing upon live-oak and other brush. Goats do better on the rough lands than any other type of livestock in part because they find their favorite feeds there and in part because they are both venturesome and agile. They get around on the rocks and places where other livestock would not go and when necessary stand upon their hind legs and browse as high as they can reach.

It follows that on the level land one may have considerable latitude in proportioning the number of cattle and sheep which he may run because cattle and sheep are rather strong competitors when it comes to utilizing the carrying capacity of the level ranges. All the goats that one needs to run on the level land is a sufficient number to hold the brush in check.

The rolling lands offer the greatest opportunity for variations of proportions of cattle, sheep and goats without materially affecting the carrying capacity. There should be enough cattle to utilize the taller grasses and some of the weeds.

There should be enough sheep to utilize the rest of the grass and weeds and there should be enough goats to hold the brush in check, but not enough to destroy it.

On the rough range there is a limited carrying capacity for cattle, but it is not essential that more than just a few heads be run. It is more important that some sheep be run in order to utilize the grasses and weeds. It is more important still to maintain a considerable proportion of goats on the range not only because they are naturally best adapted to the rough land, but also because there they ordinarily find the greatest amount of browsing.

The level lands are usually designated as cattle ranges. On these ranges the sheep and goats are used primarily to clean the pastures of those plants which the cattle do not utilize and thus to increase the utilization of the total carrying capacity. On cattle ranges sheep and goats may, therefore, be called by-products of the cattle business and are used to effect a higher utilization of the total carrying capacity.

The rolling lands are usually designated as sheep lands for the reason that sheep as a rule do best on this type of topography. When cattle and goats are grown on sheep ranges, they

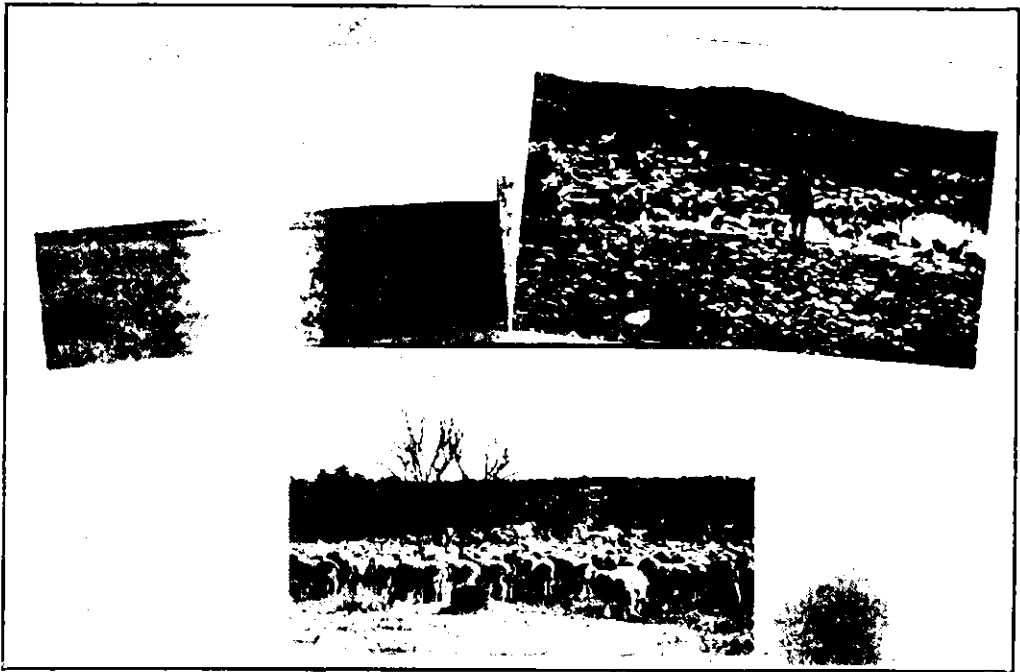


Figure 34. Level, rolling and rough grazing lands, and the types of livestock best adapted to each.

may be said to be by-products of the sheep business and are used to effect a higher utilization of the total carrying capacity.

The rough lands are usually designated as goat ranges for the reason that the goats are best adapted to this topography and also make the best utilization of the type of vegetation usually found on such ranges. On goat ranges cattle and sheep may be called by-products of the goat business and are used primarily to make the highest utilization of the carrying capacity of the goat ranges.

As has been indicated, there is some latitude as to the proportions of cattle, sheep and goats which may be grazed on a given range at a given time. Within the limitations set by the abilities of these three different types of livestock to make the best utilization of the range, one should be guided by the long-time relative market prices of cattle, sheep and wool, goats and mohair, in determining the exact proportions of the three types of animals to be grazed upon the ranges.

If over a considerable period of time cattle are high in price as compared to the market prices of sheep and goats, the emphasis should be placed on cattle raising, and sheep and goats should be grown as by-products in order to realize the greatest return in the utilization of the carrying capacity of the ranges.

If sheep and wool are relatively more profitable because high in price as compared with the market prices of cattle and goats, then sheep raising should be emphasized, and cattle and goats be grown as by-products in order to realize the fullest utilization of the ranges.

Likewise if goats and mohair are high in price as compared with the market prices of cattle and sheep, then goats should be emphasized and cattle and sheep should be grown as by-products in order to make the greatest utilization of the carrying capacity of the ranges.

It should be realized, of course, that a ranchman cannot change the proportions of cattle, sheep and goats very hurriedly at any time, but he should keep the idea of greatest net return in mind at all times and by a study of the relative market prices of the different types of livestock he should be able to gradually change the proportions in accordance with his own best interests.

Ranch lands are getting too high in price and successful ranching too difficult for a ranchman to grow cattle, sheep or goats purely from personal choice as in days gone by, regardless of the combinations of livestock required for a complete utilization of the carrying capacity of his ranges and of the relative market prices of these types of livestock.

### *The Ranch Layout*

Originally a ranch consisted largely of a headquarters near the watering place on public land. There was no opportunity to conserve vegetation for the reason that there were no fences and as a rule only one watering place. Losses occurred not only in terms of grass tramped down by the livestock, but also in terms of diseases which could not be controlled.

In the latter stages of the free-grass era and the early stages of the lease-hold, fences came into use not so much in connection with range conservation as to get rid of line-riding as a means of keeping one's own livestock on and the other fellow's off his land. At this stage, the ranch consisted of a headquarters and a line or outside fence. This was not much improvement over the more primitive type of ranch so far as the utilization of carrying capacity was concerned. In this stage, one man did not over-graze another one's range, but the ranchman proceeded to do this for himself. He was "riding a free horse" so he did not fail to ride it to death.

Not a great deal of improvement was made in the utilization of the ranges until after they came into private ownership. Gradually the owners have cut up their ranges into pastures and better distributed their watering and salting places. Pasture fences, of course, force animals onto ranges which otherwise might not be grazed at all.

There should be pastures enough to make possible the proper classification of the different types of livestock. The separation of the classes gives all animals an equal opportunity to graze and reduces injury to the cover due to trampling to a minimum. A ranchman with only one type of livestock, let us say cattle, needs at least three or four pastures and the stockman who runs two or three types of livestock, let us say cattle,

sheep and goats, will need correspondingly more pastures in order that he may properly classify the different types.

The size of the pasture has considerable influence on the carrying capacity. As a rule the larger the pasture, the less efficiently is the carrying capacity utilized. Usually watering places are not well distributed, causing over- and under-graz-

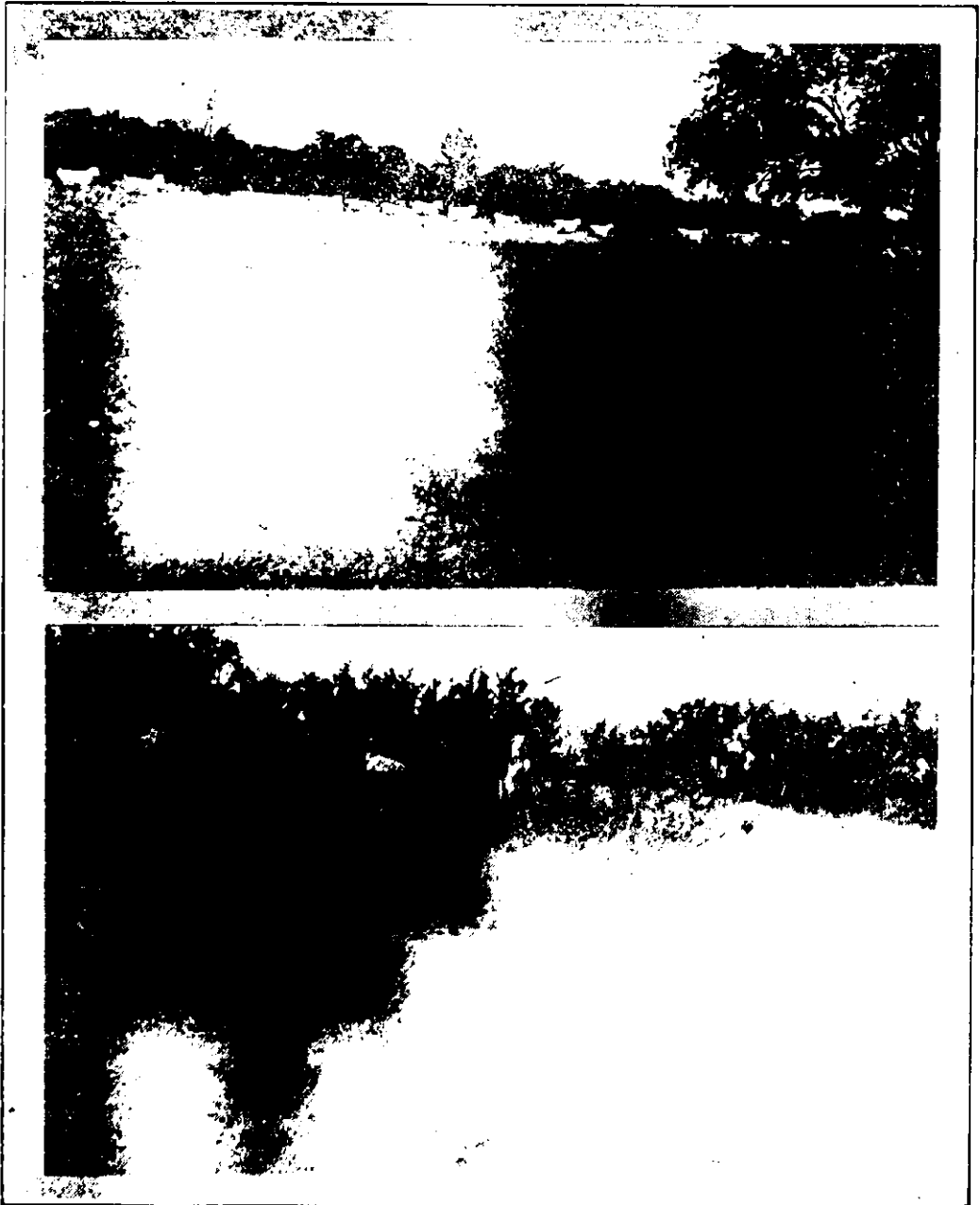


Figure 35. How sheep and goats go to graze.



Figure 36. Angora goats browsing, Ranch Experiment Station. "Goats browse with their heads up." Ranchmen say that sheep stand on their heads, and goats on their hind legs to graze and browse. This explains why sheep and goats added to cattle in proper ratios increase the carrying capacity of the ranges.

ing, and another tendency having the same effect is that of animals grazing in large herds and flocks rather than distributing themselves uniformly over the range. There is practically the same objection to this as to herding, namely, that all the animals do not have an equal opportunity to graze and the grass is injured by trampling.

There is, of course, an economic limit to the smallness of pastures. One, for example, cannot afford to divide his ranch up into a great number of small pastures, let us say, of from one-quarter to one-half section. Outside of a "trap" or two around headquarters, it is doubtful if one can afford pastures smaller than one or two sections.

The arrangement of pastures also influences carrying capacity. In the Edwards Plateau there are three general types of pasture arrangement. The first is a ranch having no apparent regularity as to shape or arrangement of pastures. These are due in all probability to a lack of planning. No particular reason can be ascribed for the present arrangement and as a rule if a man has it to do over he would plan better.

The second is an earlier type of arrangement in which the headquarters is located in the middle of the ranch and the fences radiate from the headquarters in all directions like the spokes of a wheel. This arrangement is advantageous inasmuch as all pastures reach up to headquarters. Its disadvantages lie in the fact that all pastures are irregular in shape and include acute angles, some of which are so inaccessible that they are not properly grazed.

The third and more modern type of pasture arrangement is for the fences to be laid out in squares or rectangles with only such deviation from these as topographic, forage and other local conditions may require for convenience in the handling of livestock and the best utilization of carrying capacity. Rectangular pastures with water and salt-licks properly distributed most nearly approximate the ideal. Some deviations are, however, often necessary.

The location of the headquarters with reference to the various pastures is also a matter of importance. It is obvious that the ranchman whose headquarters is located in a corner, at one side or at the end of his ranch, is at a great disadvantage in handling his livestock and in maintaining an optimum carrying capacity on his ranges. With the pastures properly arranged with reference to the headquarters, he reduces to a minimum the amount of herding and driving of livestock and otherwise increases his own efficiency as manager.

The character of the ranch fence is an important factor influencing carrying capacity. In the Edwards Plateau the wolf-proof fence which dispenses with herding gives the best results. Several advantages of this character of fence were enumerated near the end of Chapter IV. It enables the ranchman to control losses from diseases, wolves and coyotes, to classify his different types of livestock and it makes possible the utilization of every nook and corner of the range with the least amount of trampling.

### *Size of Ranches*

The small ranches were carrying the greatest number of livestock per section in 1920 because the operators were producing supplemental feeds and some were over-stocked. The greater carrying capacity of the medium sized ranches over the larger ones is explained by better water distribution, pasture arrangement and in general closer management. The carrying capacity of the big ranches is relatively low due as a rule to an unsatisfactory distribution of water, lack of proper layout, an inadequacy of fences, less supplemental feeding and in general slacker management. The percentage of death loss is greater and that of calves dropped and raised is smaller on the large ranches because on them it is impossible to give the livestock the care and attention that are usually given on the smaller ranches.

Table 31 shows the actual carrying capacity units utilized by cattle, sheep and goats in Sutton County, per group and per section.

### *The Grazing System*

The system of grazing has a fundamental influence on the carrying capacity of the range. The continuous grazing of livestock upon the same range, practiced by most of the one-section ranchmen, has proved very detrimental to carrying capacity. Their ranges as a rule are over-grazed and their livestock comes out of the winter in very poor condition. All their animals have the full run of the pasture. The year-round plan of grazing livestock on the same pasture neither makes provision



TABLE 31

Showing the total carrying capacity units utilized by cattle, sheep and goats in Sutton County, per group and per section

Groups of Ranches By Sizes	Number of Ranches Included	Number of sections	Carrying Capacity Units Utilized by all Cattle, Sheep and Goats		Carrying Capacity Units Utilized by Cattle		Carrying Capacity Units Utilized by Sheep		Carrying Capacity Units Utilized by Goats	
			Group	Section	Group	Section	Group	Section	Group	Section
<b>Total</b> .....	<b>97</b>	<b>1,497</b>	<b>105,113.21</b>	<b>70.22</b>	<b>57,782.44</b>	<b>38.6</b>	<b>34,644.11</b>	<b>23.14</b>	<b>12,686.66</b>	<b>8.48</b>
Under 1 section .....	1	1	25.63	25.63	5.45	5.45	20.18	20.18	0	0
1 and under 2 sections .....	10	10	824.86	82.49	259.10	25.91	105.75	10.57	460.01	46.00
2 and under 4 sections .....	5	11	983.03	89.37	521.90	47.45	319.14	29.01	141.99	12.91
4 and under 8 sections .....	25	138	10,364.25	75.10	3,740.26	27.10	4,555.45	33.01	2,068.54	14.99
8 and under 12 sections .....	19	182	12,697.99	69.77 <sup>72</sup>	5,784.00	31.78	4,903.85	26.94	2,010.14	11.04
12 and under 20 sections .....	18	256	18,997.74	74.21	8,794.52	34.35	8,173.89	31.92	2,029.33	7.93
20 and under 32 sections .....	9	227	15,010.26	66.12	8,468.36	37.31	4,868.82	21.44	1,673.08	7.37
32 sections and above .....	10	672	46,209.68	68.76	30,209.08	44.95	11,697.03	17.41	4,303.57	6.4

<sup>72</sup> In August, 1920, this group of ranches was relatively under-stocked with sheep. The owners had sold the larger percentage of their muttons.

for reserving pastures for winter grazing nor does it provide for the grazing of those areas which produce different kinds of grazing and browse at the time when they afford the greatest amount of forage.

Optimum carrying capacity requires that the ranches not only be sufficiently large that they may be divided into a number of pastures, but also that there be followed some plan of rotative grazing. By this is meant that the different pastures are not all grazed at the same time, but that each pasture is grazed in its proper season. A suitable system of rotative grazing assures the best utilization of carrying capacity and tends to maintain the proper vegetative cover.

Rotative grazing is based on the life cycle of the forage plants. Sampson<sup>73</sup> enumerates the requirements of plant growth as follows: "As it affects grazing management, the life cycle of forage plants may best be discussed under the following heads: (1) The production of foliage in the early growing season; (2) the production of flower stalks and seed crops; (3) the scattering and planting of seed; and (4) the establishment of seedling plants."<sup>74</sup>

Any system of grazing which does not comply with these requirements injures the existing range plants, cuts short the carrying capacity and tends to preclude the possibility of range improvement. The requirements of plant growth may be complied with in a practical way by resorting to deferred, rotative and diversified grazing.

By deferred grazing is meant the holding of livestock off the ranges until the principal plants have produced a seed crop. Then the animals are turned on to harvest the grasses, weeds and browse and incidentally to tramp seeds into the ground. The succeeding year the livestock is kept off the ground a sufficient time for the seeds planted to germinate and for seedling plants to become firmly established and produce a seed crop.

By rotative grazing is meant the grazing of livestock on different pastures at different times so as to best utilize the ranges in succession, make possible deferred grazing on certain

<sup>73</sup> Arthur W. Sampson. in "Range Improvement by Deferred and Rotation Grazing." Bulletin No. 34 of the United States Department of Agriculture, contribution from the Forest Service December 31, 1913; Government Printing Office, Washington, D. C., 1914.

<sup>74</sup> *Ibid.*, page 2.

pastures and to assure an adequacy of grazing for the different seasons. Cattle, for example, may be grazed on one pasture in the springtime, on another in the summer and fall and still another in winter and the order of use of the pastures may be changed so as to comply with the requirements of plant growth in succeeding years.

By diversified grazing is meant merely the grazing of different types of livestock, as for example, cattle, sheep and goats. These may be all run together in one pasture or they may be included in a system of diversified rotative grazing.

By diversified rotative grazing is meant rotative grazing into which different types and combinations of livestock, as for example cattle, sheep and goats, are grazed in orderly rotation and succession with a view to making the best of the range and at the same time meeting the requirements of plant growth.

In a country subject to variation in forage production from one year to another, the optimum carrying capacity is secured, other things being equal, by grazing those animals which permit the most rapid changes in number with the least loss or inconvenience. The primary characteristics of a class of animals adjustable to carrying capacity are their marketability and the ease with which they may be transferred to new ranges. Breeding stock offers the greatest obstacles to rapid readjustments. It is almost impossible to get mother animals or animals heavy with young out of a drouth-stricken area or to market them satisfactorily. Steers and mutton sheep and goats have the most stable market and can be gotten out of the country with the greatest facility.

The best method of stocking a range, therefore, would be to run no more breeding stock than can be carried with supplemental feeding during the worst years and arrange to consume the surplus forage in the good years by running steers and muttons. The men on small or medium sized ranches who produce feed reserves sufficient to carry their stock over bad years, may find it to their advantage to stock almost entirely with breeding stock. It is doubtful, however, if, under present conditions, Sutton County ranchmen should stock their ranges with more bulls and mother stock than enough to utilize fifty per cent. of the cattle carrying capacity.

*Managerial Skill*

The managerial skill of the ranchman is a big factor in maintaining optimum carrying capacity. The skillful manager readily detects any indications of under- or over-stocking and he also knows the number, types and classes of livestock which he may run on his various pastures without injury to the vegetation. He may be able to run more animals on his range than his neighbor runs because of better judgment as to how to graze his ranges.

*The Form of Tenure*

The statistics gathered in Sutton County show that the form of tenure has much to do with the carrying capacity of the range. The ranches having the greatest carrying capacity are those operated by the owners. The ranches having the least carrying capacity are those which are part owned and part leased. When all cattle, sheep and goats are reduced to the standard carrying capacity unit, the owned ranches in Sutton County are carrying the equivalent of 72.2 units per section, the leased ranches 67.3, and the part owned and part leased ranches 66.16.<sup>75</sup>

The owned ranches show a greater carrying capacity partly because they are better equipped with fences and water supplies and partly because the owners have taken greater care to see that their ranges are not injured by over-grazing. The smaller percentage of livestock run on the tenant ranches may be explained partly because of the lack of sufficient permanent improvements and partly because of over- and under-grazing. Where a ranch is leased for a term of, let us say, five years, the carrying capacity is conserved until toward the middle of the lease period. About the third year the tenant is tempted to begin over-stocking the range especially if he thinks he will not be able to lease the same range again. Ordinarily by the end of the fifth year the range has been so thoroughly over-grazed that the carrying capacity has been materially impaired.

---

<sup>75</sup> In August of 1920.

Some young men are increasing their herds and flocks and expect to lease larger ranches. They almost invariably over-graze the small ranch before leaving it. Thus where a ranch is leased continually there is a tendency for it to be reduced in normal carrying capacity because of the inclination of tenants to over-graze.

The part owned and part leased ranches are low in carrying capacity because of inadequate improvements and because the operators may have over-stocked in an attempt to increase their income to make land purchases. There are some noteworthy exceptions to these statements, but in the main they are true for Sutton County conditions.

### *Drouth*

The extent to which drouth affects carrying capacity depends upon its frequency, intensity and duration. Protracted drouth reduces the percentage of cover and probably affects the vigor of the remaining forage plants. For a year or two following a severe drouth the pastures are usually very weedy. The weeds tend to prevent normal recovery of the grasses. During this period an extra number of sheep should be run both to best utilize the carrying capacity and to hold the weeds in check while the grass is coming back.

### *Over-Grazing*

Over-grazing means over-stocking the range to the point of injuring or destroying the normal cover of desirable forage plants. The result is a decline in the carrying capacity and consequently in the volume of ranch products. Over-grazing may be due to over-stocking with a given type of livestock or with a combination of different types. On a ranch over-stocked with cattle, for example, the grasses are likely to be first over-grazed. On one over-stocked with sheep the weeds, and on one over-stocked with goats the browsing plants. A ranch over-stocked with cattle, sheep and goats is likely to be over-grazed with reference to all types of desirable vegetation.

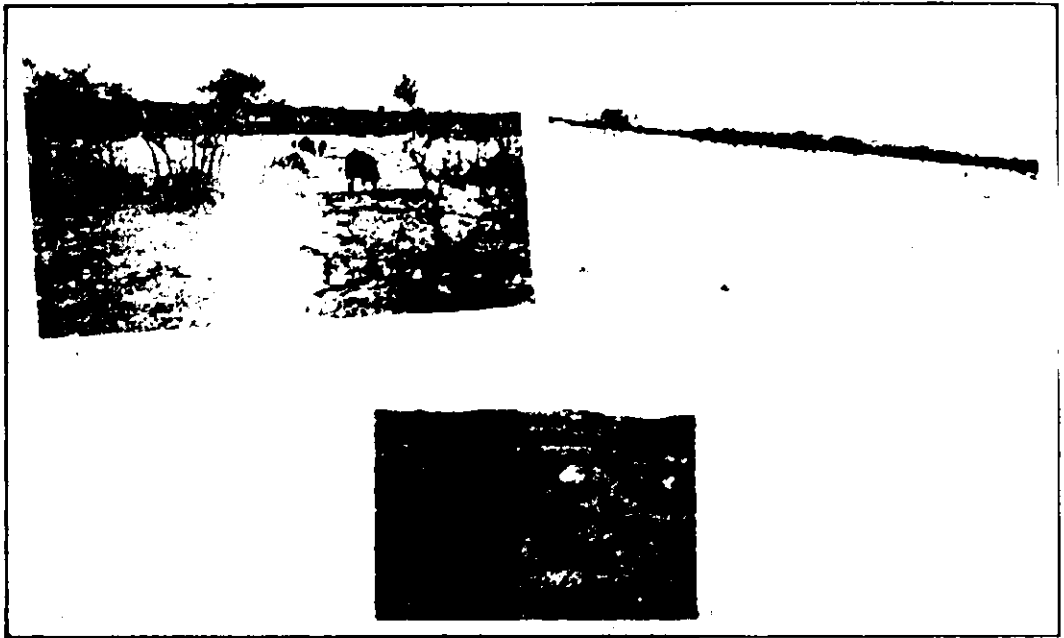


Figure 37. Showing the ill effects of over-grazing.

A type of over-grazing not included in the definition above is the over-grazing of certain plants which though palatable and nutritious are so scattered and so easily destroyed as to be of no economic consequence. It is better to stock to the limit of the normal carrying capacity, even though such plants are destroyed, than to fail to secure the most efficient utilization of the principal grazing plants.

### *Evidences of Over-Grazing*

There are many indications of over-grazing. The appearance on the range of plants unpalatable to all species of animals indicates that the more desirable plants are giving away. The destruction of perennial plants and the appearance of annual weeds and grasses are also indicative of over-grazing. If the ranchman who has had a good stand of mesquite grass finds that in certain spots in his pasture it is being displaced by needle grass, the chances are that his range is being over-grazed. Browse showing considerable stubby ends or in places killed out entirely is a sign of over-grazing. Where over-grazing has proceeded far enough, especially on the rolling lands, it mani-

feats itself in gullies and other forms of erosion. The ranchman in his efforts to fully utilize the carrying capacity of his ranges during good years stocks them above their normal carrying capacity and usually finds his ranges over-stocked during the succeeding normal and bad years. He thus defeats his own purpose. Instead of increasing his income, he gradually reduces it and even may bankrupt himself.

### *Under-Grazing*

Under-grazing is the counterpart of over-grazing. Though possibly not so noticeable, it may be observed on most ranches. Those ranches which are over-grazed by cattle, for example, are likely to be under-grazed by sheep and goats. The cattle crop too closely the vegetation of which they are fondest and leave untouched much of the other vegetation which sheep and goats would utilize. On many of the ranches there are under-grazed areas due to poorly distributed watering places. Areas may be found in certain large pastures which are practically

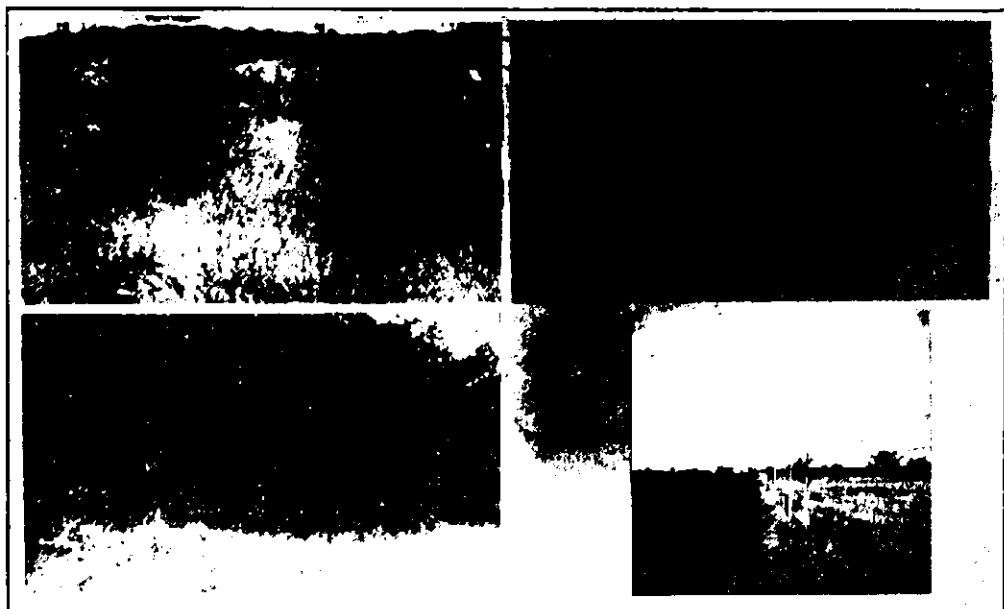


Figure 38. Examples of under-grazing. The first picture shows a pasture which has been over-grazed with sheep until needle grass has taken it. It may now be said to be under-grazed with cattle. The second picture shows a sheep pasture under-grazed. Note how sheep have eaten the grass in patches. The third picture illustrates under-grazing with goats. The brush is so dense that it crowds the grass out entirely. The fourth picture shows a pasture under-grazed with sheep, on which diversified grazing is practiced.

untouched by any type of animal simply because they are too far from water. Some pastures are producing weeds to the detriment of grass because cattle alone are grazed on them. If sheep were put on these pastures they would utilize the weeds and improve the stand of grass. Other pastures are overgrown with brush because there are no goats on them to hold the brush back. The owners, as they often stated, "Don't like to fool with goats." Most of the difficulties of under-grazing may be remedied by better water distribution, livestock diversification and rotative grazing.

### BUILDING UP DEPLETED RANGES

The method to be followed in building up depleted ranges depends upon the degree of depletion. Three different stages of depletion may be noted. The first is that in which the range has been over-grazed with a given type of livestock, let us say, cattle. This may be remedied by reducing the number of cattle and practicing deferred grazing until the vegetative cover affected by them has been brought back to a normal condition. Under-stocking with cattle, however, under these conditions, is not within itself a complete remedy for previous over-grazing. The number of cattle should, of course, be reduced, but more important still, sheep and goats should be grazed to hold back the weeds and brush and to give the grass an opportunity to spread and reseed itself.

The second stage noted is that in which over-grazing has been practiced to the point of thinning out the vegetative cover until there is only a scattering stand left of the important forage plants. The most successful method of rebuilding such a range in Sutton County is to practice deferred grazing along with livestock diversification. According to this method the different types of livestock are taken off the range until the plants upon which they graze have had sufficient time to mature seed. Then the livestock is turned in to graze the area, to tramp the seed into the ground and to glean the available forage. This insures a better distribution and a greater number of plants from the seed the following spring. Grazing does not injure the rootstocks after the seed has matured and it re-



duces fire hazards. The livestock is kept off the following spring until the young seedlings have become firmly established. After the carrying capacity of one pasture is thus improved, another may be taken up each succeeding year until an optimum carrying capacity is obtained in all the pastures.<sup>76</sup>

A third stage of depletion may be noted in which a large part of the vegetative cover has been destroyed. To depend upon under-stocking or rotative grazing alone would require several years to bring the range back to normal conditions and if seed is available considerable advantage might be gained by artificial reseeding. The seed may be scattered by hand or by dragging in with a brush drag. None of the ranges of Sutton County, however, is likely to be depleted to the extent that this treatment will be necessary.

Still another proposal is that of Professor Piper<sup>77</sup> and others of the United States Department of Agriculture to the effect that ranges might be improved by the introduction and propagation of new dry-land plants by means of seeds or the plants themselves from other regions or from foreign countries.<sup>78</sup>

For the present, however, the ranges of Sutton County may be brought up to optimum carrying capacity with the least expense and inconvenience by practicing livestock diversification, rotative and deferred grazing and otherwise by complying with the suggestions made in discussing the factors influencing carrying capacity.<sup>79</sup>

---

<sup>76</sup> For discussions of range improvement see "Increased Cattle Production on Southwestern Ranges," by James T. Jardine and L. C. Hurt; United States Department of Agriculture Bulletin No. 588; contribution from the Forest Service; November 15, 1917; Government Printing Office, Washington, D. C., 1917.

<sup>77</sup> C. V. Piper, Agrostologist in Charge, Office of Forage Crop Investigations, Bureau of Plant Industry, Department of Agriculture, Washington, D. C.

<sup>78</sup> An excellent example of the possibility of success in this direction may be found on the ranch of Mr. A. P. Borden, near Pierce, Texas. Some years ago Professor Piper induced Mr. Borden to plant fifty acres of his grazing land to Giant Bermuda grass, then a new introduction. Today Mr. Borden has more than two hundred acres in this grass which is producing many times the grazing which he formerly secured from the native vegetation or which he secures on similar areas from ordinary Bermuda grass. Mr. Borden's ranch is located in the humid section of the Gulf Coastal Plain. Although this grass thrives there it is unadapted to semi-arid sections.

<sup>79</sup> For a further discussion of range improvement see "Range Improvement by Deferred and Rotation Grazing," Bulletin No. 34 of the United States Department of Agriculture, contribution from the Forest Service, December 31, 1913; Government Printing Office, Washington, D. C., 1914.

TABLE 32

Showing area of ranches reporting livestock, number of cattle by classes, and total numbers of cattle per section of area reporting livestock

Groups of Ranches By Sizes	Number of Ranches Studied	Area in Sections of Ranches Reporting Livestock	Number of Cattle Reported										Total Num- ber per Section
			Herd Bulls	Mother Cows	Helpers	Steers			Calves	Total			
						1's	2's	3's					
Total .....	97	1,497	845 <sup>80</sup>	29,745	5,512	3,695	3,455	2,044	22,575	67,871	45		
Under 1 section .....	1	1	1	2	1	0	0	0	2	6	6		
1 and under 2 sections .....	10	10	6	151	36	5	0	0	116	314	31		
2 and under 4 sections .....	5	11	11	265	83	0	53	0	206	618	56		
4 and under 8 sections .....	25	138	61 <sup>81</sup>	2,052	475	42	192	0	1,688	4,510	33		
8 and under 12 sections .....	19	182	86	2,938	462	237	666	0	2,482	6,871	38		
12 and under 20 sections .....	18	256	156 <sup>82</sup>	4,303	1,264	939	130	60	3,634	10,486	41		
20 and under 32 sections .....	9	227	139 <sup>83</sup>	4,701	700	622	279	79	3,472	9,992	44		
32 sections and above .....	10	672	385	15,333	2,491	1,850	2,135	1,905	10,975	35,074	52		

80 An additional 101 held for sale.  
 81 An additional 4 held for sale.  
 82 An additional 28 held for sale.  
 83 An additional 69 held for sale.

THE CARRYING CAPACITY OF SUTTON COUNTY  
RANGES

It is impossible to get an accurate estimate of the carrying capacity of any grazing section by counting the number of animals being grazed at any particular time. Ranchmen buy and sell so that it is practically impossible to find a time in which every ranchman has the normal number of stock. Moreover, as has already been shown, the numbers of livestock on the range vary from year to year depending upon the condition of the ranges. The year of 1920, in which this study was made, was above the average, but there is no way to tell whether the ranges were over- or under-stocked. They were running in August of 1920 enough livestock to consume on the average 70.22 carrying capacity units per section, according to the method of measurement adopted in this study. The Ranch Experiment Station, which may be taken as representative of the average range in the county, has tentatively adopted 70 carrying capacity units per section as the basis for stocking its pastures. Whether or not this is the true normal, only time can tell.

Table 32 shows the number and distribution of cattle on Sutton County ranges classified according to the class of animals run and according to the size of ranches. It has already been pointed out that the proportions of cattle, sheep and goats on any given range depend on the topography, types of forage, per cent. of cover, and other factors. It is impossible, therefore, to judge the carrying capacity of the different sized ranches without taking into account the sum total of cattle, sheep and goats on each ranch.

Table 33 shows the number of sheep on the ranches, grouped according to class of animals run and according to the size of ranches. The unusually small number of sheep shown per section on some of the ranches does not necessarily indicate a low carrying capacity for the ranches because the ranchman may have either a range which is better adapted to either cattle or goats, or else he may be under-stocked on sheep.

TABLE 33

Showing area of ranches reporting livestock, number of sheep by classes, and total number of sheep per section of area reporting livestock

Groups of Ranches By Sizes	Number of Ranches Studied	Area in Sections of Ranches Report- ing Livestock	Number of Sheep Reported						Total	Total Num- ber Reported per Section
			Flock Rams	Flock Ewes	Mutton Wethers	Yearling Ewes	Spring Lambs			
Total .....	97	1,497	2,949 <sup>4</sup>	106,768	56,562	20,940	84,657	271,876	182	
Under 1 section .....	1	1	4	50	0	0	150	204	204	
1 and under 2 sections .....	10	10	11	280	78	238	269	876	88	
2 and under 4 sections .....	5	11	22	1,167	185	225	1,075	2,674	243	
4 and under 8 sections .....	25	138	303	15,068	7,197	746	12,627	35,941	260	
8 and under 12 sections .....	19	182	509	17,421	5,215	1,827	14,610	39,582	217	
12 and under 20 sections .....	18	256	700	21,282	15,883	7,993	18,026	63,884	250	
20 and under 32 sections .....	9	227	386	15,650	7,700	2,470	11,900	38,106	168	
32 sections and above .....	10	672	1,014	35,850	20,304	7,441	26,000	90,609	135	

<sup>4</sup> An additional 10 held for sale.

TABLE 34

Showing area of ranches reporting livestock, number of goats by classes, and total number of goats per section of area reporting livestock

Groups of Ranches By Sizes	Number of Ranches Studied	Area in Sections of Ranches Re- porting Livestock	Number of Goats Reported						Total	Total Num- ber per Section
			Bucks	Flock Does	Wethers	Yearling Does	Kids			
<b>Total</b> .....	97	1,497	892	45,043	33,016	8,831	36,340	124,122	82	
Under 1 section .....	1	1	0	0	0	0	0	0	0	
1 and under 2 sections .....	10	10	42	2,419	252	60	2,060	4,833	483	
2 and under 4 sections .....	5	11	20	793	230	0	166	1,174	107	
4 and under 8 sections .....	25	138	131 <sup>85</sup>	7,063	4,610	2,806	5,833	20,278	147	
8 and under 12 sections .....	19	182	128 <sup>86</sup>	5,759	6,871	1,425	4,905	19,288	106	
12 and under 20 sections .....	18	256	142	6,280	6,024	1,930	5,515	19,891	78	
20 and under 32 sections .....	9	227	131	6,010	5,129	75	4,983	16,328	72	
32 sections and above .....	10	672	298	16,719	9,900	2,535	12,878	42,330	63	

<sup>85</sup> An additional 35 held for sale.  
<sup>86</sup> An additional 200 held for sale.

Table 34 shows the number of goats on Sutton County ranges. There is a strong tendency for the goats to be grown on the small ranches in Sutton County. This is true because a great many of the small ranches are on the breaks of the Llano River which are primarily goat ranges. Moreover, the goats require more personal attention, especially during the kidding and shearing seasons, than is required by either sheep or cattle. The men on the small ranches are, therefore, in position to handle goats more economically than the men on large ranches.

The value of livestock varies with breeding, weight and quality. The following tables show the qualities of the breeding stock of cattle, sheep and goats. These tables indicate in a measure the possibilities of increasing the value of the carrying capacity of Sutton County ranges without increasing the number of animals grazed.

The Meat and Live Stock Digest <sup>87</sup> says:

"According to a statement just issued by the Bureau of Animal Industry, based upon a recent inquiry, purebred live stock has about 40 per cent. greater earning power than scrub stock. The statement reads in part:

'Based on utility alone (entirely apart from breeding or sales value) purebred live stock has an earning power from a third to one-half greater than scrub stock. The average superiority of purebreds over scrubs for all classes of farm animals is about 40 per cent.

'The superiority, based on utility, of purebred over common stock is evident from the following figures:

Class	Superior earning power Per cent.
Dairy cattle .....	47.8
Poultry .....	40.7
Swine .....	38.3
Sheep .....	37.8
Horses .....	37.2
Beef Cattle .....	36.8
Goats .....	36.8
Average for all classes (weighted) .....	40.4

'The relatively high percentage representing the earning power of wellbred dairy cattle and poultry over scrubs is ex-

<sup>87</sup> "Meat and Live Stock Digest," published monthly by the Institute of American Meat Packers, 509 South Wabash Avenue, Chicago, Illinois, issue of May, 1922; page 4.

plained doubtless by the greater facilities for keeping production records of these classes of live stock, thereby contributing to their improvement.

'Of the principal points in which purebreds excel other stock, the most prominent are: Superiority and uniformity in conformation and type, greater sale value, greater and more economical production, and earlier maturity.

'Surplus purebreds are readily salable at satisfactory prices in a majority of cases; but sales and prices depend largely on the quality of stock as shown by breeding and production records, also on the business ability of the breeder.

'With rare exceptions, purebred-sires users are satisfied with the quality of the offspring obtained, except that the desire is created in many cases to further improve the quality.

'The progeny of purebred sires has practically a 50 per cent. greater sale value than the progeny of non-purebreds.



Figure 39. Good sires increase profits if handled by capable men.

'Purebred sires of good quality are readily obtainable in the experience of three-fourths of the breeders reporting. The principal difficulties are: Paying the price and finding the desirable type, but there is practically unanimous agreement that the results justify the cost.

'The average increase in financial returns, from live stock raising, traceable to the use of purebred sires, is 48 per cent.

'Each breeder of purebred live stock influences, on an average, about nine other persons to raise superior animals.'"

Table 35 shows the number of registered cattle, sheep and goats in Sutton County at the time this study was made. While a very commendable start has been made toward the use of purebred sires, the table shows that there is considerable improvement to be made before it may be said that the ranges of Sutton County are carrying their full capacity from the standpoint of value. It is generally conceded by the ranchmen that the use of purebred sires requires no more labor than the use of grades. It is possible, therefore, to improve the herds and flocks of Sutton County very greatly without increasing the cost either of labor or equipment.

TABLE 35

## Inventory of Registered Breeding Animals in Sutton County

Groups of Ranches By Sizes	Number of Ranches Studied	Number of Registered Cattle		Number of Registered Goats		Number of Registered Sheep	
		Bulls	Mother Cows	Bucks	Does	Rams	Ewes
Total .....	97	609	276	618	2,103	1,856	662
Under 1 section .....	1	0	0	0	0	0	0
1 and under 2 sections .....	10	0	0	15	52	16	10
2 and under 4 sections .....	5	9	0	5	0	4	0
4 and under 8 sections .....	25	44	26	79	326	75	192
8 and under 12 sections.....	19	49	32	286	1,125	244	100
12 and under 20 sections ....	18	118	20	96	600	268	0
20 and under 32 sections ....	9	139	22	59	0	185	160
32 sections and above .....	10	250	176	78	0	1,064	200



The income from the sale of carrying capacity is affected by the death rate of the animals utilizing it. The herds and flocks which normally have the lowest death rate, all other things being equal, produce the greatest number of pounds of range products at least cost. Likewise it is affected by the percentage of calf crop. The herds and flocks which have the highest normal percentage of calf, lamb and kid crop produce a maximum product at least cost.

## TYPES AND CLASSES OF LIVESTOCK ON THE RANGES

### *The Normal Breeding Herd or Flock*

The normal breeding herd or flock is one that is composed of the requisite number of classes and individuals in each class to make it self perpetuating. The requisite classes are bulls and cows for breeding, and calves and yearling bulls, yearling heifers and two-year-old heifers, for replacing old bulls and old cows lost or sold. The unit, or minimum economic, herd is one that is large enough to make economic use of at least one animal in the class which requires the least number. In the cases in point this means one bull in the bull class, one ram in the ram class, and one Angora buck in the buck class.

For most ranges the unit herd of cattle is one bull, 25 cows and the following animals grown and kept for replacing old ones lost or sold: 6 calves, 1 young bull every two years, 5 yearling heifers and 4 two-year old heifers. The exact number required for replacements will depend upon the per cent. of death loss and the age at which old breeding stock is sold.

### *The Normal Range Herd or Flock*

The normal range herd or flock is composed of the required proportions of animals kept for breeding purposes by classes and *an additional number produced for sale*. The exact number in the minimum herd or flock will depend upon the death rate, the per cent. of calf, lamb or kid crop and the ages at which the increase and the old breeding stock are sold. Tables 36, 37 and 38 show the normal combination of such herds under the assumed conditions in Sutton County.

TABLE 36

Showing the distribution by classes, numbers and percentages, of the normal cattle population of Sutton, County, Texas, on the basis of 29,745 cows as found by the writers in August of 1920, presuming that the increase is sold as calves. Showing also the annual losses, replacement requirements, and the numbers for sale.

BASIS: One bull to 25 cows; calf crop dropped 72 per cent. of cows June 15; calf crop raised to yearlings 65 per cent. of cows June 15; annual losses on all other classes 5 per cent.; annual replacement requirements of live bulls and cows at end of year, 12½ per cent. Thus the total replacement requirement equals 5 per cent. of the bulls and cows lost plus an additional 12½ per cent. of the remaining 95 per cent. of live cows and bulls, due to selling of culls.

Class	Number in Class	Per cent. of whole Number	Annual Losses	Annual Replacements	Annual Sales
Total .....	63,407	100.00000	4,182	5,220	17,234
Bulls .....	1,190	1.87676	60	201	141
Cows { Mother ....	21,416	33.77545	1,071	3,614	2,543
{ Dry .....	8,329	13.13577	416	1,405	989
Calves dropped ...	21,416	33.77545	2,082	0	13,561
Yearling heifers for replacement .	5,561	8.77033	278	0	0
Yearling bulls for replacement .	212	.33435	11	0	0
Two-year-old heifers for replacement ....	5,283	8.33189	264	0	0

TABLE 37

Showing the distribution by classes, numbers and percentages, of the normal cattle population of Sutton County, Texas, on the basis of 29,745 cows as found by the writers in August of 1920, presuming that the increase is sold as yearlings. Showing also the annual losses, replacement requirements and the numbers for sale.

BASIS: One bull to 25 cows; calf crop dropped 72 per cent. of cows June 15; calf crop raised to yearlings 65 per cent. of cows June 15; annual losses on all other classes 5 per cent.; annual replacement requirements of live bulls and cows at end of year, 12½ per cent. Thus the total replacement requirement equals 5 per cent. of the bulls and cows lost plus an additional 12½ per cent. of the remaining 95 per cent. of live cows and bulls, due to selling of culls.

Class	Number in Class	Per cent. of Whole Number	Death Losses	Annual Replacements	Annual Sales
Total	76,968	100.00000	4,870	5,220	16,556
Bulls	1,190	1.54610	60	201	141
Cows {					
Mother	21,416	27.82455	1,071	3,614	2,543
Dry	8,329	10.82138	416	1,405	989
Calves Dropped	21,416	27.82455	2,092	0	0
Yearling Heifers {					
For replacement	5,561	7.22508	278	0	0
For sale	4,106	5.33468	205	0	3,901
Bulls for replacement	212	.27544	11	0	0
Steers for sale	9,455	12.28433	473	0	8,982
Two-year-old heifers for replacement	5,283	6.86389	264	0	0

TABLE 38

Showing the distribution by classes, numbers and percentages, of the normal cattle population of Sutton County, Texas, on the basis of 29,745 cows as found by the writers in August of 1920, presuming that the increase heifers are sold as yearlings and the increase steers are sold as 2's. Showing also the annual losses, replacement requirements, and the numbers for sale.

BASIS: One bull to 25 cows; calf crop dropped 72 per cent. of cows June 15; calf crop raised to yearlings 65 per cent. of cows June 15; annual losses on all other classes 5 per cent.; annual replacement requirements of live bulls and cows at end of year, 12½ per cent. Thus the total replacement requirement equals 5 per cent. of the bulls and cows lost plus an additional 12½ per cent. of the remaining 95 per cent. of live cows and bulls, due to selling of culls.

Class	Number in Class	Per cent. of Whole Number	Death Losses	Annual Replacements	Annual Sales
Total .....	85,950	100.00000	5,309	5,220	16,107
Bulls .....	1,190	1.38453	60	201	141
Cows { Mother ....	21,416	24.91681	1,071	3,614	2,543
{ Dry .....	8,329	9.69052	416	1,405	989
Calves dropped ...	21,416	24.91681	2,082	0	0
Heifers for replacement ....	5,561	6.47004	278	0	0
Heifers for sale .....	4,106	4.77720	205	0	3,901
Bulls for replacement ....	212	.24665	11	0	0
Yearling steers ...	9,455	11.00058	473	0	0
Two-yr.-old heifers for replacement .	5,283	6.14660	264	0	0
Two-yr.-old steers for sale .....	8,982	10.45026	449	0	8,533

### THE CARRYING CAPACITY REQUIREMENTS OF A NORMAL HERD OR FLOCK

The amount of carrying capacity required for the minimum normal herd or flock will depend upon the numbers in each

class composing it and upon the average weights and gains of the animals in each class. Tables 39, 40 and 41 show the number of carrying capacity units required, based upon the different ages at which the increase is sold.

TABLE 39

Showing the carrying capacity requirements of Sutton County cattle when 29,745 cows are kept and the increase is sold as calves. Showing in detail the number in each class on June 15 of each year, the average number run entire year, the per cent. of a carrying capacity unit required per animal of each class, the total carrying capacity units required by classes, the per cent. of the total carrying capacity units required by classes.

BASIS: One bull to 25 cows; calf crop dropped 72 per cent. of cows June 15; calf crop raised to yearlings 65 per cent. of cows June 15; annual losses on all other classes 5 per cent.; annual replacement requirements of live bulls and cows at end of year, 12½ per cent. Thus the total replacement requirement equals 5 per cent. of the bulls and cows lost plus an additional 12½ per cent. of the remaining 95 per cent. of live cows and bulls, due to selling of culls.

The carrying capacity estimates are based on the amounts of dry matter required for maintenance and growth of each class of cattle, according to Fraps.<sup>88</sup> These requirements will hereafter be referred to as "Fraps' ratios."

Class	No. in class at beginning of the year	Average No. run entire year	Fraps' ratio	Carrying capacity units required	Per cent. of carrying capacity	
Total .....	63,407	61,314		51,891	100.00000	
Bulls .....	1,190	1,160	1.25	1,450	2.79432	
Cows {	Mother .....	21,416	20,880	1.00	20,880	40.23819
	Dry .....	8,329	8,119	.92	7,470	14.39556
Calves dropped .....	21,416	20,375	.58	11,818	22.77466	
Yearling heifers for replacement .....	5,561	5,422	.87	4,717	9.09021	
Yearling bulls for replacement .....	212	207	.96	199	.38350	
Two-yr.-old heifers for replacement ..	5,283	5,151	1.04	5,257	10.32356	

88 Dr. G. S. Fraps, Chief, Division of Chemistry; State Chemist; Texas Agricultural Experiment Station, Agricultural and Mechanical College of Texas, College Station, Texas.

TABLE 40

Showing the carrying capacity requirements of Sutton County cattle when 29,745 cows are kept and the increase is sold as yearlings. Showing in detail the number in each class on June 15 of each year, the average number run entire year, the per cent. of a carrying capacity unit required per animal of each class, the total carrying capacity units required by classes, the per cent. of the total carrying capacity units required by classes.

BASIS: One bull to 25 cows; calf crop dropped 72 per cent. of cows June 15; calf crop raised to yearlings 65 per cent. of cows June 15; annual losses on all other classes 5 per cent.; annual replacement requirements of live bulls and cows at end of year, 12½ per cent. Thus the total replacement requirement equals 5 per cent. of the bulls and cows lost plus an additional 12½ per cent. of the remaining 95 per cent. of live cows and bulls, due to selling of culls.

The carrying capacity estimates are based on the amounts of dry matter required for maintenance and growth of each class of cattle according to Fraps.<sup>89</sup> These requirements will hereafter be referred to as "Fraps' ratios."

Class	No. in class at beginning of the year	Average No. run entire year	Fraps' ratio	Carrying capacity units required	Per cent. of carrying capacity
Total .....	76,968	74,537		64,224	100.00000
Bulls .....	1,190	1,160	1.25	1,450	2.25772
Cows { Mother .....	21,416	20,880	1.00	20,880	32.51121
{ Dry .....	8,329	8,119	.92	7,470	11.63117
Calves dropped ....	21,416	20,375	.58	11,818	18.40122
Yearling heifers for replacement .....	5,561	5,422	.87	4,717	7.34461
Yearling heifers for sale .....	4,106	4,004	.87	3,483	5.42321
Yearling bulls for ... replacement .....	212	207	.96	199	.30985
Yearling steers for sale .....	9,455	9,219	.96	8,850	13.77989
Two-yr.-old heifers for replacement ...	5,283	5,151	1.04	5,357	8.34112

<sup>89</sup> Dr. G. S. Fraps, Chief, Division of Chemistry; State Chemist; Texas Agricultural Experiment Station, Agricultural and Mechanical College of Texas, College Station, Texas.

TABLE 41

Showing the carrying capacity requirements of Sutton County cattle when 29,745 cows are kept and the increase heifers are sold as yearlings and steers sold as 2's. Showing in detail the number in each class on June 15 of each year, the average number run entire year, the per cent. of a carrying capacity unit required per animal of each class, the total carrying capacity units required by classes, the per cent. of the total carrying capacity units required by classes.

BASIS: One bull to 25 cows; calf crop dropped 72 per cent. of cows June 15; calf crop raised to yearlings 65 per cent. of cows June 15; annual losses on all other classes 5 per cent.; annual replacement requirements of live bulls and cows at end of year, 12½ per cent. Thus the total replacement requirement equals 5 per cent. of the bulls and cows lost plus an additional 12½ per cent. of the remaining 95 per cent. of live cows and bulls, due to selling of culls.

The carrying capacity estimates are based on the amounts of dry matter required for maintenance and growth of each class of cattle, according to Fraps.<sup>90</sup> These requirements will hereafter be referred to as "Fraps' ratios."

Class	No. in class at beginning of the year	Average No. run entire year	Fraps' ratio	Carrying capacity units required	Per cent. of carrying capacity	
Total .....	85,950	83,295		73,507	100.00000	
Bulls .....	1,190	1,160	1.25	1,450	1.97260	
Cows {	Mother .....	21,416	20,880	1.00	20,880	28.40546
	Dry .....	8,329	8,119	.92	7,470	10.16230
Calves dropped .....	21,416	20,375	.58	11,818	16.07738	
Yearling heifers for replacement .....	5,561	5,422	.87	4,717	6.41708	
Yearling heifers for sale .....	4,106	4,004	.87	3,483	4.73832	
Yearling bulls for replacement .....	212	207	.96	199	.27072	
Yearling steers for sale .....	9,455	9,219	.96	8,850	12.03967	
Two-year-old heifers for replacement ...	5,283	5,151	1.04	5,357	7.28774	
Two-year-old steers for sale .....	8,982	8,758	1.06	9,283	12.62873	

<sup>90</sup> Dr. G. S. Fraps, Chief, Division of Chemistry; State Chemist; Texas Agricultural Experiment Station, Agricultural and Mechanical College of Texas, College Station, Texas.

## SELLING CARRYING CAPACITY UNITS

Normally every ranchman has at his command a certain amount of carrying capacity on his ranges. His primary problem, therefore, is the sale of carrying capacity units. Ultimately they must be sold in the form of some type or class of livestock or livestock product. A landowner may sell or lease his range to another man, but he who secures it must devise ways and means of converting the available carrying capacity units into some form of animal product. Obviously he may do this in a number of ways. The very large number of possibilities for combining the types and classes makes the discovery of the *one perfect combination* rather difficult. A conclusion as to what is best under existing circumstances can be arrived at only by carefully considering one's own range in relation to the various points raised concerning carrying capacity in this chapter.

Tables 42, 43 and 44 show how the problem may be attacked and what is best for Sutton County ranchmen in the sale of carrying capacity under the conditions set forth. The relative amounts of carrying capacity ascribed to cattle, sheep and goats are those actually existing at the time this survey was made. These may or may not be the ultimate proportions for the county and, being averages, they certainly are not equally applicable to all the different ranches in the county.

A change in the premises set forth, however, does not materially change the results. If, for example, a ranchman should secure 90 per cent. calf crop dropped and 85 per cent. raised, and a death rate of 3 per cent. on cows and 2 per cent. on all other classes, it would probably still pay him to sell yearlings when prices are relatively the same as those used in these tables. A substitution of prevailing prices in these tables will enable the ranchman to figure accurately on this matter at any time. This point will become more obvious in succeeding tables. (See Tables 45 and 46).



TABLE 42

Showing how the 57,782 carrying capacity units devoted to cattle in 1920 would be utilized if cattlemen pursued the policy of selling the increase as calves. Showing in detail the per cent. of the total carrying capacity utilized per class of cattle, the number of carrying capacity units so utilized, Fraps' ratios, average number run entire year, numbers June 15, death losses, replacement requirements and numbers for sale.

BASIS: One bull to 25 cows; calf crop dropped 72 per cent. of cows June 15; calf crop raised to yearlings 65 per cent. of cows June 15; annual losses on all other classes 5 per cent.; annual replacement requirements of live bulls and cows at end of year, 12½ per cent. Thus the total replacement requirement equals 5 per cent. of the bulls and cows lost plus an additional 12½ per cent. of the remaining 95 per cent. of live bulls and cows, due to selling of culls.

Class	Per cent of carrying capacity used per class	No. carrying capacity units per class	Fraps' ratio	Average number run entire year	Number at beginning of year	Death losses	Replacement requirements	Numbers for sale
<b>Total</b> .....	100.00000	57,782		68,275	70,600	4,657	5,812	19,189
<b>Bulls</b> .....	2.79432	1,615	1.25	1,292	1,325	66	224	158
<b>Cows</b> { <b>Mother</b> .....	40.23819	23,250	1.00	23,250	23,846	1,192	4,023	2,831
{ <b>Dry</b> .....	14.39556	8,318	.92	9,041	9,273	464	1,565	1,101
<b>Calves dropped</b> .....	22.77466	13,160	.58	22,689	23,846	2,319		15,099
<b>Heifers for replacement</b>	9.09021	5,252	.87	6,037	6,192	310	0	0
<b>Bulls for replacement</b> ..	.38350	222	.96	231	236	12	0	0
<b>Two-year-old heifers for replacement</b> .....	10.32356	5,965	1.04	5,735	5,882	294	0	0

TABLE 43

Showing how the 57,782 carrying capacity units devoted to cattle in 1920 would be utilized if cattlemen pursued the policy of selling the increase as yearlings. Showing in detail the per cent. of the total carrying capacity utilized per class of cattle, the number of carrying capacity units so utilized, Fraps' ratios, average number run entire year, numbers June 15, death losses, replacement requirements and numbers for sale.

BASIS: One bull to 25 cows; calf crop dropped 72 per cent. of cows June 15; calf crop raised to yearlings 65 per cent. of cows June 15; annual losses on all other classes 5 per cent.; annual replacement requirements of live bulls and cows at end of year, 12½ per cent. Thus the total replacement requirement equals 5 per cent. of the bulls and cows lost plus an additional 12½ per cent. of the remaining 95 per cent. of live bulls and cows, due to selling culls.

Class	Per cent. of carrying capacity used per class	No. carrying capacity units per class	Fraps' ratio	Average number run entire year	Number at beginning of year	Death losses	Replacement requirements	Numbers for sale	
Total .....	100.00000	57,782		67,059	69,245	4,372	4,697	14,896	
Bulls .....	2.25772	1,304	1.25	1,043	1,070	54	181	127	
Cows {	Mother .....	32.51121	18,786	1.00	18,786	19,268	963	3,252	2,289
	Dry .....	11.63117	6,721	.92	7,305	7,492	374	1,264	890
Calves dropped .....	18.40122	10,632	.58	18,331	19,268	1,874	0	0	
Heifers for replacement	7.34461	4,244	.87	4,878	5,003	250	0	0	
Heifers for sale .....	5.42321	3,134	.87	3,602	3,694	185	0	3,509	
Bulls for replacement .	.30985	179	.96	186	191	10	0	0	
Steers for sale .....	13.77989	7,962	.96	8,294	8,506	425	0	8,081	
Two-year-old heifers for replacement ....	8.34112	4,820	1.04	4,634	4,753	237	0	0	

TABLE 44

Showing how the 57,782 carrying capacity units devoted to cattle in 1920 would be utilized if cattlemen pursued the policy of selling the increase heifers as yearlings and the increase steers as 2's. Showing in detail the per cent. of the total carrying capacity utilized per class of cattle, the number of carrying capacity units so utilized, Fraps' ratios, average number run entire year, numbers June 15, death losses, replacement requirements and numbers for sale.

**BASIS:** One bull to 25 cows; calf crop dropped 72 per cent. of cows June 15; calf crop raised to yearlings 65 per cent. of cows June 15; annual losses on all other classes 5 per cent.; annual replacement requirements of live bulls and cows at end of year, 12½ per cent. Thus the total replacement requirement equals 5 per cent. of the bulls and cows lost plus an additional 12½ per cent. of the remaining 95 per cent. of live bulls and cows, due to selling of culls.

Class	Per cent. of carrying capacity used per class	No. carrying capacity units per class	Fraps' ratio	Average number run entire year	Number at beginning of year	Death losses	Replacement requirements	Numbers for sale	
Total	100.00000	57,782		65,476	67,562	4,176	4,103	12,662	
Bulls	1.97260	1,140	1.25	912	935	47	158	111	
Cows	Mother	28.40546	16,413	1.00	16,413	16,834	842	2,841	1,999
	Dry	10.16230	5,872	.92	6,382	6,546	327	1,104	777
Calves dropped	16.07738	9,290	.58	16,017	16,834	1,638	0	0	
Heifers for replacement	6.41708	3,708	.87	4,262	4,371	219	0	0	
Yearling heifers for sale	4.73832	2,738	.87	3,147	3,228	161	0	3,067	
Yearling bulls for replacement	.27072	156	.96	163	167	9	0	0	
Yearling steers	12.03967	6,957	.96	7,247	7,433	372	0	0	
Two-year-old heifers for replacement	7.28774	4,211	1.04	4,049	4,153	208	0	0	
Two-year-old steers for sale	12.62873	7,297	1.06	6,884	7,061	353	0	6,708	

Tables 45 and 46 show the comparative advantages of selling the increase as calves, yearlings and 2's, and also the effect of increasing the calf crop and the death losses on the time of sale and the amount of the sale.

TABLE 45

Showing how the 57,782 carrying capacity units devoted to cattle in 1920 would be utilized if cattlemen pursued the policy of selling the increase at the ages listed below. Showing in detail the age at which this increase is sold, number for sale and the price per head, and the value.

BASIS: One bull to 25 cows; calf crop dropped 72 per cent. of cows June 15; calf crop raised to yearlings 65 per cent. of cows June 15; annual losses on all other classes 5 per cent.; annual replacement requirements of live bulls and cows at end of the year, 12½ per cent. Thus the total replacement requirement equals 5 per cent. of the bulls and cows lost plus an additional 12½ per cent. of the remaining 95 per cent. of live bulls and cows, due to selling of culls.

Class	When calves are sold			When yearlings are sold			When heifers are sold as yearlings and steers as 2's		
	Number	Price	Value	Number	Price	Value	Number	Price	Value
Total .....	19,189		\$820,069.20	14,896		\$947,454.10	12,661		\$915,982.75
Bulls .....	158	\$108.00	17,064.00	127	\$108.00	13,716.00	111	\$108.00	11,988.00
{ Mother .....	2,831	66.75	188,969.25	2,289	66.75	152,790.75	1,999	66.75	133,433.25
{ Dry .....	1,101	66.75	73,491.75	890	66.75	59,407.50	777	66.75	51,864.75
Calves dropped .....	15,099	35.80	540,544.20	0	0	0	0	0	0
Yearling heifers { For replacement .....	0	0	0	0	0	0	0	0	0
{ For sale .....	0	0	0	3,509	52.25	183,345.25	3,066	52.25	160,255.75
Yearling bulls for replacement .....	0	0	0	0	0	0	0	0	0
Yearling steers .....	0	0	0	8,081	66.60	538,194.60	0	0	0
Two-yr.-old heifers for replacement .....	0	0	0	0	0	0	0	0	0
Two-year-old steers for sale .....	0	0	0	0	0	0	6,708	83.25	558,441.00

TABLE 40

Showing how the 57,782 carrying capacity units devoted to cattle in 1920 would be utilized if cattlemen pursued the policy of selling the increase as listed below. Showing in detail the age at which this increase is sold, number for sale and the price per head, and the value.

BASIS: One bull to 25 cows; calf crop dropped 90 per cent. of cows June 15; calf crop raised to yearlings 85 per cent. of cows June 15; annual losses on cows 3 per cent. and on all other classes 2 per cent. Thus the total replacement requirement equals the 2 per cent. of the bulls and 3 per cent. of the cows lost and an additional 12½ per cent. of the remaining ones, due to the selling of culls.

Class	When calves are sold			When yearlings are sold			When two-yr.-olds are sold		
	1920			1920			1920		
	Number	Price	Value	Number	Price	Value	Number	Price	Value
Total .....	25,605		\$1,046,006.80	18,747		\$1,165,444.05	15,788		\$1,114,613.25
Bulls .....	154	\$108.00	16,632.00	114	\$108.00	12,312.00	97	\$108.00	10,476.00
Cows { Mother .....	3,438	66.75	229,486.50	2,560	66.75	170,880.00	2,179	66.75	145,448.25
Dry .....	382	66.75	25,498.50	285	66.75	19,023.75	242	66.75	16,153.50
Calves dropped .....	21,631	35.80	774,389.80	0	0	0	0	0	0
Yearling heifers { For replacement .....	0	0	0	0	0	0	0	0	0
For sale .....	0	0	0	6,150	52.25	321,337.50	5,232	52.25	273,372.00
Yearling bulls for replacement .....	0	0	0	0	0	0	0	0	0
Yearling steers for sale .....	0	0	0	9,638	66.60	641,890.80	0	0	0
Two-yr.-old heifers for replacement .....	0	0	0	0	0	0	0	0	0
Two-year-old steers for sale .....	0	0	0	0	0	0	8,038	83.25	669,163.50

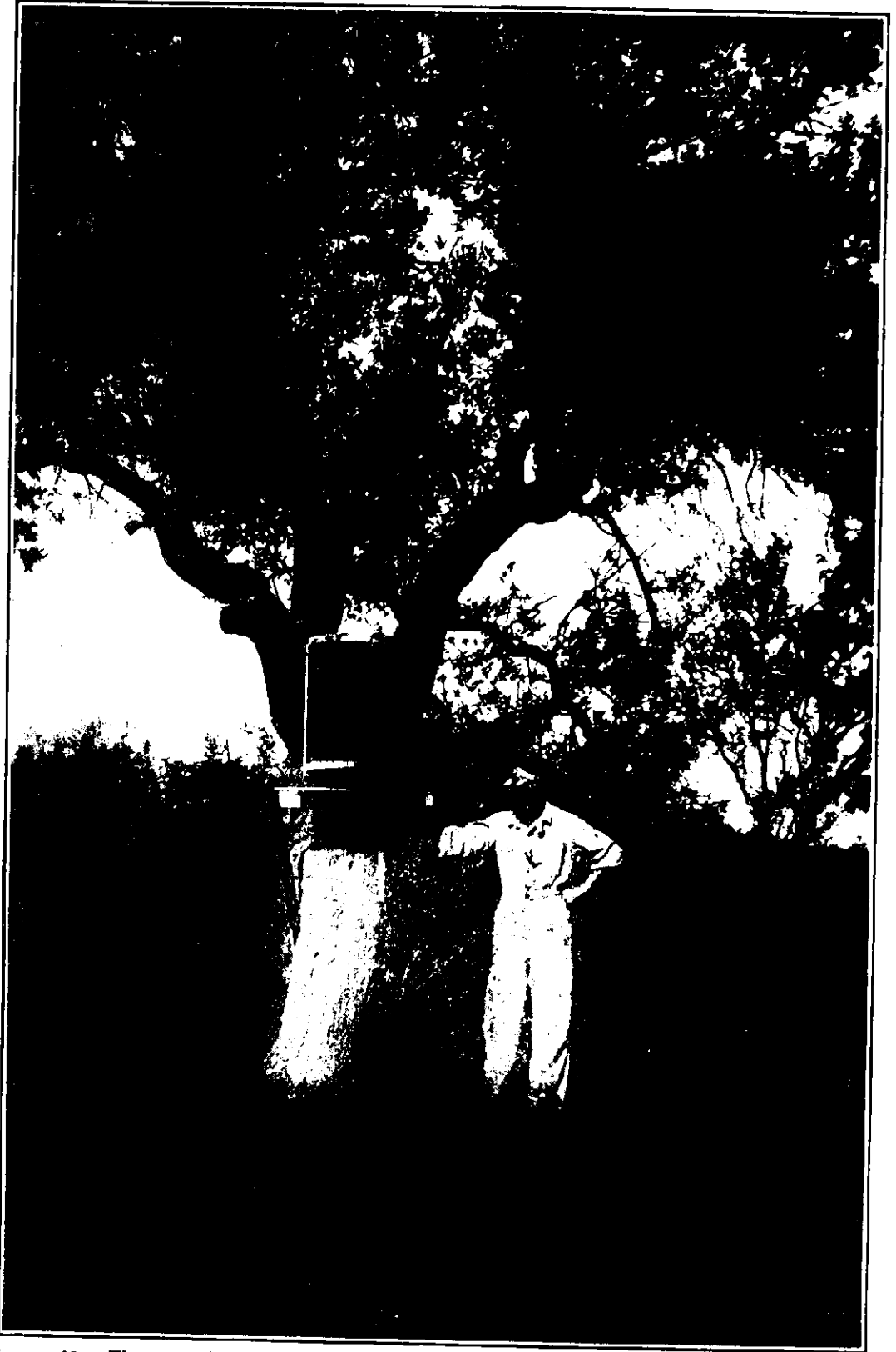


Figure 40. Fly-traps like this are used to combat the screw-worm in order to reduce death losses in livestock and the expenses of labor.

Profits are made in ranching not by the number of animals run on the range, but by the number and *quality* of the animals sold off. The ranchman who has such a high death rate among his stock and such a low per cent. of calf crop that it takes the larger part of the increase for replacements, can make no profit even though he stock his range to the limit. There are certain minimum expenses that must be met regardless of the calf crop or the death loss. These costs as a rule just about cover the income of the majority of ranchmen. It is the man who by superior management is able to secure a calf crop above and a death loss below the average that makes profits, all other things being equal. A comparison of returns for the 57,782 units of carrying capacity in Sutton County devoted to cattle, as shown in Table 45, is indicative of the importance of these factors.

TABLE 47

## "A"

Showing the numbers for sale, the value of sales in February of 1920 and of 1922, the depreciation and the percentage of depreciation 1920 to 1922, and the return per carrying capacity unit in 1920 and 1922 respectively. Indicating also the relative profitableness of selling the increase (1) as calves, (2) as yearlings, and (3) the heifer increase as yearlings and the steer increase as 2's.

BASIS: One bull to 25 cows; calf crop dropped 72 per cent. of the cows June 15; calf crop raised to yearlings 65 per cent. of cows June 15; annual losses on all other classes 5 per cent.; annual replacement requirements of live bulls and cows at end of year, 12½ per cent. Thus the total replacement requirement equals 5 per cent. of the bulls and cows lost plus an additional 12½ per cent. of the remaining 95 per cent. of live bulls and cows, due to selling of culls.

Age when increase is sold	Numbers for sale	Values of Sales		Depreciation 1920-1922	Percentage of depreciation	Return per unit of carrying capacity	
		1920	1922			1920	1922
(1) As calves . . . . .	19,189	\$820,069.20	\$395,923.50	\$424,145.70	51.72	\$14.19	\$6.85
(2) As yearlings . . . . .	14,896	947,454.10	457,516.50	489,937.60	51.71	16.40	7.92
(3) Heifers as 1's; steers as 2's . . . . .	12,661	915,982.75	418,282.50	497,700.25	54.33	15.85	7.24

## "B"

Showing the numbers for sale, the value of sales in February of 1920 and 1922, the depreciation and the percentage of depreciation 1920 to 1922, and the return per carrying capacity unit in 1920 and 1922 respectively. Indicating also the relative profitableness of selling the increase (1) as calves, (2) as yearlings, and (3) the heifer increase as yearlings and the steer increase as 2's.

BASIS: One bull to 25 cows; calf crop dropped 90 per cent. of cows June 15; calf crop raised to yearlings 85 per cent. of cows June 15; annual losses on cows 3 per cent. and on all other classes 2 per cent.; annual replacement requirements of live bulls and cows at the end of the year, 12½ per cent. Thus the total replacement requirement equals 2 per cent. of the bulls and 3 per cent. of the cows lost and an additional 12½ per cent. of the remaining live ones, due to selling of culls.

Age when increase is sold	Numbers for sale	Values of Sales		Depreciation 1920-1922	Percentage of Depreciation	Return per unit of carrying capacity	
		1920	1922			1920	1922
(1) As calves . . . . .	25,605	\$1,046,006.80	\$513,601.50	\$532,405.30	50.90	\$18.10	\$8.89
(2) As yearlings . . . . .	18,747	1,165,444.05	571,627.00	593,817.05	50.95	20.17	9.89
(3) Heifers as 1's; steers as 2's . . . . .	15,788	1,114,613.25	517,167.00	597,446.25	53.60	19.29	8.95



## TIME TO SELL SHEEP AND GOATS

Prices have not been determined and applied to the animals for sale as shown in the sheep and goat tables because of the absence of market quotations on range sheep. It is difficult to determine the price for them because of the several purposes for which they are normally kept, the true value of such sheep being determined by the market prices of wool and mutton and stocker sheep. Some ranchmen keep sheep primarily for wool while others keep them primarily for mutton, but most of them figure the income to be had from both the wool and the mutton. A ranchman who knows the approximate value of his sheep can readily determine whether to sell the increase of his flock as lambs or as yearling muttons, by applying the prices of these classes to the numbers indicated in the sheep table. An idea as to when to market goats can be arrived at in a similar manner.

TABLE 48

Showing how the 34,644 carrying capacity units devoted to sheep in 1920 would be utilized if ranchmen pursued the policy of selling the increase as lambs. Showing in detail the per cent. of the total carrying capacity utilized per class of sheep, and the number of carrying capacity units so utilized, Fraps' ratios, average number run entire year, number June 15, death losses, replacement requirements, and number for sale.

BASIS: One ram to 40 ewes; lamb crop dropped 95 per cent. of ewes June 15; lamb crop raised 80 per cent. of ewes June 15; annual losses on all other classes 6 per cent.; annual replacement requirements of live rams and ewes at end of year 16 2/3 per cent. Thus, the total replacement requirements equal 7 per cent. of rams and ewes lost plus an additional 16 2/3 per cent. of remaining 93 per cent. of live rams and ewes, due to culling.

Class	Per cent. of carrying capacity	Number of carrying capacity units	Per cent. of carrying capacity	Per cent. of carrying capacity	Average number of sheep	Number of sheep at year end	Deaths	Replacement requirements	Number for sale
Total	100.000000	84,644.00	.17	.15	297,220	314,115	24,786	32,586	100,453
Rams	1.67294	579.57	.17	.15	3,409	3,533	246	793	547
Ewes	59.03967	20,453.71	.15	.08	136,358	141,304	9,891	31,793	21,902
Lambs	14.27558	4,945.63	.08	.08	61,820	67,119	10,598	0	55,668
Ewes for replacement	14.27559	4,945.64	.11	.11	61,820	67,120	10,598	0	22,336
Rams for replacement	10.47484	3,628.90	.11	.11	32,990	34,186	2,393	0	0
	.26138	90.55			823	853	60	0	0

TABLE 49

Showing how the 34,644 carrying capacity units devoted to sheep in Sutton County in 1920 would be utilized if ranchmen pursued the policy of selling the increase as ewe lambs and yearling muttons. Showing in detail the per cent. of total carrying capacity utilized per class of sheep, the number of carrying capacity units so utilized, Fraps' ratios, average number run entire year, number June 15, death losses, replacement requirements, and number for sale.

**BASIS:** One ram to 40 ewes; lamb crop dropped 95 per cent. of ewes June 15; lamb crop raised 80 per cent. of ewes June 15; annual losses on all other classes 6 per cent.; annual replacement requirements of live rams and ewes at end of year 16 2/3 per cent. Thus, the total replacement requirements equal 7 per cent. of rams and ewes lost plus an additional 16 2/3 per cent. of remaining 93 per cent. of live rams and ewes, due to culling.

Class	Per cent. of carrying capacity used for class of animals	Number of carrying capacity units per class	Fraps' ratios	Average number run entire year	Number at beginning of year	Death losses	Replacement requirements	Number for sale
Total	100.00000	34,644.00		299,804	315,897	32,194	27,836	82,482
Rams	1.42916	495.12	.17	2,912	3,016	210	675	465
Ewes	50.43671	17,473.29	.15	116,489	120,714	8,450	27,161	18,711
Lambs	Rams	4,225.07	.08	52,813	57,339	9,053	0	0
	Ewes	4,225.07	.08	52,813	57,339	9,054	0	19,080
Ewes for replacement	8.94850	3,100.12	.11	28,183	29,205	2,044	0	0
Rams for replacement	.22329	77.36	.11	703	729	54	0	0
Muttons for sale	14.57098	5,047.97	.11	45,891	47,555	3,329	0	44,226

TABLE 50

Showing how the 12,686 carrying capacity units devoted to goats in Sutton County in 1920 would be utilized if ranchmen pursued the policy of selling the increase as kids. Showing in detail the per cent. of the total carrying capacity utilized per class of goats, and the number of carrying capacity units so utilized, Fraps' ratios, average number run entire year, number June 15, death losses, replacement requirements and number for sale.

BASIS: One buck to 40 does; kid crop dropped 95 per cent. of does June 15; kid crop raised 80 per cent. of does June 15; annual losses on all other classes 6 per cent.; annual replacement requirements of live bucks and does at end of year 16 2/3 per cent. Thus, the total replacement requirements equal 7 per cent. of bucks and does lost plus an additional 16 2/3 per cent. of remaining 93 per cent. of live bucks and does, due to culling.

Class	Per cent. of carrying capacity used per class of animals	Number of carrying capacity units per class	Fraps' ratios	Average number run entire year	Number at beginning of year	Death losses	Replacements	Number for sale
Total	100.00000	12,686.00		135,626	143,335	15,418	14,871	45,837
Bucks	1.83819	233.19	.15	1,555	1,611	113	363	250
Does	63.76205	8,088.85	.13	62,222	64,479	4,514	14,508	9,994
Kids	Bucks	1,410.47	.05	28,209	30,627	4,835	0	25,401
	Does	1,410.47	.05	28,209	30,628	4,836	0	10,192
Does for replacement	11.86642	1,505.37	.10	15,054	15,600	1,092	0	0
Bucks for replacement	.29678	37.65	.10	377	390	27	0	0

TABLE 51

Showing how the 12,686 carrying capacity units devoted to goats in Sutton County in 1920 would be utilized if ranchmen pursued the policy of selling the increase as yearlings. Showing in detail the per cent. of total carrying capacity utilized per class of goats, the number of carrying capacity units so utilized, Fraps' ratios, average number run entire year, number June 15, death loss, replacement requirements, and number for sale.

BASIS: One buck to 40 does; kid crop dropped 95 per cent. of does June 15; kid crop raised 80 per cent. of does June 15; annual losses on all other classes 6 per cent.; annual replacement requirements of live bucks and does at end of year 16 2/3 per cent. Thus, the total replacement requirements equal 7 per cent. of bucks and does lost plus an additional 16 2/3 per cent. of live bucks and does, due to culling.

Class	Per cent of carrying capacity used per class of animals	No. of carrying capacity units required	Fraps' ratios	Average number run entire year	Number at beginning of year	Death losses	Replacements	Number for sale
Total	100.00000	12,686.00		133,754	140,794	14,089	11,696	34,130
Bucks	1.44618	183.46	.15	1,223	1,267	88	283	195
Does	50.16415	6,363.82	.13	48,952	50,727	3,550	11,413	7,863
Kids	Bucks	1,109.67	.05	22,193	24,095	3,804	0	0
	Does	1,109.67	.05	22,193	24,095	3,805	0	0
Yearling does for replacement	9.33579	1,184.34	.10	11,843	12,272	859	0	0
Yearling does for sale	6.09898	773.72	.10	7,737	8,017	561	0	7,456
Yearling bucks for replacement	.23348	29.62	.10	296	304	21	0	0
Yearling muttons for sale	15.22703	1,931.70	.10	19,317	20,017	1,401	0	18,616

RELATIVE AMOUNTS OF CARRYING CAPACITY  
DEVOTED TO DIFFERENT TYPES AND  
CLASSES OF LIVESTOCK

Gross income is not to be depended upon as a guide as to what is the best type or combination of types to be run on the range. The mere fact that the ranchman may happen to find that sheep bring him the greatest gross returns is not conclusive evidence that he is making the best use of his range. A greater expense may be entailed in selling carrying capacity through sheep than in selling it through cattle or goats or a suitable combination of these animals on the range. Moreover it may be possible that the type which sells carrying capacity units at the lowest price should not be reduced in numbers in favor of another type that sells them at a higher price, because one may consume forage that would be very largely wasted by the other. Goats may not bring a high return from carrying capacity units at a given time, but if the cattle and sheep cannot consume the available browse, it is good business to run enough goats on the range to consume it.

The usual procedure in stocking a range is to put on as many heads of the type of livestock best suited to the range as necessary and then add other types and classes of animals until the desired utilization of all range forage is secured. The present proportions of livestock on the ranges of Sutton County are a result of this method. It is doubtless imperfect, but it should furnish the ranchman having average range conditions in Sutton County a tentative basis for stocking his range.

One should recognize the fact that each range has its peculiarities which must be weighed and the average proportions of types of livestock grazed must be modified to meet these peculiarities. The Ranch Experiment Station in Sutton County, for example, has estimated that 70 carrying capacity units per section is the normal product of its ranges. It plans to have cattle utilize 31 carrying capacity units, sheep 26 units and goats 13 units per section. The estimated number of carrying capacity units may be over or under the actual normal and the estimated numbers and proportions of cattle, sheep and goats may or may not affect their best utilization. If neces-

sary, changes will be made from time to time in the numbers and proportions of livestock according to the dictates of scientific investigations.

The utilization of all the carrying capacity devoted to cattle, sheep and goats in Sutton County in August of 1920 is shown in Table 52. Table 53 shows how the 105,112 units of carrying capacity devoted to cattle, sheep and goats would be utilized were the increase in cattle sold as yearling heifers and two-year-old steers; that in sheep sold as lambs, and that in goats sold as yearlings does and muttons.

TABLE 52

Showing how the 105,112 units of carrying capacity devoted to cattle, sheep and goats were utilized in August, 1920. Showing in detail the types and classes of animals run and the amount of carrying capacity used by types and classes.

Type	Class	Carrying capacity units used	Number of animals
<b>Total</b>		<b>105,112</b>	<b>454,205</b>
	<b>Subtotal</b>	<b>57,782</b>	<b>67,972</b>
Cattle	Bulls	1,183	946
	Cows	29,171	29,745
	Calves	13,094	22,575
	Heifers	4,795	5,575
	Yearling steers	3,547	3,695
	Two-year-old steers	3,662	3,445
	Three-year-old steers and over	2,330	2,044
	<b>Subtotal</b>	<b>34,644</b>	<b>271,876</b>
Sheep	Rams	503	2,949
	Ewes	16,015	106,768
	Lambs	6,773	84,657
	Yearling ewes	2,303	20,940
	Muttons	9,050	56,562
	<b>Subtotal</b>	<b>12,686</b>	<b>124,357</b>
Goats	Bucks	169	1,127
	Does	5,855	45,043
	Kids	1,817	36,340
	Yearling does	883	8,831
	Muttons	3,962	33,016

TABLE 53

Showing how the 105,112 units of carrying capacity devoted to cattle, sheep and goats are utilized if the increase of cattle is sold as yearling heifers and two-year-old steers; the increase of sheep sold as lambs, and the increase of goats sold as yearling muttons and does. Showing the types and classes of animals, the number of carrying capacity units used, and the average number of livestock by types and classes.

Type	Class	Carrying capacity units used by type and class	Average number live- stock run by type and class
<b>Total</b>		<b>105,112</b>	<b>496,450</b>
	<b>Subtotal</b>	<b>57,782</b>	<b>65,476</b>
Cattle	Bulls	1,140	912
	Mother cows	16,413	16,413
	Dry cows	5,872	6,382
	Calves	9,290	16,017
	Yearling heifers for replacement	3,708	4,262
	Yearling heifers for sale	2,738	3,147
	Bulls for replacement	156	163
	Yearling steers	6,957	7,247
	Two-yr.-old heifers for replacement	4,211	4,049
	Two-yr.-old steers for sale	7,297	6,884
	<b>Subtotal</b>	<b>34,644</b>	<b>297,220</b>
Sheep	Rams	580	3,409
	Ewes	20,454	136,358
	Lambs	9,891	123,640
	Yearling ewes for replacement	3,629	32,990
	Yearling rams for replacement	90	823
		<b>Subtotal</b>	<b>12,686</b>
Goats	Bucks	183	1,223
	Does	6,364	48,952
	Kids	2,219	44,386
	Yearling does for replacement	1,184	11,843
	Yearling does for sale	774	7,737
	Yearling bucks for replacement	30	296
	Yearling muttons for sale	1,932	19,317



The tendency is toward the sale of increase from the ranches at younger ages, due in part to the greater efficiency of younger animals in utilizing carrying capacity, and in part because of market demands.

It appears, however, that an attempt on the part of ranchmen to sell calves, lambs and kids, for example, would involve them in certain difficulties for which there is no adequate compensation. In order to sell calves, the ranchman must stock his ranges with bulls and mother cows to the extent of 57 1-2 per cent. of the cattle carrying capacity. An additional 20 per cent is required for heifers and bulls which must be grown for replacement purposes. If the replacement animals are considered as a part of the breeding herd, then it consumes about 77 1-2 per cent. of the total cattle carrying capacity. This would be all right but for the fact that a drouth may occur in which more than 50 per cent. of the carrying capacity is destroyed. In such a case the ranchman might be forced to sacrifice not only the calf crop, but also all the replacement animals and 10 per cent. or more of the mother cows. Obviously, therefore, a drouth is more disastrous to the ranchman making a business of selling his offspring as calves than to one selling his offspring as yearlings or as two's, unless he maintains an adequate feed reserve. The same is true of the practice of stocking with ewes and does with a view to selling lambs and kids.

If a ranchman undertakes, therefore, to make a regular practice of selling his increase as calves, lambs and kids, he must protect himself against the ravages of drouth by maintaining an adequate feed reserve and stocking his ranges conservatively enough that he has a safe margin of carrying capacity at all times.

For the time-being it would probably be a safer policy for those ranchmen who depend mainly on their ranges to carry their livestock the year round, to stock with breeding animals with a view to selling a part of the increase, let us say, half, as calves, lambs and kids, and hold over the remainder to be sold as yearlings or two's.

In any event, it will pay the ranchmen to stock their ranges more conservatively in the future than they have in the past.

CHAPTER IX  
PERMANENT IMPROVEMENTS  
DEFINITIONS

The materials at the disposal of the ranch operators are land, labor and capital. The land as has already been shown includes not only the soil, but everything that is physically inseparable from the land like climate and fertility. Capital on the ranch includes all instruments of production other than land



Figure 41. Scenes characteristic of open range cattle ranching in Texas.

- (1) The essentials of successful ranching—natural protection, nutritious grass, and plenty of water.
- (2) A Matador herd fording the Canadian River.
- (3) Saddling in the morning.
- (4) Branding crew at work.
- (5) Chuck-wagon. "Come and get it while it's hot; If you don't I'll throw it out and wash the pot."

(Photographs courtesy Professor R. H. Williams, Tucson, Arizona).

and labor. Fences, rock reservoirs, buildings and other capital items that are expected to last indefinitely and are more or less attached to the land are designated as permanent improvement capital in the following discussion. All other forms of production goods such as machinery, implements, tools, livestock and operating expenses are designated as movable capital.

The ranch business has been conducted with less permanent improvements per acre than any other type of gainful occupation except hunting and trapping. Under the most primitive conditions, there were virtually no permanent improvements. Grazing was practiced only near streams, springs or lakes. No permanent headquarters were maintained.

#### FENCE BUILDING FOR PURPOSES OF EXCLUSION

The first permanent improvements were made at the stage of development in which men began to show marks of possession and to provide for more efficient use of their lands. The improvements consisted of crude shacks, frequently half dugouts, and crude corrals, often pens made of pickets or poles.

The next stage in the development of permanent improvements for ranching purposes was the building of line or drift fences. These fences also marked the second step toward the development of private property in land. In the eyes of the "tenderfoot," these fences often started from nowhere and went miles and miles and ended like they started. To the ranchman, however, they marked a decided advance in the management of the range.

The stream of population moving westward soon questioned the right of individual ranchmen to the exclusive use of the unfenced or partly fenced ranges. The possessors of the ranges saw that to retain their ranges they must erect some visible mark of possession. The result was a very cheaply constructed outside fence. These fences were designed to serve two primary purposes, either one of which might be the more important, depending upon the circumstances. Line fences were built to exclude drifters, prospective settlers and others from a man's range. They were also built to lessen the number of line riders required on the cattle ranges.

Outside fences were improved from time to time as the land increased in value and the grass decreased in supply. Some cross-fences were built during these developments, but as a rule fences were looked upon as necessary though rather unproductive investments.

### PERIOD OF FENCE BUILDING FOR BETTER RANCH MANAGEMENT

The building of fences has in more recent times come to be looked upon as an investment that pays dividends. The developments in ranch organization and ranch layouts in Sutton County have meant the multiplication of enclosures beyond the imagination of the former open range ranchmen. The single pen corral has grown into a group of pens designed to aid in classifying and handling the livestock. The usefulness of small "traps" for horses, sick animals or those which for any reason need special care has been recognized for some years past. The carrying capacity of the ranges may be greatly increased and the livestock much more efficiently handled by a more scientific organization of the grazing area. Gradually the ranches are being cut up into pastures of suitable size.

The elaborate fence building program for strictly utility purposes has been of comparatively recent origin in Sutton County. The first fence designated as "wolf-proof" was built about 1910. From that time forward the building of wolf-proof fence has proceeded rapidly. At the present time there are over sixteen hundred miles of wolf-proof fence on the 97 ranches studied. This is enough fence to build over fifty lines across the country. If it were built in a straight line, it would extend from Texas to Chicago and half way back. Of this fence 828 miles are in outside, while 861 miles are in inside fence.

In addition to the wolf-proof fence, the 97 ranchmen have 260 miles of barbed wire fence. One hundred and twelve miles of these fences are outside fence. The strictly barbed wire fences are, however, rapidly disappearing. At least 50 miles of outside barbed wire fences are now in process of being removed.

TABLE 54

Showing total number of miles of fence, number of miles of outside and inside fences, grouped according to the kind of fence and the size of ranches

Groups of Ranches By Sizes	Number of Ranches Studied	Number of Miles of All Fences					
		All Fences		Outside Fences		Inside Fences	
		Total	Woven	Barbed	Woven	Barbed	Barbed
Total . . . . .	97 <sup>91</sup>	1,949½	828¼	112¾	861	147½	
Under 1 section . . . . .	1	4	1	2	1	0	
1 and under 2 sections . . . . .	10 <sup>92</sup>	27½	13	7¼	4¾	2½	
2 and under 4 sections . . . . .	5	28½	16	3½	5½	3½	
4 and under 8 sections . . . . .	25	254¾	113	32½	75¼	34	
8 and under 12 sections . . . . .	19	273½	131½	14	108½	19½	
12 and under 20 sections . . . . .	18	285¼	138¼	4	129	14	
20 and under 32 sections . . . . .	9	284	120	5½	143	15½	
32 sections and above . . . . .	10	792	295½	44	394	58½	

91 One ranch operator, owning 640 acres, makes no report on fences.

92 Ibid.

On the 97 ranches studied in Sutton County there are 1949 miles of fences of all kinds. At the present time, there are more miles of inside fence than outside fence.

Table 54 shows the number of miles of fence in Sutton County, the number of miles of inside and outside fences, grouped according to the size of ranches and the kind of fence.

### FENCE CONSTRUCTION

Fences are the most important and the most expensive of all permanent improvements on the range. The bulk of the wolf-proof fence consists of 51-inch woven wire with 6- to 12-inch stays with from two to three barbed wires above and one below. The barbed wires are intended to prevent the wolves from scratching under or climbing over the woven wire. The posts are extra long, seven to seven and one-half feet, well set and fairly close together, 20 to 30 feet, with wood stays between posts. In fact the construction of the wolf-proof fence has become more or less a profession in this country and the work of building it is often contracted to professional or semi-professional building crews.

Table 55 shows the outside woven wire fence classified by height of wire, grouped according to the size of ranches.

TABLE 55

Showing Number of Operators Reporting Outside Fences of Woven Wire

Groups of Ranches By Sizes	Number of Ranches Studied	Number of Ranch Operators Report- ing Outside Woven Wire Fences						
		Total Number	Height of Fence					Height not Stated
			26''	30''	36''	41''	51''	
Total .....	97	90 <sup>93</sup>	3	2	7	22	70	3
Under 1 section .....	1	1	0	0	0	0	0	1
1 and under 2 sections .....	10	6	1	1	1	0	1	2
2 and under 4 sections .....	5	5	2	0	1	1	4	0
4 and under 8 sections .....	25	22	0	0	2	9	14	0
8 and under 12 sections .....	19	19	0	1	2	4	17	0
12 and under 20 sections .....	18	18	0	0	0	4	17	0
20 and under 32 sections .....	9	9	0	0	1	1	8	0
32 sections and above .....	10	10	0	0	0	3	9	0

<sup>93</sup> Seventeen operators report woven wire of two sizes in use.

*Cost of Fencing*

The cost of fencing varies with the type of fence built. It varies in Sutton County from as low as \$150.00 per mile for some of the cheaply constructed barbed wire fences to as much as \$750.00 per mile for the best constructed wolf-proof fence. The standard wolf-proof fence costs about \$650.00 per mile. The more expensive fences are better constructed, having better posts set closer together, higher and heavier woven wire and an extra number of barbed wires at top and bottom. Some ranchmen have laid flat rocks on the inside of the fences to prevent wolves or other wild animals from scratching under.

The total cost of the 1949 miles of fence in Sutton County according to the ranchmen was \$946,346.00. The average cost of fences per ranch in Sutton County is \$9,854.00. The cost per section averages \$630.00. The average cost per mile of fence is \$485.00. The ranches showing the greatest cost per section are the one- and two-section ranches. The two-section ranches show an average cost of \$1,274.00 per section and the lowest cost is in the 12- and under 20-section group where the average cost per section is only \$547.00. The greatest cost of fence per mile is in the group of ranches containing 32 sections and above, though there is no great difference in the cost per mile in any of the groups from the two-section ranches and above.

Table 56 shows the cost of fence on the 97 ranches studied in Sutton County, grouped according to the kind of fence and the size of ranches.

**FENCES AS RELATED TO OVERHEAD EXPENSES**

Fences represent the largest single item of overhead investment on the ranch. The total estimated value of all fences in Sutton County at the time this study was made was \$946,346.00. This is an average of \$630.00 per section. At the rate of 10 per cent. per annum this would mean a total charge of \$63.00 interest on fences, per section.

Formerly the size of the ranch was a very important factor in determining the amount of overhead expense due to the fencing because of the fact that most of the fence was outside or

TABLE 56  
Showing values of all outside fences, all inside fences, total value and value per ranch, section, acre and mile.

Groups of Ranches By Sizes	Number of Ranches Studied	Value of Fences									
		Outside Fences		Cross Fence		All Fences					
		Woven	Barbed	Woven	Barbed	Total Value	Value per Ranch	Value per Section	Value per Acre	Value per Mile	
Total	97 <sup>94</sup>	\$443,572	\$39,212	\$412,316	\$48,246	\$946,346	\$9,858	\$ 630	\$0.98	\$485	
Under 1 section	1	550	0	400	0	950	950	950	2.26	238	
1 and under 2 sections	10 <sup>95</sup>	5,400	2,432	1,866	825	10,523	1,169	1,169	1.79	376	
2 and under 4 sections	5	8,175	1,081	3,700	1,053	14,009	2,802	1,274	1.90	492	
4 and under 8 sections	25	59,688	10,160	35,350	10,305	115,503	4,620	797	1.25	453	
8 and under 12 sections	19	69,975	5,423	53,450	6,279	135,127	7,112	742	1.16	494	
12 and under 20 sections	18	74,934	1,237	59,400	4,491	140,062	7,781	547	.85	491	
20 and under 32 sections	9	65,225	1,764	65,600	5,436	138,025	15,336	608	.95	486	
32 sections and above	10	159,625	17,115	195,550	19,857	392,147	39,215	584	.91	495	

<sup>94</sup> One ranch operator, owning 640 acres, makes no report on fences.

<sup>95</sup> *Ibid.*



line fence. It is readily seen that in the case of the one-section ranch there must be four miles of outside fence. If partnership fences are assumed, then each one-section ranch has to carry the expense of two miles of outside fence. A sixteen-section ranch on the other hand requires only 16 miles of outside fence or one mile per section. Granting that this fence is likewise owned in partnership, the 16-section ranch owner has only a half mile of outside fence per section, or one-fourth as much as one-section ranch. Thus as the size of the ranch increases the overhead expense due to outside fences decreases.

It has been found that inside fences are essential to the best management of the ranges and the livestock. Accordingly ranchmen have laid out their ranges into so many pastures and "traps" that the total number of miles of cross fences in Sutton County exceeds the number of miles of line fences. The inside fences are as a rule not as expensive as the line or outside fences. Of the 90 ranchmen who reported outside woven wire fences, 70 reported having 51-inch wire, and most of the others as having 41-inch. Of the 75 who reported on inside fences, 26 reported having 51-inch and 17 had 41-inch woven wire. The remaining 32 ranchmen may be divided into three groups having approximately equal mileages of 26-, 30-, and 36-inch wire.

The average investment for all outside fences per section is \$321.00. The group of ranches showing the greatest value of outside fence per section is the one containing one and under two sections, which has a value of \$870.00. The group of ranches showing the least value of outside fence per section is the one containing 32 sections and above, which has a value of \$263.00.

The average value of all inside fences per section is \$308.00. The group of ranches showing the greatest value of inside fences per section is the one containing two and under four sections which has a value of \$432.00. The group of ranches which shows the least value of inside fence per section is the one containing 12 and under 20 sections, which is \$250.00 per section.

Table 57 shows the value of all fences per section and per mile, grouped according to the size of the ranches.

TABLE 57

Showing total value of all fences per section and per mile, grouped according to size of ranches

Groups of Ranches By Sizes	Number of Ranches studied	Value of All Fences		
		Total Value	Per Section	Per Mile of Fence
Total .....	97 <sup>96</sup>	\$946,346	\$ 630	\$485
Under 1 section .....	1	950	950	238
1 and under 2 sections .....	10 <sup>97</sup>	10,523	1,169	376
2 and under 4 sections .....	5	14,009	1,274	492
4 and under 8 sections .....	25	115,503	797	453
8 and under 12 sections .....	19	135,127	742	494
12 and under 20 sections .....	18	140,062	547	491
20 and under 32 sections .....	9	138,025	608	486
32 sections and above .....	10	392,147	584	495

<sup>96</sup> One ranch operator, owning 640 acres, makes no report on fences.

<sup>97</sup> Ibid.

The amount of overhead expense is greater for the smaller than for the larger ranches notwithstanding the increase in the number of miles of inside fences as the ranches increase in size. The figures in Table 57 show, however, that after the four- and under eight-section group of ranches is reached, the overhead due to fencing does not decrease appreciably as the size increases. The number of miles of outside fence falls off rapidly with increase in size, but this decrease is counter-balanced by the increase in the number of miles of inside fence.

Ranchmen expressed the opinion that pastures should vary from one to six sections in size depending upon the type of ranching pursued and the purpose for which the pasture is used. The ranchman who has eight sections of land may not require any more fence per section than the ranchman who has 32 sections and engaged in the same type of ranching. It is

a fact, however, that the men running the big ranches are as a rule engaged in a type of ranching that requires less fencing than is required by those running the small and medium sized ranches. Statistics on the amount and kind of livestock kept, show that the men running the small and medium sized ranches run but few steers, mutton sheep and goats. These animals can be run in much larger pastures than mother animals, especially ewes and does. At the present time the men running the big ranches run a great many steers and mutton sheep and goats and they, therefore, have frequently very large pastures and cut down overhead expense due to fencing. If the ranchman is engaged in stock-raising rather than grazing of steers and muttons, the six- and nine-section ranches possess all the economies possible in fencing.

## BUILDINGS

### *Headquarters Houses*

In the early days, the only building on a ranch was the headquarters house. This was almost invariably a crude affair. In some sections it was only a sort of dugout. In other sections it was a small boxed house with a porch and probably a lean-to. The development in the quality and number of



Figure 42. Some ranch headquarters houses.

houses on the ranches in Sutton County has not as a rule proceeded as rapidly as the development in quality and amount of fence. Improvements have been greatest in regions of medium sized ranches devoted to the production of cattle, sheep and goats. The well equipped ranch in Sutton County of medium size has a headquarters house, a laborer's cottage, a barn, sheep and goat sheds, a salt house, a saddle room, a garage, a smokehouse and a shop building. The headquarters houses represent the greatest value in buildings.

The headquarters houses on the 97 ranches studied in Sutton County represent a total valuation of \$205,375.00. The average value of the headquarters house is \$1643.00. The average value per section is \$136.00. The small ranches show the greatest outlay per section for dwellings, but the least amount per ranch. The owners of the small ranches have, therefore, poorer quarters to live in, but pay a higher rate of overhead expense per section for their houses. This is especially important in view of the fact that the investment in a dwelling is unproductive in the sense of producing a money income and yet it requires considerable upkeep. The man on a 10-section ranch can have a two-thousand dollar home with an investment of only two hundred dollars per section, while the ranchman who builds a two-thousand-dollar home on a one-section ranch has an investment of two thousand dollars per section upon which the interest may be greater than his net income. The man who buys a ranch with an elaborate dwelling on it or who builds one for the comfort of his family rather than for the business purposes of the ranch, cannot logically consider its cost as a part of his productive investment. It is one of the items of his family expense rather than an investment for production. He has no right, therefore, to claim interest on the consumption expenses of housing his family so long as it does not contribute directly to the production of ranch products.

The headquarters houses in Sutton County, however, are not of this type. Practically every one of them is used primarily as a part of the business organization of the ranch. Their average cost is moderate if not below what would be considered a satisfactory standard of good living conditions. The

ranchman, and as a rule his entire family, does ranch work of one kind or another and thus contributes materially to the efficiencies and economies of the business. So long as the houses are used primarily in connection with production rather than as a home for a family which does not do ranch work, it is legitimate for their cost to be included in the productive ranch investment. The headquarters houses in this study are on this basis included among the income-yielding buildings.

Table 58 shows the value of headquarters houses on the 97 ranches studied in Sutton County, per house, per ranch and per section, grouped according to the size of ranches.

TABLE 58  
Showing Value of Headquarters Houses on Ranches

Groups of Ranches By Sizes	Number of Ranches Studied	Value of Headquarters Houses				
		Total	Per Ranch	Per Section	Per House	
					Number	Value
Total .....	97	\$205,375	\$2,113	\$ 136	125	\$1,643
Under 1 section .....	1	2,000	2,000	2,000	1	2,000
1 and under 2 sections ...	10	5,250	525	525	10	525
2 and under 4 sections ....	5	4,000	800	363	5	800
4 and under 8 sections ..	25	35,600	1,424	245	25	1,424
8 and under 12 sections ..	19	31,475	1,656	172	20	1,574
12 and under 20 sections..	18	31,300	1,738	122	24	1,304
20 and under 32 sections	9	44,600	4,955	196	13	3,431
32 sections and above ....	10	51,150	5,115	76	27	1,894

*Other Buildings*

There are buildings on ranches such as laborer's cottages, barns and sheds, which are constructed because it is believed that they add to the net income. The primary purposes of such buildings are to prevent loss of animals or feed, to lessen the amount of feed required, to save labor and to aid in produc-

ing animals of improved quality. Such buildings increase the overhead expense per ranch, but if they are wisely built and used, they may lessen the overhead expense per unit of product. No ranchman who is working for the greatest net income will build an expensive improvement until he has answered the questions "Will it pay?" and "How will it pay?"

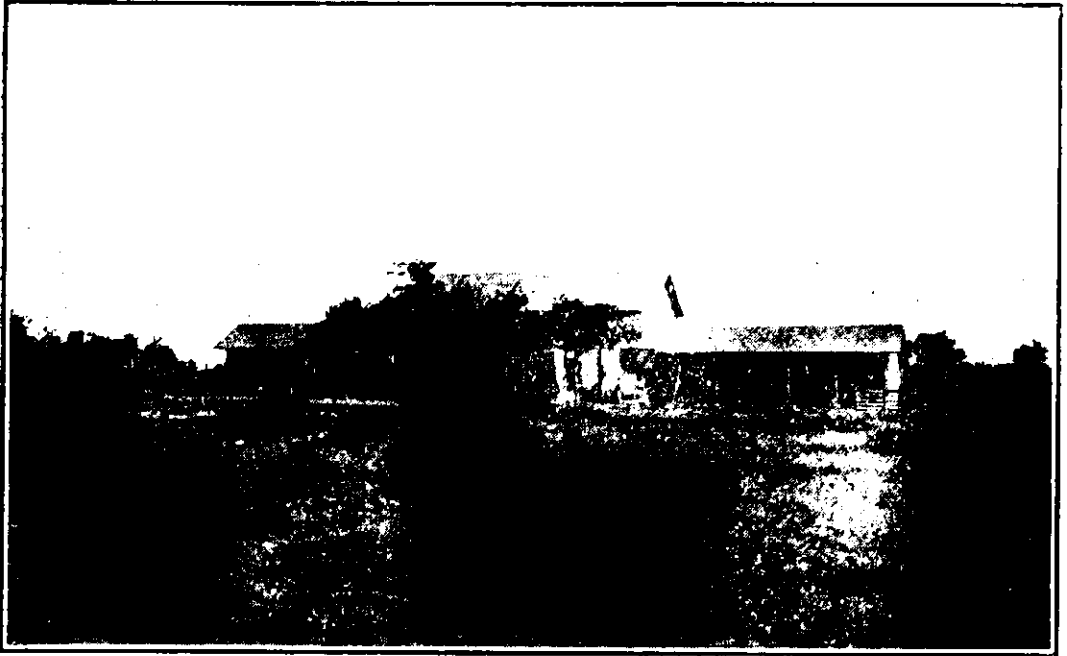


Figure 43. Sheep barn, Ranch Experiment Station.

The fact that the smaller ranches show a greater outlay per section of land for this kind of improvements does not indicate that their capital is less productive per unit than the capital of larger ranches. It might be either more or less, depending upon the use made of the equipment. It does mean that the ranchmen with such buildings must use more intensive methods than the ranchmen with more land and less buildings.

The size of the ranch has very little to do with the relative amount of overhead expense due to barns and sheds. The fact that the small and medium sized ranches show a greater value of barns and sheds per section does not indicate that they have an overhead expense that the larger ranchmen would not incur were they engaged in exactly the same type of ranching as the small and medium sized ranchmen. The fact is, the barns and

sheds may readily be adjusted to the demands of the particular sized ranches. If a ranch is much larger than eight sections, buildings like sheds and salt houses must be duplicated to secure the best results from the management of the animals and the range where diversified grazing is practiced.

The value of all the income-yielding buildings on the 97 ranches studied amounts to \$189,635.00. The average value per ranch is \$1955.00. The average value per section is \$126.00. The average value per acre is \$0.1969.

Table 59 shows the value of the various kinds of buildings on the 97 ranches studied in Sutton County, their value per group, per ranch, and per section, grouped according to size of ranches.

TABLE 59  
Part I  
Showing the Kind, Numbers and Values of Income-Producing Buildings on Ranches, Grouped according to the Size of Ranches.

Groups of Ranches By Sizes	Number of Ranches Studied	Laborers' Cottages		Barns		Sheds		Salt Houses		Saddle Houses	
		Number	Value	Number	Value	Number	Value	Number	Value	Number	Value
Total .....	97	83	\$83,700	94	\$78,860	91	\$54,985	54	\$3,635	16	\$1,945
Under 1 section .....	1	0	0	1	3,000	1	25	0	0	0	0
1 and under 2 sections .....	10	0	0	6	1,850	5	550	1	30	1	50
2 and under 4 sections .....	5	3	600	2	2,150	4	1,460	3	155	0	0
4 and under 8 sections .....	25	7	3,300	17	11,910	20	10,575	4	250	0	0
8 and under 12 sections .....	19	13	5,600	14	14,400	15	11,825	6	760	3	460
12 and under 20 sections .....	18	15	4,800	21	20,700	17	12,000	6	310	2	360
20 and under 32 sections .....	9	16	7,100	13	10,500	11	7,950	3	175	0	0
32 sections and above .....	10	29	12,300	20	14,350	18	10,600	31	1,955	11	1,075



TABLE 59  
Part II  
Showing the Kind, Numbers and Values of Income-Producing Buildings on Ranches, Grouped According to the Size of Ranches.

Groups of Ranches By Sizes	Number of Ranches Studied	Garages		Smoke Houses		Shop Bldgs.		Other Bldgs.	
		Number	Value	Number	Value	Number	Value	Number	Value
Total	97	63	\$7,435	42	\$3,835	4	\$660	20	\$4,580
Under 1 section	1	0	0	0	0	0	0	1	100
1 and under 2 sections	10	5	275	5	305	0	0	0	0
2 and under 4 sections	5	2	200	2	125	0	0	0	0
4 and under 8 sections	25	13	2,290	6	335	1	200	8	2,465
8 and under 12 sections	19	9	835	6	645	1	100	0	0
12 and under 20 sections	18	14	1,140	10	730	0	0	3	140
20 and under 32 sections	9	6	720	2	170	1	60	5	375
32 sections and above	10	14	1,975	11	1,525	1	300	3	1,500

**THE WATER SYSTEM**

The three essentials of a ranching country are water, grass and protection. The essentials of a good water supply are an abundance of water of good quality and its proper distribution. The discovery of inexhaustible supplies of water in deep wells and the improvement of windmills to pump a two- to three-inch stream of water simplified the matter of pumping and convinced the most skeptical people that large herds and flocks could be watered from deep wells and windmills. From that time forward, wells and windmills have multiplied at such a rapid rate that Sutton County is as well supplied with good wholesome stock water as any ranching section of the United States.

There are 93 ranches of the 97 studied in Sutton County which depend on artificial water supply for their livestock. These all have deep wells and windmills and depend on them entirely or almost entirely for their water. The four remaining

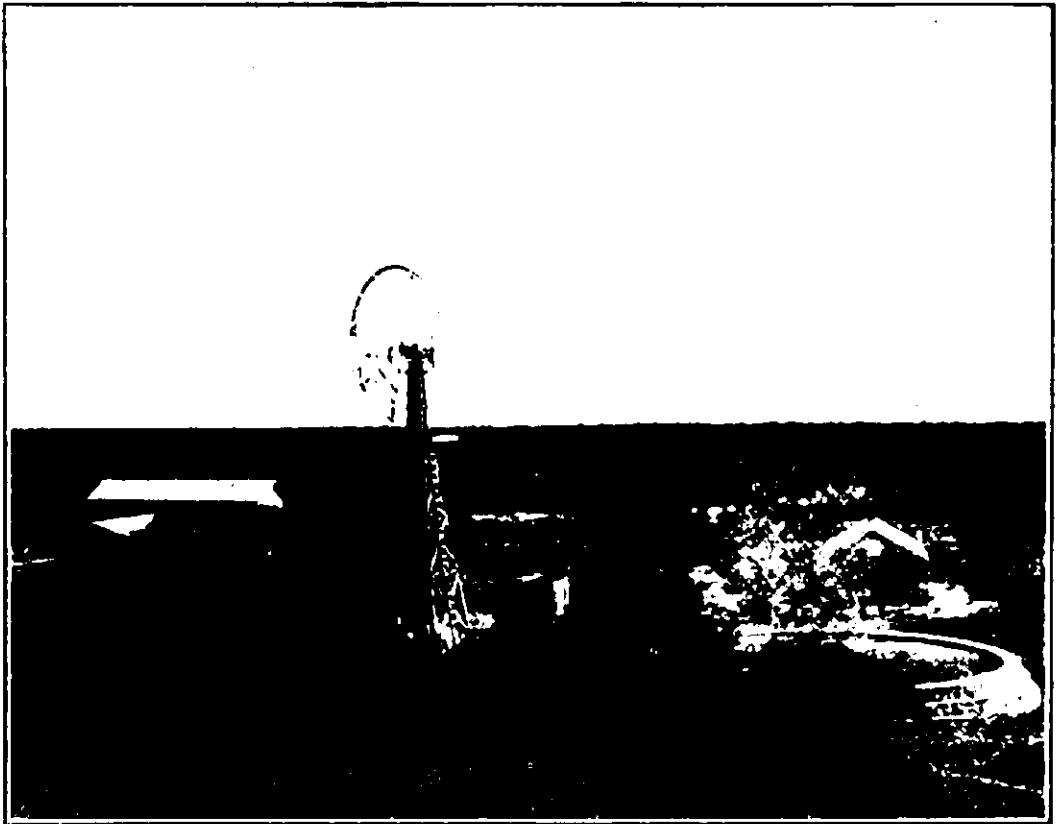


Figure 44. Well, windmill and reservoirs on Ranch Experiment Station, showing the modern type of watering system for ranches.

ranches studied are small ones and are located on the Llano River. They have shallow dug wells for home use. There are at the present time 307 wells on the 93 ranches depending on wells and windmills as their main or only source of stock water. The number of wells per ranch varies from one to twenty-two. The average number per ranch is three and the average number of sections watered from one well is 4.8.

### *Cost of Water Supply*

The elements of cost in the water supply artificially provided are wells, windmills, storage facilities, troughs, piping and upkeep. The cost of the wells depends primarily upon the depth. The average depth of wells in Sutton County is 273 feet. The shallowest well in the county is 10 feet and the deepest well in the county is over 500 feet. Over 80 per cent. of the wells in Sutton County are between 200 and 350 feet deep. The deepest well on the Ranch Experiment Station, located on top of a divide, is 414 feet.

The charge for drilling wells is on a per foot basis. At the present time well drillers are charging \$1.00 per foot for the first 100 feet, \$1.25 per foot for the second 100 feet or fraction thereof, and \$1.50 per foot after passing the depth of 200 feet, and an additional 25 cents per foot for each additional 100 feet or fraction thereof.

The total cost of drilling all the 307 wells, including the piping in the wells, used for watering stock is estimated by the ranchmen to have been \$143,492.00. The average cost of drilling plus piping the water to the surface is \$467.50 per well. No casings are used, as the walls are solid rock. The average cost per ranch varies from \$485.00 for the one-section ranches to \$5,438.00 for the ranches with 32 sections and above. The cost of putting down wells per section varies from \$485.00 for the one-section ranch to as low as \$81.00 per section for the ranches containing more than 32 sections. The average cost of wells per section is \$96.00 for the area studied. There is very little variation in cost of wells per section after the group containing nine to twelve sections is reached. From four to six sections are all that one well should water and if a ranchman

has more sections than that, he is forced to have more wells. The one-section ranch has much the highest overhead cost due to wells since it of course makes no difference in the cost of drilling a well whether it is to water the stock on one section or five sections.

Table 60 shows the number of wells used for watering range livestock, their depth, the average cost, the cost per ranch and the cost per section, grouped according to the size of ranches.

The value of windmills depends on the kind and the size of mill bought. The average value of the 307 windmills in Sutton County, towers and pumps included, amounts to \$520.00. The cost per unit of wells, piping, windmills and troughs is about the same regardless of the size of the ranch. The size of the mill required varies with the depth of the well and exposure to the wind.

*Reservoirs:* A reservoir is a very important factor in providing a continuous water supply. Ranchmen who merely drill wells and put up the windmills run great risks of getting out of water during protracted dry, hot, still times. There may be days or even weeks that the wind does not blow sufficient to furnish a water supply for the livestock. This difficulty is overcome by two methods. A few ranchmen depend on gasoline engines to run their pumps when the wind is not blowing. Most ranchmen, however, have found it cheaper and surer to provide large storage facilities for water.

The first reservoirs were large dirt tanks. Wells were drilled in small draws or level places where storage could be easily made. These dirt tanks multiplied at first almost as rapidly as windmills. Some of them held water satisfactorily, but most of them were of limited usefulness because of the porosity of the soil. Experience soon taught the ranchmen that the leakage of water from dirt tanks jeopardized the water supply.

At the headquarters well, the ranchmen also provided small storage facilities by installing cypress or zinc reservoirs for domestic purposes. Some men installed large reservoirs of wood or zinc to provide an emergency water supply for their

TABLE 60

Showing the number of wells used for watering range livestock, their depth, the cost for drilling and piping per ranch and per section, grouped according to the size of ranches.

Groups of Ranches By Sizes	Number of Ranches Studied	Number of Ranches Reporting Wells	Area in Sections of Ranches Reporting Wells	Number of Wells Reported	Total Cost of Wells for Drilling and Piping	Average Cost of Wells per Ranch Report-	Average Cost of Wells per Section
Total .....	97	93	1,491	307	\$143,492	\$1,532	\$96
Under 1 section .....	1	1	1	1	416	416	416
1 and under 2 sections .....	10	7	7	7	3,398	485	485
2 and under 4 sections .....	5	5	12	8	2,828	567	236
4 and under 8 sections .....	25	25	145	39	16,028	641	111
8 and under 12 sections .....	19	18	172	46	23,452	1,303	136
12 and under 20 sections .....	18	18	256	45	21,144	1,175	82
20 and under 32 sections .....	9	9	227	45	21,841	2,427	96
32 sections and above .....	10	10	672	116	54,385	5,438	81

livestock. The expense of providing a large reserve water supply by such means was found to be impractical.

The advantages of the rock reservoirs over dirt, wood or metal are (1) when properly constructed they obviate the waste of water through leakage or seepage; (2) they provide a continuous source of pure water and prevent the spread of diseases and parasites commonly experienced with dirt reservoirs, water holes and even running streams; (3) they are of permanent construction; (4) they may be suitably distributed over the ranges, and (5) the material for their construction is everywhere available in the Edwards Plateau. In recent years the water storage problem has been solved by the introduction of large rock reservoirs 50 to 100 feet in diameter and four to six feet deep.

The present water storage facilities in Sutton County are supplied in a number of different ways. There are 145 dirt reservoirs, 24 cypress and zinc reservoirs, 14 natural water holes and 154 rock reservoirs. Of the 93 ranchmen who depend more or less on deep wells and windmills for their stock water, 66 have rock reservoir facilities. There are 17 ranchmen who depend on dirt storage reservoirs alone. There are eight ranchmen who have no rock reservoirs, but who have either a cypress reservoir or a spring or river.<sup>98</sup> The water holes are gradually filling up and were never of any very great significance. The cypress and zinc reservoirs are likewise going out of use just about as rapidly as they decay. The dirt reservoirs are being abandoned if not destroyed. The dirt reservoir for storing well water will therefore undoubtedly become obsolete in Sutton County in the course of a few years. Some believe, however, that the dirt reservoir for storing storm water, in providing a temporary water supply some distance back from the wells, will always serve a useful purpose. A man, for example, who has a large pasture may construct a dirt reservoir in the part of the pasture remote from the well. It is his opinion that the livestock will graze in the neighborhood of this reservoir as long as the water lasts and then move to the neighborhood of the well. By this means he secures a better utili-

<sup>98</sup> Two large operators having an aggregate of 172 sections failed to report on their water storage facilities.

zation of his grazing area than he would if he simply had but one source of water.

It is generally conceded that, all things considered, the rock reservoir is the best and the most economical way of securing ample water storage facilities. The estimated total capacity of the rock reservoirs in Sutton County is 13,578,000 gallons. As a rule a cow will drink about 10 gallons of water per day during hot summer days. Sheep and goats will drink on an average of about three quarts per day.<sup>39</sup> As shown in the livestock statistics there are 67,871 cattle, 271,876 sheep, and 124,122 goats in Sutton County. The rock reservoirs as water storage facilities are ample, therefore, for carrying all the cattle, sheep and goats in Sutton County for a period of at least two weeks.

The cost of rock reservoirs in Sutton County varies according to the time they were built, their size and the character of their walls. There are several rock reservoirs now under construction. These are 100,000 gallons capacity and are awarded on contract for \$1200.00 each. Before the increase in the cost of labor and material such a reservoir cost in the neighborhood of \$700.00. The rock reservoirs in Sutton County are now valued at \$161,544.00. The interest on the investment in rock storage reservoirs in Sutton County amounts to about \$0.123 per carrying capacity unit per year.

There is one rock reservoir to every 6.9 sections of land on the 66 ranches reporting rock reservoirs. It is estimated by the ranchmen that one watering system if properly placed could water six sections, but no more. According to the foregoing figures there are sufficient storage reservoirs to almost supply the area under consideration, if they were properly distributed. It is a fact, however, that these rock reservoirs do not always serve their maximum possibilities. In the first place the one-section ranchman who builds one, has greater storage capacity than is absolutely necessary and many of the larger ranches do not have enough. The greatest number of rock reservoirs per section is found in the group of ranches containing one and under two sections which has one rock reservoir to every 3 1-3

<sup>39</sup> For data concerning the amount of water consumed by different types of livestock see pages 404, 496, and 516 of "Feeds and Feeding," by W. A. Henry and F. B. Morrison. Fifteenth edition, 1915; The Henry-Morrison Company, Madison, Wisconsin.

sections. The least number of rock reservoirs is found in the group of ranches containing 32 sections and above. This group has one to every 13 sections, or less than half enough.

*Pumping Engines:* The ranchmen on the 97 ranches report a total of 113 pumping engines with pump jacks. The estimated cost of these engines and jacks is \$22,600.00. The average cost per ranch is about \$233.00. The least cost per ranch of those having pumping engines is \$200.00 in the group of ranches below 12 sections. The greatest cost per ranch is \$1266.00 in the group of ranches containing 32 sections and above. The greatest cost per section for pumping engines for those ranches having pumping engines is in the group containing one section, which has a cost of \$200.00. The least cost per section for pumping engines is \$17.00 in the group containing 32 sections and above.

The total cost of the water supply, wells, windmills, pumping engines and jacks, rock, zinc and wood reservoirs, troughs and piping to troughs on the 93 ranches depending on artificial water supply in Sutton County is about \$542,986.00. The total cost per ranch is \$5,839.00; per section \$365.00, and per well about \$1769.00. The seven one-section ranches that have windmills have the greatest amount per section invested in watering systems. The average investment per section for these ranches is \$1609.00. The average investment per section in the group of ranches containing 32 sections and above is \$283.00. The interest on the investment in stock watering facilities at eight per cent. amounts to about \$0.41 per carrying capacity unit per annum. To this should be added the cost of operation, repairs and depreciation.

### DIPPING VATS

There are 104 dipping vats on the 70 ranches having dipping vats. There is one dipping vat to every 14 sections of the 97 ranches studied. The 104 dipping vats cost a total of \$29,800.00. The average cost per ranch of the ranches reporting dipping vats is \$426.00. The average cost per section on the 1369 sections included in ranches having dipping vats is \$22.00. The group of ranches showing the greatest cost per



section for dipping vats is the one containing the one-section ranches which has an average of \$267.00 per ranch of those having vats. The least cost of dipping vats per section is \$13.00 which is in the group of ranches containing 32 sections and above.



Figure 45. Dipping Cattle.

## EFFICIENCY IN PERMANENT IMPROVEMENTS

Efficiency in the use of permanent improvements is influenced (1) by quantity—whether one has more or less than economically necessary; (2) by the quality—whether suited or unsuited to the purposes which improvements are intended to serve, and (3) by their location on the land. One man, for example, may build a few miles of ranch fence and find it almost constantly in his way, while another man may build twice as many miles of fence on a ranch of similar size and find every foot of it not only useful, but practically indispensable. The former, by failing to look ahead and planning his location carefully, may have placed his fence where it would not serve him to best advantage, whereas the latter may have planned well and taken into consideration all the factors influencing the location of fences such as the size and arrangement of pastures,

the topography of the land and the location of the other permanent improvements such as wells and buildings.

The quality of permanent improvements is determined by (1) their purpose; (2) intensity of the use to which they are put; (3) the time that they are expected to last, and (4) the amount of repairs necessary to overcome depreciation and to maintain them in good usable condition.

The quantity of permanent improvements depends upon (1) The size of ranches. While small or diversified ranches have a greater mileage of fence per unit of area, the larger ranch has a greater total mileage. The amount of fence tends to vary directly, therefore, with the size of the ranch and the intensity and diversity of the type of ranching pursued. (2) The topography. One ranch may require more fences and watering places than another because of topographic conditions. Other things being equal, a level ranch will require less fence expense than one the topography of which is rough. (3) The type of ranching. More fence will be required for diversified ranching wherein cattle, sheep and goats are run than for single purpose ranching wherein cattle alone are run.

#### RELATION OF PERMANENT IMPROVEMENTS TO COST OF PRODUCTION

The total cost of permanent improvements on the 97 ranches studied in Sutton County is estimated to be \$1,914,142.00. This is a total of \$19,731.00 per ranch; \$1,272.70 per section or \$18.21 per carrying capacity unit actually utilized in the county in August of 1920, or \$1.99 per acre.

Table 61 shows that the total cost of permanent improvements per section is greater on the small ranches than those on the larger ones. On the one-section ranch the investment per carrying capacity unit is \$37.46; on the 8- to 12-section ranches \$23.40, and on the 32 sections and above ranches \$14.92 per carrying capacity unit.

The fact, however, that the value of permanent improvements per unit of carrying capacity is higher in one group of ranches than in another does not always mean that the cost of production in the one group is higher than that in the other.

TABLE 61  
 Showing the estimated value of all productive permanent improvements on the 97 ranches studied in Sutton County grouped according to the size of ranches

Groups of Ranches By sizes	Number of Ranches Studied	Total Value	Value of Fences	Value of Buildings Other Than Headquarters Houses	Value of Dipping Vats	Value of Water System	Value of Headquarters Houses
Total .....	97	\$1,914,142	\$946,346	\$189,635	\$29,800	\$542,986	\$205,375
Under 1 section .....	1	7,061	950	3,125	0	986	2,000
1 and under 2 sections .....	10	30,901	10,523	3,060	800	11,268	5,250
2 and under 4 sections .....	5	32,949	14,009	4,690	300	9,950	4,000
4 and under 8 sections .....	25	251,028	115,503	31,325	5,400	63,200	35,600
8 and under 12 sections .....	19	297,099	135,127	34,625	5,300	90,572	31,475
12 and under 20 sections .....	18	306,706	140,062	40,180	4,800	90,364	31,300
20 and under 32 sections .....	9	299,096	138,025	27,050	4,200	85,221	44,600
32 sections and above .....	10	689,302	392,147	45,580	9,000	191,425	51,150

As in other phases of ranching, the dominant viewpoint is the greatest net return.

The addition of permanent improvements increases the expense of ranching (1) by the amount of interest on their original cost; (2) their upkeep and operating expense, and (3) their depreciation. On the other hand they add to the ranch income by (1) reducing the death losses; (2) increasing the percentage of calf, lamb and kid crops; (3) increasing the carrying capacity of the ranges; (4) improving the quality of the livestock; and (5) reducing the expenses of management.

Whenever one is in financial position to do so and the expense involved results in an increase in net returns for the ranch, it is economically sound to add permanent improvements beyond present needs, under certain conditions. If, for example, there is a tangible prospect of increasing the future income of the ranch by improving the quantity and quality of the livestock run, such improvements may be advisable. It is economically sound, for example, for one to take the long-time viewpoint in the matter of the construction of fences. If a man is running scrub cattle, a cheap barbed wire fence of temporary construction may suffice. But if in the course of a few years he finds it necessary to improve the quality of his cattle and to diversify his livestock by also running sheep and goats on his ranges, he may find that his makeshift fences were a poor investment. He will be compelled to build a modern sheep, goat and cattle fence and, in doing so, he will find that he loses not only much of the value of the original materials, but also the labor expended in the construction of the original fence and in taking it down. This being the case, it would pay such a man to anticipate his future needs and build accordingly. If he is to secure maximum returns from his investments in improvements, he should be governed by the long-time point of view so far as possible and, instead of following the line of least resistance and resorting to makeshift construction, his improvements should be of a permanent character.

Permanent improvements become a burden when they are more expensive than is at all necessary for present or future needs. A watering system, for example, may be either too large or unnecessarily expensive for the area watered. A sin-

gle watering unit will, of course, water four sections as effectively as it will water one section. Some ranchmen construct unnecessarily expensive watering outfits for the reason that they have not accurately estimated the water requirements of the livestock on the area which can be served by a single watering place. The result is that they sometimes drill a well deeper or of greater diameter, install a larger windmill and tower or erect a larger reservoir than is necessary. All such items increase the overhead expense of the watering system. Similar statements might be made of other forms of permanent improvements.

# CHAPTER X

## MOVABLE CAPITAL

### DEFINITIONS

Ranch movable capital consists of all those goods which may be moved about, increased or decreased more readily than other forms and which are employed by the ranchmen for the production of income. Because of the fact that it is movable, divisible and marketable, this class of capital is more often increased and decreased in changing the proportions of the factors of production than either land or permanent improvements. It includes livestock, crops, machinery, implements, tools and either money or credit for operating expenses.

Movable capital differs from permanent improvements in that the latter are attached to the soil, are more permanent and ordinarily are sold with the land. Movable capital is unattached to the soil, is consumed within the year or the period of a few years and ordinarily is bought and sold independently of the land.

The chief function of movable capital is to serve as an instrument in the hands of the ranchmen to help convert the resources of the land and permanent improvements into usable or salable goods. In a ranching section it means the conversion of natural products such as grass, weeds and browse into meat, wool, mohair and other salable products. Grazing lands are stimulated to greater production not by cultivation, but by the manipulation and control of certain factors influencing carrying capacity enumerated in Chapter VIII.

The limited areas of tillable lands are sometimes cultivated for the purpose of producing supplementary feed crops. When such is the case, of course, work animals, implements, tools and operating expenses for labor are employed.

Movable capital represents the most liquid asset of the ranch. In an emergency one can sell horses, mules, cattle, machinery, implements or tools. It is more difficult to add to or take from the landed area and permanent improvements than the movable capital. If, for example, a ranchman has constructed a rock reservoir of 50,000 gallons capacity he cannot

economically increase or decrease its size. On the other hand the amount of movable capital may be increased or decreased almost at will. It consists of a large number of more or less independent units of comparatively small value. The owner of a ranch may own five thousand different animals, any one or more of which he can sell, and keep the rest. In case his land produces more forage during a given year than his livestock can consume, he does not attempt to make the proper adjustment by selling land, but he makes it rather by increasing the numbers of livestock grazed. Conversely if he has more livestock than grazing, he normally sells livestock instead of buying more land. Movable capital is, therefore, more often changed in quantity in making the necessary adjustments of land, labor and capital because of its fluidity.

There are two general classes of ranch movable capital based on their relations to the production of income. One of these classes produces income directly and the other indirectly. (1) Direct income-producing capital. This class includes all livestock maintained for breeding purposes, grown for market and maintained for the production of animal products such as wool and mohair. (2) Indirect income-producing capital. This class includes such items as machinery, implements, tools, work animals, saddle horses, feed crops and operating expense money. They are utilized on the ranch as accessories to the direct income-producing class of capital goods. With the exception of feeds and operating expenses which are consumed during their first use, indirect income-producing capital is normally used through several cycles of production. It is kept in use on the ranch as long as it is considered profitably useful and then it is either sold to whoever will buy it at the price it will bring or it is junked.

Profitable ranching is very dependent upon the selection and proper utilization of movable capital. It represents the ranchman's chief and quickest source of profits and losses in the ranch business. The ranchman's capacity to produce economic goods is measured by the amount of movable capital which he is able to manage in its proper relation to the other factors of production. The efficiency of the ranchman is measured by his ability to combine movable capital with permanent equip-

ment and the other factors of production in such a manner as to secure the maximum profit.

A ranchman may not only have improper proportions of land, permanent improvements, movable capital and labor, but he may also not have the best proportions of direct and indirect income-producing capital. A man, for example, may have more or fewer saddle horses than are necessary for the efficient operation of his ranch. Every unnecessary saddle horse not only occasions additional expense, but takes the place of a mother cow. If on the other hand he does not have enough saddle horses to go about his business, he may lose more in a short time than would be required to buy and maintain an extra saddle horse.

Some ranchmen have abilities which are extensive. By this is meant that they are capable of managing a large number of units of a given combination of the factors of production. Other ranchmen who may or may not have extensive ability possess intensive ability. They are able to effect a more perfect combination of land, labor and capital than men not possessing this ability. In exceptional cases, a ranchman may possess both extensive and intensive abilities and in that event he is capable of operating a rather large ranch with remarkable success.

#### AMOUNT OF MOVABLE CAPITAL REQUIRED IN RANCHING

A ranching section has the least amount of movable capital per acre and the greatest amount per man of any type of agriculture. In August of 1920 the estimated value of all movable capital on the 97 ranches studied in Sutton County was \$8,120,907.00; the average per ranch was \$83,720.69; per section \$5,424.79; per acre \$8.48 and per carrying capacity unit \$77.26.<sup>99</sup>

#### *Livestock*

Livestock in Sutton County represents the bulk of the movable capital. The total value of all livestock in Sutton County

<sup>99</sup> During the year following this study, prices slumped until the values of movable capital here indicated were cut practically in half. It is the quantity of movable capital rather than its value at any given time which is of consequence in an economic study of ranching.



in August of 1920, when this study was made, was \$7,981,067.00. Its value per ranch was \$82,279.04; per section \$5,331.37; per acre \$8.33 and per carrying capacity unit \$75.93. The carrying capacity units consumed by cattle, sheep and goats totaled 105,112.

Table 62 shows the total numbers of livestock by types on the area studied as of August, 1920.

TABLE 62  
Showing the total numbers of livestock by types.

Type	Numbers of Heads
Cattle .....	67,871
Sheep .....	271,876
Goats .....	124,122
Horses .....	2,659
Mules .....	184

### *Machinery, Implements and Tools*

The total value of machinery, implements and tools was estimated at \$139,840.00. This amounts to an average per ranch of \$1441.65; per section, \$93.41; per acre \$0.146 and per carrying capacity unit, \$1.33.

Tables 63 and 64 show the numbers and kinds of machinery, implements and tools by groups and totals, in the area studied.

TABLE 63  
Showing automobiles, trucks, tractors, windmill tools, harness and saddles owned by ranch operators

Groups of Ranches By Sizes	Number of Ranches Studied	Automobiles	Trucks	Tractors	Set of Wind- mill Tools	Sets of Harness	Saddles
Total .....	97	108	44	2	17	197	285
Under 1 section .....	1	1	0	0	0	2	1
1 and under 2 sections....	10	8	0	0	0	16	9
2 and under 4 sections ...	5	5	0	0	0	8	7
4 and under 8 sections ...	25	23	7	0	3	34	50
8 and under 12 sections ..	19	20	11	1	1	34	53
12 and under 20 sections ..	18	19	7	0	4	25	55
20 and under 32 sections ..	9	13	6	1	2	32	36
32 sections and above ....	10	19	13	0	7	46	74

TABLE 64

Showing number of implements and ranch machinery owned by ranch operators

Groups of Ranches By Sizes	Number of Ranches Studied	Ranch Machinery								
		Wagons	Cultivators	Planters	Plows	Harrows	Mowers	Rakes	Hay Presses	Binders
Total .....	97	109	49	42	63	19	34	35	8	11
Under 1 section .....	1	0	0	0	0	0	1	1	0	0
1 and under 2 sections .....	10	5	8	6	7	0	1	1	1	0
2 and under 4 sections .....	5	3	4	3	4	0	0	0	0	0
4 and under 8 sections .....	25	20	5	5	11	3	3	3	0	1
8 and under 12 sections .....	19	15	7	9	10	3	6	6	1	1
12 and under 20 sections .....	18	17	7	5	9	0	5	6	1	1
20 and under 32 sections .....	9	16	6	4	7	4	5	5	2	2
32 sections and above .....	10	33	12	10	15	9	13	13	3	6

### *Miscellaneous Forms of Movable Capital*

In addition to the livestock, machinery, implements and tools one may have on hand, the crops grown and ready for harvest in the field or feedstuffs in the barn such as cotton seed meal, grain sorghums and hays may be classed as movable capital. Likewise may be classed all the more quickly consumable supplies such as groceries with which to board the ranch labor and medicines for the livestock.

Credit for current operating expenses has been included inasmuch as it, at the beginning of the year at least, is a form of movable capital. It represents cash on hand or else credit at the bank. It is movable in the sense that it can be converted into any form of utility needed in the course of a season, such as the wages of ranch labor. The cash or credit on hand is in this sense movable capital, but at the end of the season the actual amounts invested in labor might be entered in the labor account.

# CHAPTER XI

## RANCH CREDITS

### DEFINITION

So long as agriculture was conducted primarily on a self-sufficing basis and implements were few and of simple construction, credit was used mainly to obtain consumption goods. Under such conditions borrowing was considered poor business and the taking of interest as usury regardless of the rate.

During the past fifty years, however, a number of inventions, such as the self-binder, the gang plow, the modern cultivator and the cream separator, together with the improvements in transportation and communication and improved methods and facilities for standardizing and storing farm products, have tended to commercialize agriculture. In this stage of development, credit instead of being poor business is considered an essential to best business practices.

Formerly agricultural practices were matters of tradition handed down from father to son. Prior to the 60's there were no agricultural colleges and prior to the 80's no agricultural research agencies which had been in operation long enough to turn out scientifically derived agricultural knowledge. Now that we have a system of agricultural colleges, including experiment stations and extension services, which is functioning well in the discovery and the dissemination of useful information, modern agriculture instead of being merely a matter of physical exertion has become one of applying knowledge along with power in the processes of production.

Moreover the facilities for agricultural education are now constantly bringing to the front young men from families of limited means who possess the ability to handle large amounts of productive capital, but who have no way of obtaining that capital in sufficient quantities except as credit.

*Credit may be defined as the means of enabling individuals or firms to obtain possession of valuable goods by giving to their owners satisfactory guarantees of future payment. A credit instrument is evidence of debt, given in exchange for the desired goods.*

The value of a credit system is measured by the conditions upon which loans may be secured, the efficiency of the loan-making machinery and the type of business which it encourages. A system of credit organized to meet the demands of one type of business may fail to meet the requirements of another. The short-time, 30- to 90-day, credit required by commercial enterprises is almost wholly unsuited to the intermediate-time, six months to five years, turn-over requirements of ranching. As business becomes more highly specialized and the uses of credit are multiplied, the greater will be the need of specialization in credit machinery. It will, of course, have to be amplified and adjusted to meet the changing needs of business and particularly of agriculture.

Ranch credit is necessary to transfer to competent men with little capital the accumulations of men who for one reason or another have more than they can use. Ranch credit is a public benefactor to the extent that it transfers capital from inefficient to more efficient managers and from less productive to more productive fields.

Ranchmen need a system of credit that will give them funds at any time in proportion to their needs and their security. The length of the loan must be commensurate with the length of the turn-over in their business. The rate of interest paid should be in proportion to the size and security of the loans. There should be as little red tape required in securing the loans as is allowable from the standpoint of good business.

The lenders of capital are primarily interested in the security of the principal of the loans and, secondarily, in the net rate of interest on the loans and the promptness with which the obligations are met. Therefore the improvement of credit facilities in the ranch country will depend in part upon the abilities of the ranchmen to eliminate risk and uncertainty from their securities and in part upon the setting up of more efficient credit machinery by the lenders of capital.

The kind of machinery needed for a suitable credit system will depend upon whether the type of business or region to be financed has sufficient local capital for its own needs or whether it is necessary to import the greater part of the funds required. There are some types of business in any given lo-

cality wherein young men or others in the business with insufficient capital normally borrow from those in the same line of business. This is often true of men engaged in farming in well developed agricultural regions. There are other lines of business which produce a surplus to lend. There are still others that for one reason or another have to attract capital from other lines of business. There are regions, especially new countries in the process of development, which do not have enough capital to finance all the lines of business in that region. An industry with insufficient capital in such a region must not only borrow it from some other industry, but must go outside of its own territory for the funds it borrows.

Most ranching areas are comparatively new and have all the difficulties incident to attracting outside capital from other lines of business. The accumulated savings of the ranch people are small compared with their needs for capital. Few men have reached the retiring age and most all are attempting to expand their business. The proper development of such a country demands that large amounts of capital be imported.

The statistics for Sutton County, for example, show that not a single ranch has been acquired wholly by inheritance and only three have been partly inherited. The vast majority, 71 out of 97 in number, have been purchased by the operators and most of the others, 23 in number, have been leased. The 97 ranch operators have a total of \$3,987,000.00 borrowed on land, livestock, wool and mohair. Almost all of this money has to be brought in from outside the county. The total loans and discounts of the only bank in the county on September 8, 1920, amounted to \$643,913.28.<sup>100</sup> Moreover the larger part of its

<sup>100</sup> Statement of condition of the First National Bank of Sonora, Sutton County, Texas, at the close of business on September 8, 1920, as reported to the Comptroller of the Currency:

<b>Resources</b>		<b>Liabilities</b>	
Loans and discounts	\$643,913.28	Capital Stock	\$100,000.00
Acceptances	1,222.00	Surplus	90,000.00
U. S. Bonds	70,000.00	Undivided Profits, net	19,115.95
Stock in Federal Reserve Bank	5,550.00	Circulation	70,000.00
Liberty Bonds	21,242.00	Deposits	392,110.31
Banking house, Furniture and Fixtures	4,800.00	Bills Payable	48,000.00
Other Real Estate	3,400.00	Reserved for Taxes	3,229.05
Cash in Vault and with Banks	114,624.99	Rediscounts	146,036.07
Revenue and War Savings Stamps	249.66	Reserved for Other Purposes	10.55
Five Per Cent. Redemption Fund	3,500.00		
<b>Total</b>	<b>\$868,501.93</b>	<b>Total</b>	<b>\$868,501.93</b>

The above statement is correct: W. L. ALDWELL, President.

Attention is called to the fact that the capital stock of this bank is greater than the average of similar banks in ranching communities.

loans was to merchants in Sonora or ranchmen on personal accounts which are not included in the above figures. Hence ranchmen in this region, as well as most others in the State, have to depend on outside capital for the bulk of their land, livestock and other loans.

Not all of the capital accumulated in the ranch country so far has been reinvested there. Too often the ranch country has been looked upon as a place to make money, but not a place to build homes and reinvest it. Thus the accumulations of the ranch country flow to other regions. Many ranchmen who have been successful have quit ranching and moved to some city to give their families better advantages. Such men often go into another type of business or invest their funds in such a way that the ranch country receives no direct benefits from them. Some of these retiring ranchmen, however, get into livestock commission companies or cattle loan banks through which their money finds its way back into the ranch country. It would be better for ranching and probably for all society if ranchmen would invest their surpluses back on the ranches where made until they are properly equipped not only for ranching purposes, but also as suitable homes for the ranchmen and their families.

### TYPES OF CREDIT NEEDED

There are two kinds of credit demanded in a ranch country. One kind may be called *productive credit* and the other non-productive or *consumption credit*. Consumption credits are loans for things like clothing, furniture, automobiles for pleasure and other expenses not chargeable to ranch production. In case the things bought are luxuries, they may be called spend-thrift loans because the borrower lessens his earning power by making them. Loans made for the purchase of such things are not paid out of the resale of the goods purchased or a pro-

duct which is the result of their use. They usually cause additional sources of drain on productive capital.

*Productive credit may be defined as credit for the purchase of goods for which the borrower expects to pay out of the resale of the purchased goods at advanced prices, or out of a product which is the result of the use of the goods bought.* Loans made for the purchase of such things as land, labor, livestock and machinery, implements and tools are productive loans. The borrower desires a loan for productive purposes because he believes he can increase his net income by the use of additional capital.

*Ranch productive credit may be defined as that credit which is advanced to ranchmen in order that they may adapt the size of their business to their abilities as managers.* Ranch credits may accordingly be classified as follows: (1) credit for ranch lands and permanent improvements; (2) credit for movable capital including livestock and machinery, implements and tools; (3) credit for operating expenses.

### CREDIT ON LAND

The fact that ranching has been a frontier industry, conducted on very cheap if not actually free land, has tended to give credence to the too general impression that land credits are of minor importance in a ranching country. The fact is that with the disappearance of free land, ranch lands have risen in price like other classes and grades of land. Land that could have been bought in Sutton County in 1905 for from two to five dollars per acre is now selling for from eight to fifteen dollars or more.

The 577,520 acres of ranch land in Sutton County operated by owners, 60 in number, in August of 1920 carried a total indebtedness of \$1,465,770.00. This is an average indebtedness of \$2.54 per acre. If only those 54 owners who actually owed money on their land are considered, the average indebtedness per acre is \$2.71. This indebtedness is not greatly in excess of the average cost of permanent improvements for the county which is \$1.99 per acre.

Figured on the basis of indebtedness per acre, these loans are small compared with similar indebtedness in a prosperous

farming country. According to the Fifth Annual Report of the Federal Farm Loan Board the average loan on farm land in Texas is \$22.98 per acre. Viewed from the standpoint of the number of acres involved or the size of loans per individual, however, they are significant. The average indebtedness on ranch land per ranch operated by owners of the above-mentioned ranches is \$24,844.00. The average per ranch of those carrying indebtedness is \$27,144.00.

It has been shown in Chapter 1 that more land is devoted to grazing in the United States than to any other use and that in Texas grazing lands comprise about 73.4 per cent. of the total landed area of the State.

The ranching business is essentially a large scale business. The average sized ranch in Sutton County contains 15 1-2 sections of land. If the ranch is improved as it should be for the best productive purposes, the land and permanent improvements are valued at about \$15.00 per acre. Figured on the basis of this valuation, the average sized ranch is worth about \$150,000.00. If the more usual sized family ranch be taken as the standard, the cost for the land is much less. The six-section ranch costs about \$60,000.00.

Fifty-four of the 60, or 90 per cent. of the ranchmen who own and operate their ranches, owe money on their land. Seventy-eight per cent. of the ranchmen who own part of their ranches, owe money on their land. Complete data were not obtained on land credit on the leased ranches, but it is safe to say that more than 50 per cent. of the owners of leased ranches owe on them. Considered, therefore, from the standpoint of the percentage of people who borrow on land, ranch land credits are perhaps more needed than credit on any other kind of land.

The Texas homestead law is not as serious a handicap to lending on ranch land as on farm land, because 200 acres is a very small part of the average sized ranch. Some ranchmen borrow on land to pay livestock mortgages when it is possible to obtain such loans at lower rates than those on livestock loans.

#### *Federal Land Bank Loans*

The Federal Land Bank does not adequately meet the needs for ranch land loans because the largest amount obtainable—\$10,000.00—is too small. As it is operated at the present time,



it tends to promote a ranch too small in size for efficient production. Only the owners of one- and two-section ranches can use the Federal Land Bank loans, presuming improved ranch land to be worth \$15.00 per acre and that 50 per cent. of its value is to be borrowed. In most cases even the three-section ranch is too small for the proper maintenance of a family.

There are 74 owned and partly owned ranches, but only 70 of these have loans against them. These loans vary in amount from \$700.00 to \$175,000.00. Twenty-eight out of the 70 loans are for less than \$10,000.00 each and 42 are for over \$10,000.00. Thirty-seven loans are under \$15,000.00 and 33 are \$15,000.00 and over. Forty-seven of them are under \$25,000.00. This will indicate that if the Federal Land Bank is to be of much service to ranchmen, the limit of a loan must be increased to at least \$25,000.00. Only one Federal Land Bank loan was found in Sutton County and that was against a one-section ranch. There were 56 owner-operators who had loans. Twenty-six of these were under \$10,000.00 and 30 ranged from \$12,000.00 to \$175,000.00. There were no \$10,000.00 loans.

Table 65 shows the number of loans on land due individuals or banks where both the amount of loan and the rate of interest are stated, classified by amount and rate of interest.

TABLE 65

Showing Loans on Land Due Individuals or Banks, Secured by Owner-Operators, Classified by Amount of Loan and Rate of Interest. Only those included where amount and rate of interest were stated.

Amount	Number Loans	Six per cent.	Six and under 7 per cent.	Seven and under 8 per cent.	Eight and under 10 per cent.	Ten per cent. and over
Total .....	56	1	18	6	26	5
Under \$5,000 .....	13	1	7	2	2	1
\$5,000 and under \$10,000 .....	13	0	2	2	8	1
\$10,000 and under \$15,000 .....	8	0	3	0	4	1
\$15,000 and under \$30,000 .....	7	0	0	1	5	1
\$20,000 and under \$40,000 .....	5	0	2	0	2	1
\$40,000 and under \$60,000 .....	4	0	0	1	3	0
\$60,000 and under \$100,000 .....	4	0	2	0	2	0
\$100,000 and over <sup>101</sup> .....	2	0	2	0	0	0

<sup>101</sup> The two loans over \$100,000 were for \$106,002 and \$175,000.

*Rate of Interest on Land Loans*

Ranchmen are paying a higher rate of interest than the size of the loans and their margin of security would justify. The usual rate of interest on land loans is 8 per cent., though there are some who pay as high as 10 per cent. Both the small and the large ranches are securing loans more cheaply than the medium sized or family ranches. It is possible for the one- and two-section ranches to secure suitable loans from the Federal Land Bank and the big operators are able to command comparatively low rates of interest because of the size of the loans and the amount of their security.

Table 66 shows the 56 loans in Sutton County classified by rate of interest, grouped according to the size of ranches.

*Length of Time on Land Loans*

Land credit requires the longest time for payment of any kind of credit needed by ranchmen. Increasing prices of land and livestock in the past have minimized the problem of paying land debts. At the present time, however, land prices have advanced to a point where the volume of credit demanded is large and the time required to pay loans has increased until it is about as great as in the better farming regions. Ranchmen on the family sized ranches must have a land credit system which is suitable to their recently developed needs or else be severely handicapped in making payments on their ranches.

Ranchmen do not get as long a time on land loans as they should have and the payments are not drawn to suit the convenience of the ranchmen. It is not convenient for the ranchmen to pay every year. Drouth, market conditions, disease among stock or any one of a number of other circumstances may make it desirable for the ranchmen not only not to pay loans, but to borrow more money. The conditions the following year may be very different and the ranchmen may want to pay two, three or even more yearly installments. The amortization plan of payment instituted by the Federal Land Bank with the privilege of making as many payments as desired on any interest date is the method best suited to the needs of ranchmen.

Table 67 shows the number of loans on land due individuals or banks and the length of time for which these loans are made.



TABLE 67

Showing number of loans on land due individuals or banks and the length of time for which these loans are made

Groups of Ranches By Sizes	Number of Ranches Studied	Number of Loans on Land Due Individuals or Banks	Loans on Land Due Individuals or Banks Classified by Length of Time for Which Made				
			4 Years and under	5 Years	6 and under 10 Years	10 Years	Over 10 Years
Total .....	97	72 <sup>102</sup>	9	14	6	37	2
Under 1 section .....	1	0	0	0	0	0	0
1 and under 2 sections ....	10	1	0	0	0	0	1
2 and under 4 sections ....	5	3	1	2	0	0	0
4 and under 8 sections ....	25	15 <sup>103</sup>	1	3	3	7	0
8 and under 12 sections ....	19	18	2	6	2	8	0
12 and under 20 sections ...	18	13	1	1	1	10	0
20 and under 32 sections ...	9	13 <sup>104</sup>	4	2	0	4	0
32 sections and above .....	10	9	0	0	0	8	1

<sup>102</sup> Reported by 57 ranch operators. In the case of four loans, length of time not given. There are only 70 owners and part owners who had loans, but two of these had two each, making the total number of loans 72.

<sup>103</sup> In the case of one ranch, length of time not reported.

<sup>104</sup> In the case of three ranches, length of time not reported.

### *Sources of Land Credit*

Land credit in Sutton County is now obtained from private individuals, loan companies, banks and the State. Big loan companies furnish about 75 per cent. and individuals and commercial banks about 25 per cent. The sources of credit are so scarce and uncertain that it is rarely the case that ranches are purchased with cash. In fact, the seller must often carry a good part of the sale price in the form of a mortgage.

The land loans that the local banks make are merely for the tiding of a ranchman over difficult situations of a temporary nature. This is usually the case when the ranchman has notes coming due in which the lender refuses to renew and the borrower has not been able to find any other source of money. These loans are considered makeshifts and rarely run more than a few months. Such loans usually carry a rate of interest equal to about 10 per cent.

## CREDIT ON MOVABLE CAPITAL

*Livestock*

Livestock credit has a fundamental bearing on ranch production. Cattle, sheep and other types of range livestock constitute the sources of income derived from the ranch business. Ranchmen who are inadequately supplied with the proper kinds and numbers of stock or have stock of an inferior quality, cannot hope to secure the maximum income from the operation of their properties.

Credit needs for the production of range livestock are different from credit needs of feedlot operations. The former is investment and the latter is commercial credit. The ranchmen who buy mother cows to raise steers for the market do not figure on paying for the cows by their resale. They hope to pay for them out of their increase. Therefore the most satisfactory way of financing such a business is by the use of investment capital because such a process requires the use of credit from three to five years. On the other hand, the feeder who buys steers to fatten has an entirely different credit problem. He expects to pay his notes by the resale of the animals bought. His business is, therefore, commercial and can very well be financed through commercial banks or loan companies.

The purchase of calves to mature as steers on the range is similar to feedlot operations, but it requires a longer time to complete the operation and thus it necessitates some differences in the kind of credit. The initial investment of a ranchman in a bunch of calves is large. Moreover he must carry them the one or two years necessary to bring them to the desirable marketable condition. In the meantime he must pay taxes, labor bills and other similar expenses. It may even be desirable to borrow additional funds on the same cattle rather than make payments on the purchase price.

The present system of six months credit forces the ranchman to resort to one or more renewals if he is to keep the steers the desired length of time. No credit system is entirely satisfactory as long as the loan period is less than the normal turnover of the business. Under such conditions the borrower is

compelled to ask for credit extensions which may or may not be refused regardless of the conditions of the security.

In most respects the grazing and the feeding of steers have credit requirements similar to merchandising. Merchants are few who measure their investments in goods by their own capital. Their purpose is rather to have enough of their own capital to make the banks' security on the goods bought attractive. Credit thus furnishes the bulk of the finance needed for such operations and the capital of the individual serves as the guaranty along with the goods.

The ranchman's or feeder's method of handling a bunch of calves is similar in some respects to the method of the merchant in handling his stock of goods. The goods bought represent the bulk of the security and it is expected that the borrowed money will be repaid out of the resale of the purchased goods. The ranchman or feeder who buys a bunch of steers uses the steers as security and expects to repay his borrowed money out of the resale of the steers.

The differences between the operations of the merchant and the ranchman or feeder lie in the fact that the merchant begins to liquidate immediately whereas the ranchman or feeder usually makes only one sale. The merchant does not expect to add any material value to his stock of goods while the ranchman and feeder expect to add considerable value in growth and flesh to the livestock. Moreover the merchant expects to turn his stock of goods in 30 to 90 days while the feeder can rarely turn his steers under six months and the ranchman anticipates a grazing period of from one to two years.

It is usually considered poor business for the merchant to limit his operations by the amount of his own capital because of the differences in the demand for capital in the slack and rush seasons of the year's business. Likewise the demand of the ranchman or the feeder for capital varies considerably during the turn-over of his business operations. The more usual way of financing the ranchman or feeder is for him to buy the calves or steers with borrowed money and use his own capital to pay operating expenses.

*Amount of Credit*

The fact that ranchmen borrow money is no indication that their business is in bad condition. It merely shows that in ranching as in merchandizing it is good economy to use a certain amount of credit. The ranchman who increases his capital through profit does not necessarily decrease his loans, but like the merchant he may enlarge his business.

According to the 1920 Census, the average value of livestock on a black land farm in Ellis County, Texas, is 4.69 per cent. of the value of all farm property, or \$835.89 per farm. The average value of the livestock on the ranches in Sutton County is \$46,420.38 or 35.61 per cent. of the value of all farm property. If the ranchmen borrow half of the value of this livestock, which surely leaves a wide margin for security, the average sized ranch will use more than \$23,000.00 in livestock loans alone. These figures show how extensively credit may be used in the production of livestock in a ranching section.

The total indebtedness reported on livestock in Sutton County was \$2,173,257.00. The average indebtedness for livestock on all ranches in Sutton County per ranch was \$22,876.00; per section \$1465.00, or the equivalent of \$2.29 per acre. It is equal to \$20.68 per carrying capacity unit on all cattle, sheep and goats in Sutton County.

The average indebtedness on the 68 ranches having indebtedness on livestock studied in Sutton County is \$31,960.00 per ranch; \$1764.87 per section; \$2.76 per acre or \$25.47 per carrying capacity unit. The greatest average indebtedness on livestock for any one group of ranches is the one whose ranches contain four and under eight sections. These ranchmen owe an average of \$30.99 per carrying capacity unit. The lowest indebtedness is \$18.20 in the group of ranches containing 12 and under 20 sections. The greatest percentage of ranchmen in any one group who owe on livestock is 90 per cent. in the group containing 32 sections and above, and the lowest percentage outside of the man with less than one section is 40 per cent. in the one- and under two-section group. The next lowest is 57 per cent. in the eight- and under twelve-section group.

Table 68 shows the number of cattle, sheep and goats on the 68 ranches having indebtedness on livestock.

TABLE 68

Showing the distribution of the 68 ranches whose owners borrow on livestock and the number and classification of the livestock on these ranches.

Groups of Ranches By Sizes	Number of Borrowers	Cattle							Sheep						Goats			
		Bulls	Cows	Calves	Heifers	Steers	'2s	'3s	Rams	Ewes	Lambs	Yearlings	Muttons	Bucks	Does	Muttons	Kids	
Total	68	648	23448	17809	4201	2791	3047	1972	2496	88102	70470	19654	46272	867	37663	32946	30824	
Under 1 section	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1 and under 2 sections	4	38	35	17	0	2	0	0	0	72	89	213	0	23	1654	76	1320	
2 and under 4 sections	4	10	225	196	88	0	53	0	18	932	840	126	125	19	767	230	150	
4 and under 8 sections	18	41	1497	1249	315	20	157	0	240	11935	9970	425	5715	122	4678	5461	4148	
8 and under 12 sections	11	29	1121	931	165	92	630	0	312	11631	9745	1387	2345	198	4274	2949	3685	
12 and under 20 sections	15	119	3428	3076	1004	809	130	63	621	15882	15026	7593	13683	123	5270	7091	4795	
20 and under 32 sections	7	91	2960	2272	376	270	40	4	331	13300	9900	2470	5000	84	4301	4704	3848	
32 sections and above	9	355	14179	10050	2241	1600	2135	1905	974	84350	24900	7441	19404	298	16719	12435	12878	



Table 69 shows the amounts of indebtedness on livestock on the 68 ranches, the carrying capacity units used, the amount of indebtedness per carrying capacity unit and the average size of loans, grouped according to the size of ranches.

TABLE 69

Showing the number of borrowers on livestock in Sutton County, the amount of the loans, the number of carrying capacity units used by all cattle, sheep, and goats of the borrowers, the amount of loans per carrying capacity unit, the average size of loans, grouped according to the size of ranches.

Groups of Ranches By Sizes	Number of Borrowers	Amount of Loans	Carrying Ca- pacity Units used by all Cattle, Sheep, and Goats	Amount of Loan per Carrying Ca- pacity Unit	Average Size of Loans
Total .....	68	\$2,173,257	85,313	\$25.47	\$31,960
Under 1 section .....	0	0	0	0	0
1 and under 2 sections.	4	11,567	413	28.01	2,892
2 and under 4 sections.	4	22,000	860	25.58	5,500
4 and under 8 sections.	18	241,400	7,790	30.99	13,411
8 and under 12 sections	11	172,350	6,706	25.70	15,668
12 and under 20 sections	15	285,702	15,701	18.20	19,047
20 and under 32 sections	7	297,650	10,241	29.14	42,521
32 sections and above..	9	1,142,588	43,629	26.19	126,954

The question arises as to how much credit should be extended a ranchman on his livestock. This depends upon the amount of confidence which the creditor has in the security supported by the livestock mortgage and the man himself. Credit for the purchase of any form of productive capital is based on security. In commerce, security is based primarily upon goods either held in storage for future sale or in transit to market. The amount of money advanced on such goods de-

pendes very largely upon the precautions which are taken to prevent the deterioration or loss of the goods and the probable fluctuations in prices. Security must be real, tangible, attachable and get-at-able.

### *Security*

While in commerce the goods alone may be sufficient, in agricultural production they will not suffice. The security value of goods entering into the process of production must be supplemented by the security afforded by their products and also by the ability, honesty and reliability of the borrower. The creditor must have (1) confidence in the borrower's ability to pay—his business ability—and his unencumbered property and (2) confidence in his willingness to pay.

A livestock loan is based on (1) certain livestock as security, (2) the ability of the borrower as a ranch manager, (3) the per cent. of calf, lamb and kid crop normally secured and the normal death rate of livestock, (4) the location and cost of inspection of the animals, (5) the borrower's facilities for taking the proper care of the livestock, (6) the amount of unencumbered property owned by the borrower and (7) his reputation for honesty and integrity. He must not only maintain a reputation for willingness to pay, but for actually managing his affairs in such a manner that ordinarily he is in position to pay when his obligations fall due. As a rule the greater the amount of confidence and the less the amount of anxiety and doubt inspired among creditors by borrowers, the more readily available is credit and the better the terms upon which loans are secured.

Livestock loans may be made very attractive to creditors and investors if proper precautions are taken to eliminate risk. In this case the creditor has not only the original livestock to secure him, but also the increase in both numbers and weights. The increase in Sutton County is normally not less than 60 per cent. in numbers and 44 per cent. in weights during the first year of the loan and if the increase is kept until two years old the value of the security will be more than doubled. If, however, the livestock is neglected, there is hardly any security which can deteriorate faster.

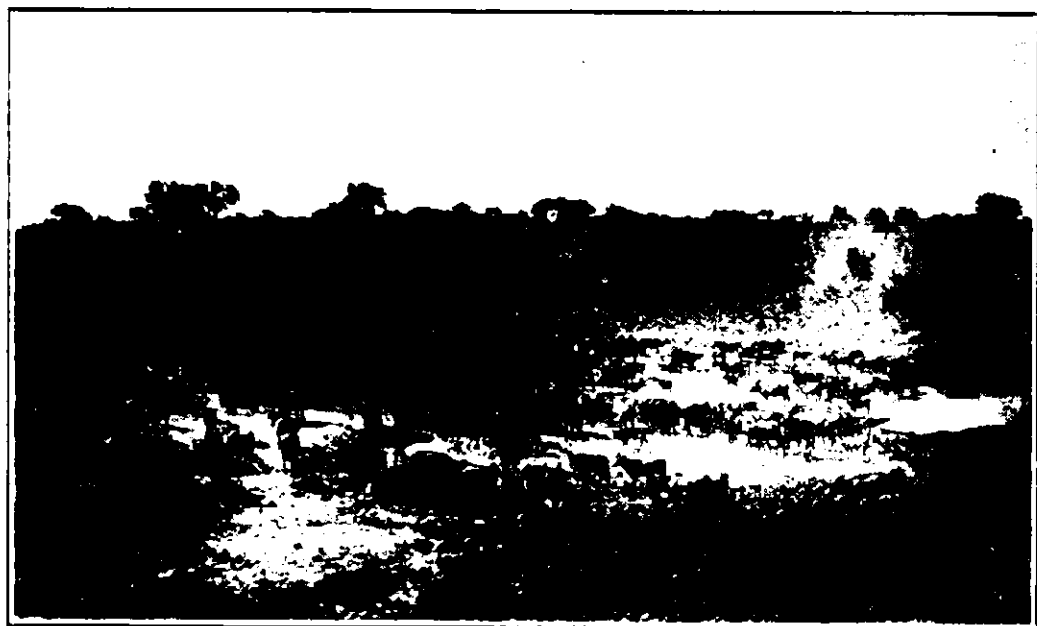


Figure 46. A security that is hard to beat.

It does not follow, however, that because a few men allow their security to deteriorate that this is the rule. The fact is that ordinarily the security increases in value the longer the loan runs, which indicates that the creditor can afford to be very liberal with capable ranchmen. The fact that when one ranchman fails to meet his obligations creates suspicion in the minds of distant creditors, tends to limit the amount of loans, increase the rate of interest and shorten the time of the paper. It would behoove all ranchmen, therefore, to cooperate in the matter of perfecting security and maintaining confidence among creditors. Ranchmen would merely be serving their own interests if they should form local organizations having in view the elimination of risk and the establishment of confidence among creditors.

### *Diversification*

A loan based upon several types of livestock is better secured than one based upon a single type. A disease may play havoc with sheep and goats while cattle are thriving. The prices of wool and mohair may be attractive when those of beef are low or vice-versa. The income of a ranch running cattle, sheep

and goats, therefore, is not only more certain, but better distributed over the entire year than that of a ranch running only one type of livestock such as cattle. Diversified ranching, therefore, tends to improve credit security by stabilizing the entire ranch business and increasing the normal net income.

*Time Required*

The stock-raiser faces a different credit problem from either the feeder or the man who buys cattle or sheep to graze for a season or more before marketing. Let us suppose that a man going into the range stock-raising business secures a loan and buys cows and breeds them. At the end of six months, when his notes fall due, he has nothing to sell. In fact he will have nothing to sell for at least two years. Even then it is unlikely that he will have enough to pay off his loan if it amounts to as much as 50 per cent. of the value of the initial breeding herd. He sells only steers and cull cows and out of the proceeds he must pay his operating expenses. Such a man

LENGTH OF LOANS ON STOCK CATTLE  
SHEEP AND GOATS  
REPORTS OF RANCHMEN IN SUTTON  
COUNTY, TEXAS - 1920.

*Loans on Live Stock Classified by  
Length of Time for Which Made.*

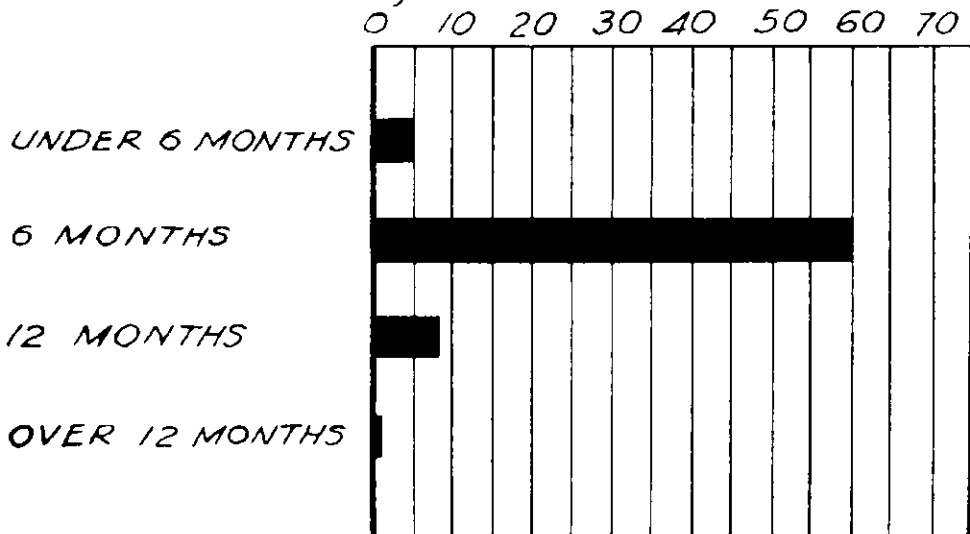


Figure 47. Showing length of loans on stock cattle, sheep and goats.

HOW LONG SHOULD A STOCK CATTLE  
LOAN RUN?  
ANSWERS OF RANCHMEN IN SUTTON  
COUNTY, TEXAS - 1920.

Answers to Question "How Long  
Should a Stock Cattle Loan Run?"  
0 5 10 15 20 25 30 35 40 45

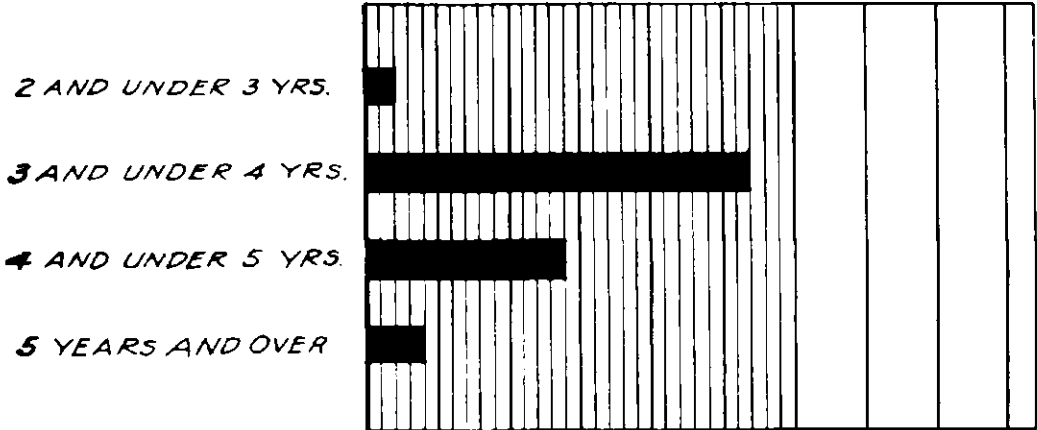
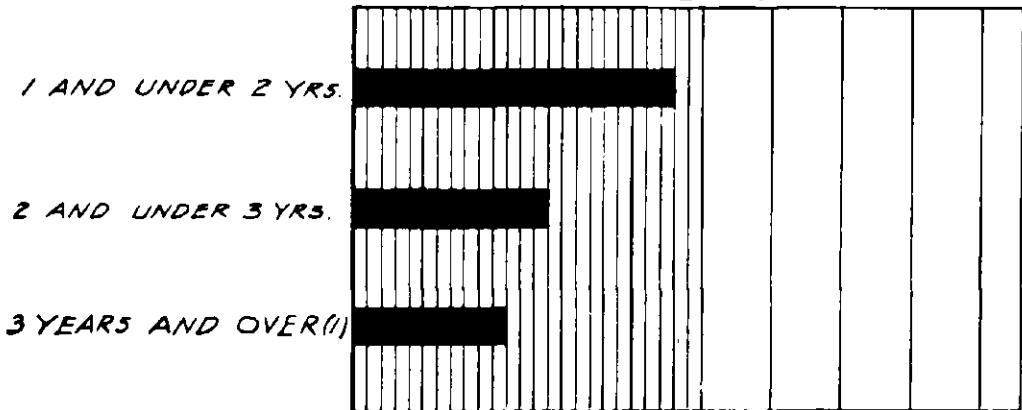


Figure 48. How long should a stock cattle loan run?

HOW LONG SHOULD A LOAN ON STOCK  
SHEEP AND GOATS RUN?  
ANSWERS OF RANCHMEN IN SUTTON  
COUNTY TEXAS - 1920.

Number of Answers.

0 5 10 15 20 25 30 35 40 48



(1) The longest term stated was 5 years

Figure 49. How long should a loan on stock sheep and goats run?

can do no more than pay interest on the loan for the first two years at best. Such loans require three to five years before they can be paid off without disturbing range production.

Figures 47, 48 and 49 show the length of time loans were actually running on stock cattle, sheep and goats in August of 1920, and also the length of time which the ranchmen would like to have them run.

### *Length of Loans*

If the length of the loans were more nearly adapted to the needs of the borrower, creditors would be more conservative in the size of the original loans granted in good times and more liberal in bad times. If they did not loan so liberally in good times, they would have more to lend when times are bad. The method of organization and operation of the present specialized livestock credit machinery has frequently been such as to make the ranchman do just the opposite from what good business policy would dictate.

When times are good and prices high and livestock brisk in demand, creditors make overtures to ranchmen to take on extensive lines of credit. Such conditions encourage the ranchmen to hold their livestock when prices are high, which is just the time they ought to sell. When the range is scant, the demand for livestock is dull and prices take a slump, creditors lose confidence and begin to suggest liquidation if they do not actually demand their money. Thus short-term paper often causes thousands of ranchmen to liquidate at a loss and to find themselves in the unhappy position of being encouraged to buy on high markets and forced to sell on low ones.

In 1919, for example, credit agencies were urging ranchmen to enlarge their borrowings at comparatively low rates of interest. During 1920 and 1921, however, they were asking them to liquidate wherever the livestock serving as security would sell for enough to cover the indebtedness, and thus the ranchmen were forced to secure renewals or extensions often at unreasonably high rates of discount, or commissions for securing the credit.

Attention has already been called to the folly of a ranchman having to renew his notes six or seven times, if not more

in order to complete his business turn-over. Commercial banking and credit institutions are unable, however, to make their paper run more than six months because of certain sound commercial banking regulations. Practically all ranchmen and many leading bankers who are familiar with the intermediate-time credit needs of agriculture, however, are strongly of the opinion that a third and new rediscount banking organization is needed throughout the country to provide credit for a sufficient length of time for agricultural turn-over.

### *Rate of Interest*

The rate of interest on livestock loans varies very little with the size of the loans or of the margin of security. The greater number of the loans are made at 10 per cent. discount. Some loans carry as low as 8 per cent., but the borrowers who have these loans often have to pay a higher rate of interest at each renewal and, in times of depression, many are unable to secure renewals at all.

Stockmen feel that the prices of livestock are too low. They are willing, however, to take desperate chances to save themselves from liquidation at present prices. They have the utmost faith that the industry will come back strong. They feel

### RATES OF DISCOUNT ON THE 77 LIVESTOCK LOANS REPORTED BY THE 67 BORROWERS ON LIVESTOCK ON THE RANCHES STUDIED IN SUTTON COUNTY, TEXAS, 1920.

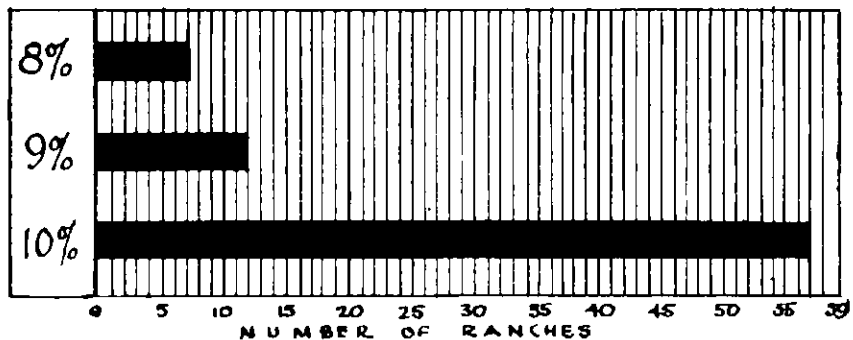


Figure 50.

that if they can hold their breeding stock off the market, they will "grow them out" and meet their obligations. Prompted by these convictions, many men are (in the summer of 1920) taking loans for 60 days' time at 10 per cent. discount and some are paying additional commissions as bonuses.

Figure 50 shows the rate of discounts on livestock loans in Sutton County in the summer of 1920.

Table 70 shows the number of loans on livestock where both the amount of the loan and the rate of interest were stated; loans classified according to the rate of interest and the size of ranches.

The present facilities for supplying credit on range livestock have proved to be inadequate to cope with conditions like the present. They are unable to make the proper discriminations and to get the credit to the man who deserves and needs it *when he needs it*. The chief fault perhaps lies in their inability to distribute credit properly and efficiently. The result is uncertainty and much unnecessary speculation.

There is now (summer in 1920) no dependable market for livestock paper where a man is sure of securing a loan on reasonable terms. If he secures it at all, he has no assurance that the terms will be in proportion to the security offered and the size of the loan demanded. It has almost come to the point that the matter of obtaining a loan is a game of chance. A man whose margin of security is small, but who happens to have a friend who has money, or who knows some one who has, may succeed in getting a loan at a comparatively reasonable rate of interest, while his neighbor who has much better security may not be able to get a loan at all. While the present situation is abnormal, no credit system is adequate which does not make provision for just such conditions.

The lowest rate of interest is obtained by the ranchmen on family sized ranches. All the loans on livestock in the one-section group bear a rate of 10 per cent. All the loans on livestock on ranches containing more than 20 sections bear 10 per cent. interest except one. The lowest percentage of 10 per cent. loans for any group of ranches is the one containing eight and under twelve sections. All the 9 per cent. loans are in the groups that may be classed as the family sized ranches except



TABLE 70

Showing number of loans on livestock where both amount of loan and rate of interest are stated; loans classified according to the rate of interest at which made, and the size of ranches.

Groups of Ranches By Sizes	Number of Ranches Studied	Number of Loans Where Amount and Rate Are Stated	Loans at 10%			Loans at 9%			Loans at 8%		
			Number	Value	Per Cent. of Value of Those Giving Amount and Rate	Number	Value	Per Cent. of Value of Those Giving Amount and Rate	Number	Value	Per Cent. of Value of Those Giving Amount and Rate
Total .....	97	58	48	\$1,408,157	82	7	\$74,000	4	3	\$237,000	14
Under 1 section.....	1	0	0	0	0	0	0	0	0	0	0
1 and under 2 sections .....	10	4	4	11,567	100	0	0	0	0	0	0
2 and under 4 sections .....	5	4	3	18,000	82	1	4,000	18	0	0	0
4 and under 8 sections .....	25	18	16	213,400	91	1	15,000	6	1	7,000	3
8 and under 12 sections .....	19	8	5	75,600	69	2	14,500	13	1	20,000	18
12 and under 20 sections .....	18	13	10	217,602	84	3	40,500	16	0	0	0
20 and under 32 sections .....	9	5	5	229,400	100	0	0	0	0	0	0
32 sections and above .....	10	7	5	642,588	75	0	0	0	1	210,000	25

one large loan. The borrower of this loan has a twelve months obligation which is about to mature. He hopes to be able to renew at 10 per cent. Forty-eight loans at 10 per cent. carry a total indebtedness of \$1,408,157.00. The average sized 10 per cent. loan is \$31,419.00. Ten loans with interest below 10 per cent. carry a total indebtedness of \$311,000.00. The average size of loans with interest under 10 per cent. equals \$31,100.00. If the one big loan in this group be left out of account the average size of loans bearing a rate of interest below 10 per cent. is only \$11,222.00.

Table 71 shows the rates of interest and the number of loans at the different rates, grouped according to the size of loans.

TABLE 71

Showing 58 loans on livestock grouped according to the size of the loans and rate of discount

Amount	Total Number of Loans	Number at 8%	Number at 9%	Number at 10%
Total .....	58	3	7	48
Under \$5,000 .....	12	0	2	10
\$5,000 and under \$10,000 .....	9	1	1	7
\$10,000 and under \$15,000 .....	11	0	1	10
\$15,000 and under \$20,000 .....	5	0	2	3
\$20,000 and under \$30,000 .....	7	1	1	5
\$30,000 and under \$40,000 .....	5	0	0	5
\$40,000 and under \$60,000 .....	2	0	0	2
\$60,000 and under \$100,000 .....	2	0	0	2
\$100,000 and above .....	5	1	0	4

## SOURCES OF CREDIT ON RANGE LIVESTOCK

Loans on range livestock, as has already been shown, are large. The country is sparsely settled and the local banks are widely scattered and relatively small. Because of their size and the other limitations under which they must operate the banks are unable to finance the range livestock business except for current operating expenses. It often happens, as many of the bankers have pointed out, that these banks have the operating accounts of customers who borrow elsewhere in single loans more than the capital and surplus combined of the local bank. Out of 58 loans on which the size was reported there are 21 for \$20,000.00 and over; seven for \$60,000.00 and over; and five for \$100,000.00 and over.

Private individuals furnished but a small amount of the loans on livestock. In fact only three ranchmen were found who depended upon private individuals for livestock credit.

*Cattle Loan Companies*

It was to meet these conditions that cattle loan companies were organized. As a rule, they are organized in connection with a bank and where the business is not very large, the officials of the bank may run the cattle loan company. These cattle loan companies were organized to function where the small village or country banks could not, because of their size. The cattle loan company offers the producers of range livestock an opportunity to secure loans which cannot be secured through the ordinary local banking channels.

The cattle loan company is an organization with capital stock and a charter to do business. It does not receive deposits and, therefore, is not a bank. Its primary purpose is the making of loans on range livestock for rediscount.

The cattle loan company has two divisions in its organization. On the one side it is a loan-making agency. It has a force whose business it is to secure loans. The essential agents on this side of the business are those who make the loans and inspect the security. The essential factors in the other division of the business are security salesmen. These men are supposed to sell to bankers or the public the securities of the ranch-

men at a discount which will enable the cattle loan companies to make a margin of profit on the difference between what they charge the ranchmen and what investors charge them as a discount rate. The cattle loan company is essentially a middle-man type of business.

The cattle loan company is primarily a risk-taking organization. The capital stock of a cattle loan company serves as a guarantee for the security of those who buy the mortgages taken by the company from the ranchmen. The capital stock may not necessarily be in the form of banking capital. The essentials are that it be safe and comparatively easy to liquidate.

No cattle loan company expects to hold any very large portion of the amount of loans it makes. One of the cattle loan companies says, "The profits of the cattle loan company are the margin between the rate of interest at which the cattle raisers negotiate the loan, and the rate at which it is rediscounted. It must be understood that, as a rule, the stock-raiser's note is not held until it matures, but it is rediscounted at a profit. If we attempted to hold all of our loans our operations, too, would be hampered and our profits limited by our capitalization. On the other hand, by rediscounting our loans, we can turn over our capital time and time again. The number of turn-overs is only limited by the demand for money."

In rediscounting their loans, the cattle loan companies depend very largely on their reputation and the size of their capital and surplus as a guarantee to the eastern banker. In rediscounting mortgages on range livestock, however, they often send not only the notes and mortgages, but the reports of the inspectors as well. The better cattle loan companies, if they make a bad loan, do not invariably report such fact to the agency which has discounted their paper. They often pay interest where the ranchman has failed to pay. The attractiveness of their collateral as investments for bankers desiring liquid investments depends very largely upon the promptness with which they meet their obligations. Cattle loan companies, therefore, take it upon themselves to pay promptly all obligations even though they themselves have not realized on the mortgages.

It may happen that ranchmen themselves furnish a good part of the capital for small cattle loan companies. Where they do furnish such capital, they often borrow it back in the form of loans. Where such an organization is formed primarily by ranchmen for their own benefit it is a method of cooperative borrowing. If one hundred ranchmen were to go together and put in one thousand dollars each as capital stock in a cattle loan company and then borrow twenty thousand apiece through the company in the form of rediscounts from investors, it would be a cooperative cattle loan company in operation. At the present time the big cattle loan companies are not cooperative, but are organized for profit. As a rule they are owned and operated by bankers.

In order to function properly the cattle loan company must be large enough to minimize risks and cut to the minimum the cost of operation. The big cattle loan companies so far organized are located very largely in the great cattle marketing centers.

Cattle loans of any particular locality are usually all made to mature at about the same time. Cattlemen who expect to obtain loans either notify the company direct or apply through their local banker. Arrangements are made for an inspector to come to the locality and make an examination of the securities offered. The ranchmen tender an application for the loan which includes a description of the livestock offered as security, a statement as to the amount of land owned or leased, the condition of the range and a financial statement. These financial statements are often verified by the local banker. The inspector sent out by the loan company is supposed not only to examine and count the stock offered as security, but also to look up the financial standing of the intending borrower and get a general estimate of the man's ability and disposition to handle his property well and to pay his debts.

If the man has a reputation for honesty in paying his debts and for ability in handling stock, he can usually secure a loan. On the other hand, the individual who shows a disposition to take advantage of technicalities to avoid the payment of a loan or shows little ability in the management of livestock, has difficulty in making a loan even though he has

considerable property. Usually the man who has the backing of the local banker is able to secure a loan.

The spread between the rate of interest charged the ranchmen and the rate at which the cattle loan company discounts a ranchman's note varies from one to as high as three or four per cent. Perhaps two or two-and-one-half per cent. would be an average. The loan companies say that it costs from one to one-and-one-half per cent. to handle the loans. The cost of making small loans is almost as great as that of the larger ones because the same amount of routine is gone through in both cases. For this reason it is practically impossible for the big loan companies operating at a distance to make loans for less than \$2,000.00 to \$3,000.00 and make expenses on them even though they secure a margin of as much as three per cent. These companies, therefore, solicit the medium to large loans. The average loans made on livestock are around \$23,000.00.

The cattle loan company has thus become a big factor in mobilizing credit to be used in financing the range livestock business. It is thus performing a function that was not being performed otherwise and which could not be performed by the banks under the present banking laws. The cattle loan companies have thus rendered an immense service to the range livestock industry. If they are to continue in the business and are to render the greatest possible service to the livestock industry, however, there should be created a National intermediate-time rediscounting agency with the loan companies or associations as members.

## CREDIT ON WOOL AND MOHAIR

Credit on wool and mohair is a very important consideration for the ranchmen who grow comparatively large numbers of sheep and goats. Reports were obtained from 85 ranchmen relative to their use of wool and mohair as the basis of credit. Nineteen out of the 85 do not as a rule borrow on wool and mohair. Sixty-six, however, use them as a basis of a line of credit. Most of those who do not borrow on wool and mohair, have such a small amount that it does not pay to take the trouble to secure the loans.

The amount of money advanced on wool and mohair depends upon prices, the financial standing of the borrower and his ability to secure the good will of the lending officials. Fifteen of the 66 who ordinarily get loans on wool and mohair are unable to get loans now (August, 1920). Four of the 53 ranchmen reporting say that ordinarily they can not borrow over 25 per cent. of the market price of their wool and mohair; 27 say that they can borrow 50 per cent. and 22 say they are able to borrow about 75 per cent.

The length of time of the loans on wool and mohair varies greatly. The character of the obligation likewise varies widely. Many of the ranchmen, especially the smaller ones, sign a demand note which may be called at any time, but which is supposed to run until the wool and mohair are sold. Forty-five of the 56 ranchmen reporting on this subject say that their loans are not called until the wool and mohair are sold regardless of any time written in the notes. At the time of sale, the wool company which holds the notes deducts all charges of whatsoever nature and forwards the ranchman the difference as his net proceeds. Sometimes an itemized statement is furnished with the remittance and sometimes it is not.

There are 11 ranchmen who make notes for a definite time, usually from three to six months. These notes are then discounted by or through the commission company. At present six loans are drawn for three months and five for six months.

The rate of interest on loans made against warehouse receipts on wool and mohair varies from 6 to 10 per cent. Of the 35 ranchmen who reported the rate of interest on loans against wool and mohair, one said he usually paid 6 per cent., 26 said the usual rate was 8 per cent., nine said 9 per cent. and 19 said 10 per cent. All who are making loans at the present time are paying 10 per cent.

The wool storage companies have three main motives in organizing to lend money. (1) It helps their commission and storage business because the borrower signs a contract to deliver his wool to the commission house for storage and sale, or to pay the commission even though the wool is sold through other channels. (2) It builds up the sheep business by provid-

ing funds for its expansion. (3) It enables them to realize a substantial commission for providing the credit.

Wool consigned and delivered to a standard fireproof bonded warehouse offers an excellent basis for commercial credit. The loans are made to the ranchmen on condition that they consign their wool to the company with all rights of sale and the privilege of paying all loans and commissions out of the proceeds. The wool company can deliver the notes and warehouse receipts to rediscount banks and obtain the desired credit. The fact that risk is virtually eliminated, makes the rate of interest depend on the volume of credit and the minimum earning power of money.

Many of the wool storage companies organize with capital stock and perform the same functions for the sheep industry that the cattle loan companies do for the cattle raisers. They are able to finance sheep and goat raisers not only on the basis of delivered wool and mohair, but are also in a position to discount their livestock paper. These notes when properly indorsed are eligible for rediscount at Federal Reserve Banks. The wool storage companies are as a rule strictly middleman agencies not only in the sale of wool, but also in furnishing credit.

### CREDIT ON RANCH MACHINERY

Credit on movable capital other than livestock is a comparatively negligible matter in Sutton County. The total value of all items like automobiles, trucks, saddles and farm machinery and implements is estimated to be about \$137,840.00 on the 97 ranches studied or about \$1441.65 per ranch. This represents an investment of \$93.41 per section or about 14 cents per acre on the 1504 sections of land. Most of this equipment is bought for cash. That which is bought on credit is usually on the basis of an open account. The few cases observed show that the length of time such loans run varies widely depending mainly on the seasons and the price of livestock. The rate of interest on such loans studied is 10 per cent. Merchants interviewed in Sonora and San Angelo are charging 10 per cent. interest on accounts which have been running more than



60 days. The dealers interviewed in this section of the country do not make a difference in price between the cash and time sales. It is not known just how much higher if any prices are because of the credit extended. The losses due to bad debts ordinarily are not great. The estimates of merchants range from one to two per cent. on this class of goods.

### CREDIT FOR OPERATING EXPENSES

The ranchmen require comparatively large amounts of money to pay operating expenses. The income on most ranches is at best semi-annual and on some ranches, especially strictly cattle ranches, it is annual. The average ranchman pays out each year about \$800.00 for wages. It is necessary also for the ranchman to buy considerable medicine. The average automobile repairs, gasoline, feed, food and clothing bills count well over \$1000.00 a year. In addition to the above expenses, the ranchman must buy a certain amount of repairs and have other miscellaneous expenses. These services and materials are obtained very largely on the basis of some sort of credit. Expenses for labor and many miscellaneous bills are paid out of cash borrowed from the local bank. Feed, food and clothing, however, are often bought from the local merchants on book credit.

Bank loans for operating expenses are obtained by means of promissory notes of ranchmen often without collateral or indorsement. There are always some men, however, who must either have indorsers or give substantial security to obtain credit.

The rate of interest on operating expense loans at the bank is almost invariably 10 per cent. discount. The notes are drawn for six months or less time.

No adequate figures were obtained on the cost of store credit. It is the custom with most of the stores to make no extra charge until after the expiration of 60 days. If the account is not paid then, merchants charge 10 per cent. interest as a carrying charge. This charge certainly is not excessive for all the merchants and other business people in Sonora say

that they have to pay 10 per cent. interest on the money they borrow.

The losses due to bad debts are given as from one to five per cent. of sales. The most usual figures given are one and two per cent. The merchants cover their losses with a higher price for their goods. It is evident, therefore, that bank credit is cheaper than past-60-days store credit if the merchants make any difference between cash and credit prices. There are some who are able to secure store credit who would have difficulty in getting bank credit, and they follow the line of least resistance.

The amount of operating credit in force and the length of time it runs vary widely from time to time. According to the estimates of the merchants of Sonora, there is about three hundred thousand dollars worth of business done on a basis of 60-day credit. It is impossible to analyze this credit relative to the amount received by ranchmen and that received by villagers. The merchants say, however, that most of the credit running more than 60 days is to ranchmen.

The trade territory of Sonora is approximately the size of Sutton County, but does not correspond to county boundaries. No reliable estimates can be made of the amount of more than 60-day credit per ranch. The merchants themselves say that it is more than one thousand dollars per ranchman, however, on an average.

Many of the ranchmen buy their salt, feed and important hardware at either San Angelo or Menard. These articles represent the big items in the ranchman's expense budget. No information was obtained as to the amount of credit required for these purposes.

## SUMMARY AND CONCLUSIONS

The credit of a ranch country is closely related to and affected by international business conditions. The money centers which have easy access to securities of all nations furnish a large part of the credit on range livestock by rediscounting notes discounted by local banks and cattle loan companies. The fact that the ranch country must import so much of its credit

such a long distance under adverse conditions, accounts for many of the perplexing problems in ranch finance.

The ranch country is comparatively new. Its productiveness is not generally known, particularly to distant creditors. It is known that there are millions of acres in the West which are little more than desert land. Few of the lending people know just where these barren acres leave off and where the grazing lands begin. They are accordingly more or less suspicious of every loan. Perhaps the majority of investors in ranch securities have not seen the country at all and most of those who have seen it have gotten their views from car windows. The investors, therefore, require the services of some risk-taking agency of strength and reputation in placing their money.

The credit facilities of the ranching sections would undoubtedly be greater if the carrying capacity were more definitely known. The country is sparsely settled. The improvements in the way of buildings, watering equipment and fences are often inadequate. These facts give the impression of instability and insecurity. Even in sections like Sutton County where productive equipment is better than the average, the ranchmen do not get as much credit on as desirable terms as they deserve because not enough is known of their developments. They are simply rated along with the rest. It takes time and effort to differentiate the merits of different regions in the way of security for investments.

The ranch business was formerly conducted on land suitable for agriculture. The early ranchmen got in the habit of grazing a place a few years and then moving on when the area was opened for settlement. They followed free grass. Theirs was a policy of exploitation which frequently resulted in overgrazing and much loss. Modern ranching has or is developing a system of permanent grazing which has done much to stabilize the business, but which has not yet been appreciated by the investing public. The ranch country, therefore, can improve its credit rating by judicious advertising.

The Great West has attracted a variety of people. As a rule they have been both venturesome and resourceful. In the early stages, the population was comparatively unstable. Many

have been soldiers of fortune willing to take any sort of plunge in the hope of "striking it rich." Many of them have been eager to borrow to the limit in the hope of making a "big killing" as they express it. The credit system in its present form often encourages such adventures.

The ranch country is usually the farthest from the investing centers and distance is a big factor in the movement of capital. It is frequently said that capital is timid, that it hesitates to move and especially into unfamiliar regions and types of business. The investors really know very little about the value of range livestock security. They have no adequate knowledge as to its degree of safety, the length of the livestock loan turn-over or any one of a large number of other important factors affecting the desirability of livestock loans as an investment.

The investors know very little of the value of individual loans. They have no way of knowing. They are not concerned with the length of turn-over in the livestock business. They are not as a rule seriously concerned with the fact that loans for the purpose of producing livestock come under the form of investment loans and that a loan on steers for feeding or grazing purposes is a commercial loan.

The following quotation from an official of a big Eastern bank which has been one of the most liberal purchasers of range livestock loans, summarizes admirably the faults of range livestock loans as the investors in the East see them:

"The large problems relating to financing the livestock industry have been with us always. There is nothing new about it and the metropolitan banks of the country are well alive to the importance of this matter as relating to the economic welfare of the country no less than the direct interests of the livestock producers. The combined wisdom of the country has thus far been able to develop no more satisfactory machinery than the cattle loan companies specializing in this line of business and supplementing the primary machinery of the local banks. The cattle loan business is a highly complicated and technical one, involving perishable security of great varieties in age, quality and condition, in which the livestock is in the custody of the borrower and is subject to great fluctuations of market

value, hazards of drouth, winter weather, uncertain conditions of water and pasturage and the prices of feed, conditions of transportation, risks of rascality, and the complications of the varying laws of many states. It is a business in which the borrowers as a rule have insufficient capital for margining their loan requirements and also it involves as you correctly state long-time financing in connection with stock cattle operations, which loans are not desirable as bank investments for the reason that they do not liquidate naturally within such periods as commercial banks can conservatively lend their funds, unless such liquidation in case of need is effected by foreclosure and sacrifice destructive to the interests of all concerned."

It is impossible for the ranchman unaided to sell his security in the money market. The distance from the ranch to the money market and the risks and uncertainties mentioned above make it necessary to have an organization which is financially strong and reliable enough to command the confidence of the investors. Moreover such an institution or association must be big enough to eliminate risk and to minimize the distance with the volume of the business. The cattle loan companies are the specialized agencies which perform these services at the present time. They conduct that type of business which they believe will give them the greatest net gains and which may or may not be to the best interest of the ranchmen.

#### *Proposed Remedies for Faults of Present System of Ranch Credits*

No business may expect to be adequately financed as long as it is predominantly in the speculative stage or thought to be in that stage. In order to avoid paying the penalty of a loose method of business, ranchmen must put their business on a sound basis and show the world that they have done so. Ranchmen must get away from the old exploitation practices and build up a system of permanent grazing. They must organize their business to make it yield a dependable income.

Ranchmen in Sutton County have made rapid strides in putting ranching on such a basis. They have diversified their livestock, provided an abundance of pure water and have fenced

their ranches with wolf-proof fences into pastures which enable them to practice the best methods of grazing and livestock management. They must let the world know what they are doing.

Credit must be earned if it is to accomplish the object for which it was designed. Unearned credit is like unearned money—it refuses to stay in the hands of the possessors. Credit is earned when the borrower puts up securities the safety of which is beyond question, when it is in a form which meets the needs of the lender, when the borrower pays a rate of interest in proportion to the desirableness of his security to the investors and when the borrower meets every obligation and is careful to keep the security unimpaired.

One of the most effective ways of increasing the strength of the livestock loan security is to combine a great many loans. In any line of business, there are a few loans badly placed. Where a business is essentially sound the massing of large numbers of loans tends to eliminate risks and makes possible losses calculable. If it is known, for example, that one \$1000.00-loan is bad out of one thousand such loans, the individual who buys only one runs the chance of losing all his money invested and if he buys two he runs the risk of losing only half of it, but the man who buys the whole lot could not lose more than one one-thousandth of his investment which is a negligible loss. The man who buys them all could eliminate his risk entirely by simply paying \$999.00 for each loan, a very light discount.

The vital points in an efficient range livestock credit system are few and easily understood. (1) Care must be taken that the loan is based on good security. (2) The proceeds of the loan must be spent productively. (3) The security must not be permitted to deteriorate. (4) The loans must be pooled in such a way that they eliminate risk and cut to the minimum the cost of operation.

The way the cattle loan companies handle these problems, has already been described. The question arises, "Can the present methods of the loan companies be improved upon either by themselves or ranchmen organizing and operating their own agencies, by a combination of the two or by some form of government rediscounting agency for either or for both?"

If the present abnormal conditions are left out of account, it may be said that cattle loan companies have been standardizing their business and improving their service to the ranchmen. They have men who are experts in passing on livestock security. Their inspection service is being improved and they are developing good will with both ranchmen on the one hand and rediscounting agencies on the other. These improvements are tending to make operating expenses lower and these advantages should be passed on in part at least to the ranchmen. Unfortunately, however, the competition among these companies for the ranchmen's business has a tendency to raise costs. The chief difficulty with the present loan agencies is the fact that they must rediscount their paper through commercial banking institutions. They must handle livestock loans as though they were commercial loans when, instead, they are intermediate-time investment loans.

#### *Essential Requirements of an Intermediate-Time Credit System*

The function of supplying intermediate-time credit, therefore, belongs essentially to some form of investment banking. The breeding stock purchased with the credit of a ranchman is consumed in the process of stock-raising within the period of four to six years. The loans on this stock must be repaid out of the sale of the increase rather than the resale of the initial stock. Loans for such purposes require specialized banking machinery if they are to be handled in the manner most satisfactory to the borrower. Short-time liquidations required in deposit banking are wholly unsuited to the intermediate-time credit requirements of ranchmen. In similar manner the Federal Land Banks are unsuited to supply intermediate-time credits. Their long turn-over falls as far short of synchronizing with intermediate-time credit requirements as that of commercial banking institutions.

*Central Discounting Institutions:* Any form of investment banking must secure the funds necessary to carry on its business by the sale of bonds, the length of which must correspond to the turn-over of the enterprise being financed. In the case

of intermediate-time credits, the debentures issued in lieu of the notes discounted should run from one to five years.

The efficiency of any sort of bond-issuing institution depends very largely upon its size and business record. The size is measured in terms of paid-in capital stock and unimpaired surplus. It is evident, therefore, that the central discounting agent or agencies should be large.

The central discounting agencies must be located as nearly as possible in the center where their bonds are most greatly in demand. They must reach the individual borrower through some responsible local organization.

*Local Guarantee Associations:* The local organization which makes the loans to the producers is the vital unit in the system. This local organization may be a private corporation, a joint stock company or a cooperative agency. Since, as has been pointed out, the thing for which the loan was made to purchase is more or less unattachable when once the productive process has been started, the security must cover the product of the thing bought as well as the thing itself and, in addition, a further guarantee must exist to cover the personal risk involved. The property risks are covered by a mortgage and the personal risks are covered by the capital stock and surplus of the local organization. Modern cattle loan companies are fair examples of the essential characteristics of such organizations.

The corporate cattle loan company could be turned into a cooperative one by the borrowers subscribing the capital stock, managing it through a board of directors and dividing profits on the basis of patronage. At the present time there would doubtless be a place for all three forms of local organizations. In each case, the local bank might serve as the nucleus of the organization and the officers of the bank might well be the officers of the local organization.

*Regional Discount Agency:* In some instances, it may be desirable to have a regional discount agency that serves as a link between the local organization and the central discounting institution. The position of the Fort Worth Live Stock and Agricultural Loan Agency in transferring credit from the War Finance Corporation to the local bank is a good example of the function of such an institution.



*Recent Proposals for Furnishing Agricultural  
Intermediate-Time Credit*

The proposal of the Joint Commission of Agricultural Inquiry is that a separate department be organized in connection with the Federal Land Banks to undertake the handling of intermediate-time agricultural credits. When the differences between intermediate-time and long-time credits are considered, it is difficult to see any well founded reason why a Federal Land Bank should be called upon to handle intermediate-time credits. In fact the two types of credit are so different that the machinery required for handling them would have to be entirely separate. It would thus appear that putting the two systems together might cause one or the other to suffer in efficiency, and both might suffer.

It is of course possible for the intermediate-time credit institution to be created as an independent unit of the Federal Land Bank system. Some overhead expense might be saved, for example, by the use of the facilities owned by it, but the rediscounts, the bonds and the capital stock should be entirely independent of the Land Bank proper. Similarly, economies might result from the Land Bank officials handling the business of the intermediate-time credit institution.

*Longer Time on Agricultural Loans Granted by Federal Reserve Banks:* Some people have argued that the Federal Reserve Banks should grant twelve months credit to agriculture. When the limitations of deposit banking for making long-time credits are considered and it is further recognized that even the twelve months time does not meet the immediate-time demand of agriculture, it is believed that such a modification would be detrimental both to the best interests of the Federal Reserve system and of agriculture.

Loans for the purchase of breeding stock and ranching machinery on six to twelve months credit are not long enough for the ranchmen to put the capital into their business and get returns sufficient to repay the loans. Since the length of the loan does not correspond to the turn-over of the business, the borrowing of such capital from the Federal Reserve and other commercial banks not only hampers the ranchman's enterprises,

but jeopardizes the solvency of the commercial institutions. The evils of frozen loans in times of crises will exist as long as deposit banks continue to make what are essentially intermediate-time investment loans. The importance of this fact is illustrated by the large number of failures of commercial banking institutions in agricultural regions during 1920 and 1921.

*Conversion of the War Finance Corporation Into a Permanent Intermediate-Time Credit Institution:* It has been proposed that the War Finance Corporation be reorganized and converted into a permanent institution for furnishing intermediate-time credit. The fact that it will take several years for the Corporation to wind up its loan renewals even though it makes no more new loans after July, and the further fact that it has already created machinery for making loans, are strong points in favor of making it the center of the intermediate-time credit system. Moreover the Corporation has been successful in its efforts to relieve the embarrassing credit situation in which agriculture found itself in 1920.

Whether some existing institution is modified to meet the needs of intermediate-time credit or an entirely new organization is set up, is merely a matter of policy. In either case it is a means to an end. The main object should be to supply the much needed credit facilities in accordance with the principles of both sound banking and sound farming and ranching principles. Indeed, those engaged in agricultural production have a right to demand that such credit facilities be provided.

## CHAPTER XII

### RANCH LABOR

#### *Regular Labor*

Ranch labor differs in some essentials from farm labor. Ranching requires less labor per acre, per head of livestock kept or per unit of product, but more per average sized holding than farming. According to the Census figures of January 1, 1920, there was an average of 1.7 laborers per farm in the United States. The average number of adult laborers, including managers employed by the year, per ranch on the 97 ranches studied in Sutton County in the summer of 1920, was 2.9 men. The number of regular hired men per ranch averaged two. The ranches containing 20 sections and above employed annually an average of 7.1 regular hired hands per ranch, managers included. The average number of hired men working regularly on the ranches containing 32 sections and above was 9.6. The greatest number of hired men working regularly on any one ranch was 25.

#### *Seasonal Labor*

The amount of seasonal labor, labor for special jobs like shearing and kidding, required on a ranch is much more than the total hired labor required on the average farm in Texas. Virtually every ranchman of the 97 ranches studied hires some extra help during the year. Seventy of the ranchmen report that they depend on extra help for jobs like shearing, kidding, lambing and farming. The average number of seasonal laborers employed on these ranches is 2.7. One hundred and twenty-two of the 192 extra laborers reported are hired to do ranch work, 14 for farm work and 56 are all-purpose hands.

Many ranches in the area studied conduct small farming enterprises as a sort of side-line to their main business. As a rule farm labor must be hired separately from ranch labor. It is said that the quickest way to "fire" a regular ranch hand is to tell him to go to plowing.

Table 72 shows the numbers and distribution of all laborers on the 97 ranches studied in Sutton County.

TABLE 72

Showing the number and distribution of all laborers on the 97 ranches studied in Sutton County

Groups of Ranches By Sizes	Number of Ranches Studied	Total Hands Reported	Number of Hands Hired Regularly by Operators	Number of Extra Hands When Want- ed by Opera- tors
Total .....	97	388	196	192
Under 1 section .....	1	4	0	4
1 and under 2 sections ...	10	2	0	2
2 and under 4 sections ...	5	3	1	2
4 and under 8 sections ...	25	37	11	26
8 and under 12 sections ..	19	52	21	31
12 and under 20 sections..	18	28	28	0
20 and under 32 sections.	9	92	39	53
32 sections and above ...	10	170	96	74

### *The Amount of Labor*

The amount of labor per ranch in the area studied tends to vary directly with the size of the ranch, but the amount per acre tends to vary inversely with the size of the ranch. There are 282 full-time adult laborers on the 97 ranches studied in Sutton County. Eighty-six of these are the owners, part owners and tenants who make full hands at ranch work and the remainder, 196 in number, are men who are expected to work twelve months in the year. There is an average of one full-time laborer to each 5.3 sections of land. The smallest number of sections per man is in the group of one-section ranches. There is an average of one man per section in this group. The group showing the greatest number of sections per man is the one containing 32 sections and above. A man in this group handles an average of 6.4 sections.

Table 73 shows the number of grown men employed regularly on the 97 ranches studied, the average number per

ranch and the average number of sections per man in the different sized groups.

TABLE 73

Showing number of grown men laboring continuously on the ranches studied in Sutton County

Groups of Ranches By Sizes	Number of Ranches Studied	Number of Grown Men Laborers	Average Number per Ranch	Average Sections Operated per Man
Total .....	97	282	2.9	5.3
Under 1 section .....	1	1	1.0	1.0
1 and under 2 sections ....	10	10	1.0	1.0
2 and under 4 sections.....	5	6	1.2	2.0
4 and under 8 sections ...	25	33	1.3	4.3
8 and under 12 sections ...	19	39	2.0	4.6
12 and under 20 sections...	18	42	2.3	6.1
20 and under 32 sections ..	9	46	5.1	4.9
32 sections and above ....	10	105	10.5	6.4

### *Kinds of Labor*

Not only do modern ranches require more labor than is required on modern farms, but they require greater specialization of labor. The labor on a modern ranch may be divided into regular ranch hands, ranch hands for special occasions and farm hands.

The regular hands are divided into classes according to the work they perform. The more important classes are overseers, cowboys, shepherds and general laborers. Any classification of ranch hands must necessarily vary from one region to another and from one ranch to another in the same region, depending upon the size of the ranches and the types of animals grazed.

*Ranch Labor in Fiction*

In the minds of most people, the cowboy represents all types of ranch labor. To them he is the novel creature who has been so frequently pictured riding out of the great unknown, clothed in the garb of a big hat, tall boots with huge, jangling spurs and armed with all the weapons of western warfare. He is pictured as riding into town at top speed, yelling like a Comanche Indian and waving and shooting a long revolver. After he has "tanked up" and sent all the townspeople quaking to their beds, he spends the rest of the night at a game of poker. The scene is closed by his killing a man or two and disappearing with the dawn as mysteriously as he came at dusk.

It is the custom of the novel to add the necessary romance to the scene by sending the young adventurer out from away back East because of an intrepid spirit that either makes him dissatisfied with his native haunts or more often forces him into exile through some boyish escapade. In his calm hours he is pictured as a very generous creature and a very skillful horseman. He is reserved in the presence of ladies, but at the crucial test becomes very chivalrous and obliging.

The picture is drawn to represent the extreme, but it nevertheless suggests some of the characteristics of ranch labor of former days. The arm of the law was too far away and too weak to afford efficient protection to the rightful business of honest men. Because of these conditions the ranch hand performed two essentially different services for his "boss." It was his duty to look after the physical welfare of the livestock and to protect his employer's interest in the great round-ups where cattle were sorted and branded. Many disputed points inevitably came up over the ownership of cattle at such times which too often had to be settled with force.

In those early days, ranch hands were selected purely upon their merit to perform the necessary functions of ranching. When a man rode up to a ranch headquarters and asked for work he was never asked for a recommendation. If the ranchman wanted a hand, he forthwith began to put the applicant to the essential tests necessary to reveal his qualifications as an efficient ranch hand. The first trial was that of horseman-

ship. The worst horse in the herd was picked out for this purpose. If the applicant rode him it was a sufficient indication that he could rope, brand or do any one of the many jobs required on a ranch.

The ability to ride and to care for cattle, however, was not the only qualification necessary for a good ranch hand in those times. It too often happened that well qualified men were thieves or trouble-makers. Hence the character and disposition of the man had to be tested. This test was applied in many different ways.

The ranch country carried its own code of ethics both as to the relation of the employee to the employer and the relations of the employees among themselves. If the applicant measured up to the requirements it was understood that he could stay on the ranch. If he did not, it was equally as well understood that he must go. If he could satisfy the next man to whom he applied for work his past experiences did not count. The experienced ranch hand who was sure of himself enjoyed such experiences. He often posed as a "tenderfoot" just for the pleasure of outwitting the men who were trying him out.

### *Ranch Labor Today*

Conditions in the ranch country have changed. The frontier in the old sense has disappeared. The ranchmen no longer have to be the law unto themselves. The menace of the Indians, who were ever ready to swoop down on them and destroy their property, has long since disappeared. Cattle stealing as a business has likewise gone and the sporadic cases of theft which now occur may be easily dealt with by the hands of the law.

While the "blood and thunder" of the old days has disappeared, the same type of men go west—go to the ranches to get work. The cowboy of today does not ride into town to shoot it up, but that is no sign he has lost his spirit. It simply means that he is ready to play the game according to rules. The spirit of "Get ahead if you can, but play the game fair and give every man a chance" is still the fundamental principle governing relations among men in the ranch country.

The cowboy is usually a self-reliant man. Several generations of natural selection have helped to give him this inde-

pendent spirit. He usually works alone and under conditions which force him to make and act on his own decision. The very fact that ranching has been a frontier industry conducted on very cheap if not free grass, has always made it possible for the ranch hand to go into business on his own account sooner or later if he had the ability and the desire.

The amount of skill demanded of the efficient ranch hand is more than that of the average farm hand. The cowboy lives very largely upon a horse, and certain conditions demand hard riding. How much can the horse stand without injury and how can he tell when the horse has reached his limit? Occasionally he must throw steers or do some other work requiring unusual strength and skill. The cowboy must know accurately what his horse can do under such circumstances and what must be done. He must not only understand the nature of horses, but he must have sympathy for them.

The primary business of a ranch hand today is to look after the welfare of cattle and other range livestock. He must understand them so well that he can interpret the least movement or expression of theirs in terms of contemplated action and know how to avert that action if desired. He must not only understand them, but he must be able to make them understand him. The ranchman may decide, for example, that the sheep and goats in the five-section pasture on the north must be driven in, dipped and changed to another pasture. The livestock, of course, might be at any place on those five sections. The inexperienced man would doubtless start out and ride more or less indiscriminately until he came upon the animals. If he is a real ranch hand he is wiser than that.

The action of the efficient ranch hand under circumstances is governed by many different circumstances. He takes, for example, a look at the weather, giving particular attention to the direction and strength of the wind and couples that with his knowledge of the topography and cover of the pasture and decides that the sheep and goats are in the extreme northeastern part of the pasture and rides directly to them. How did he know? He knew that a rain a few days previously had filled certain water holes and that the animals had most likely gone to them. He also knew that the livestock was grazing against



the light breeze from the north and that the animals with their accustomed rate of movement had just about reached the place he had in mind. Other circumstances would naturally demand other interpretations, but under any circumstances the efficient ranch hand will be able to avoid serious mistakes.



Figure 51. Ranch hands at work. Upper left: Dragging out calves. "Going down the Rope."  
 Upper right: Marking and branding calves.  
 Lower left: "Flanking."  
 Lower right: Driving a herd to market.

(Photographs 1, 2, and 3, courtesy R. A. Oliviera)

### *Source of Supply of Labor*

Until recent times, most of the labor in the ranch country was imported, but the number of ranch hands who have been raised in the community is now increasing rapidly in Sutton County. The places of birth of 63 of the ranch hands regularly employed were reported. Seventeen of the 63 were born in Sutton County and 46 were born outside of the county. These figures do not represent the true ratio of those born in the county to the total labor supply, for when the ranch owner or operator is unable to tell the birthplace of his laborers, it is good evidence that they were not born in the county. As the

ranches more nearly approach the family size, probably there will be less demand for imported labor.

Now that ranges are fenced and all range animals are being handled more quietly, the job of the ranch hand is being rapidly changed from breaking wild horses and roping cattle to one demanding a thorough appreciation of the different types of animals, veterinary skill, range management and other similar accomplishments. A ranchman cannot afford to turn over the care and breeding of thousand-dollar-bulls or five-hundred-dollar-rams and bucks to inexperienced men. There is a growing demand for technically trained men who are able to pro-

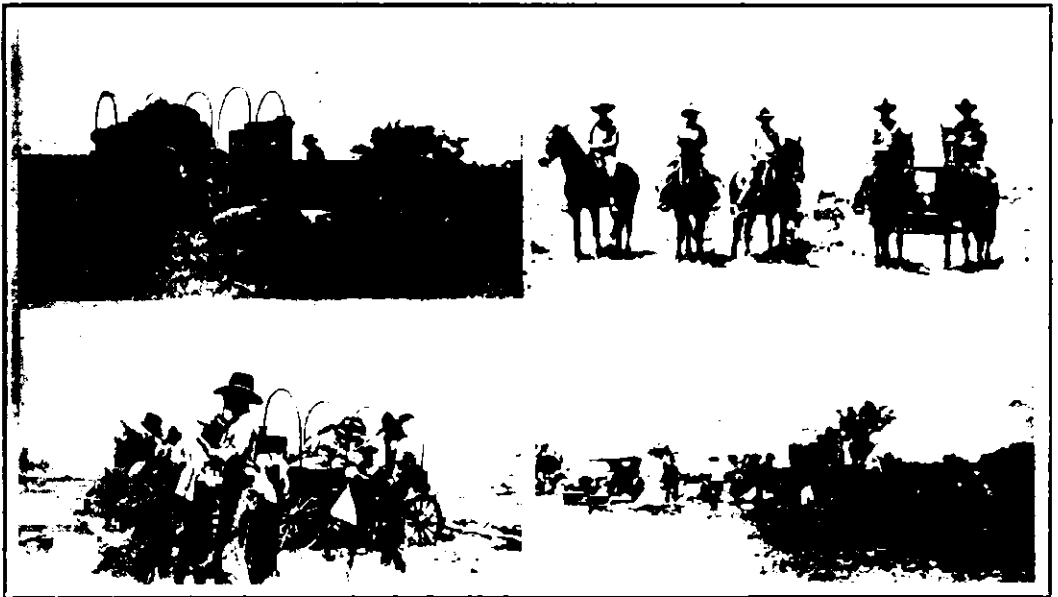


Figure 52. Dinner time on the range.

duce well bred animals on the range in a practical way and to manage ranges in accordance with sound economic policy.

### *Wages of Labor*

The wages of regular ranch labor are higher than those of farm labor. The average wage of the 118 ranch hands who boarded themselves is \$56.00 per month (August of 1920). The highest wage paid to a white man is \$150.00 per month and the lowest is \$50.00 per month. The majority of the white men receive \$75.00 to \$100.00 per month. The Mexicans receive one-half to two-thirds as much as the white men.<sup>105</sup>

<sup>105</sup> August, 1920.

The average cash wage of the 71 men who are boarded by the ranchmen is \$38.00. The lowest cash wage paid any white man receiving his board is \$30.00 and the highest is \$125.00. Most of the Mexicans in this group get \$25.00 to \$30.00 per month.

The average wage of ranch hands varies considerably, according to the size of the ranch. The group of ranches containing four and under eight sections shows the highest average wage for both those who board themselves and those who are boarded. The men who board themselves get an average of \$73.00 per month and the men to whom board is furnished get \$63.00 per month. The group showing the lowest average wage is the one containing 32 sections and over. In this group the men who board themselves get an average of \$45.00 per month and those who receive their board get a cash wage of \$30.00 per month.

A number of reasons may be offered as an explanation of the great difference between the wages of men on the small ranches and those on the large ranches. The most important fact is the comparatively large number of Mexicans used on the large ranches. Men, both white and Mexican, seem to prefer to work for big operators. The big ranches offer the men a greater opportunity to specialize. Moreover they afford an opportunity for a larger number and a greater variety of social contacts.

Table 74 shows the average rate of wages paid per group, arranged according to the size of ranches.

Extra labor is usually paid for by the day. Reports on the wages of 164 extra laborers show a daily wage averaging \$1.75. In some instances this labor is performed by the job. This is especially true with shearing. In some instances men are employed by the month for a period of two or three months. Extra labor for lambing and kidding is often paid for by the month and in addition a bonus is given for all lambs or kids saved beyond a certain per cent.

Table 75 shows the number of extra laborers, what their particular jobs are and their average pay.

TABLE 74

Showing number of operators hiring hands regularly, number hired, number hired for cash wage, number hired for cash wage and board, average cash wage paid and average wage with board paid.

Groups of Ranches By Sizes	Number of Ranches Studied	Ranch Operators Who Hire Labor Regularly	Number of La- borers Regularly Employed	Number of La- borers Regularly Employed for Cash Wage	Number of La- borers Regularly Employed for Cash Wage and Board	Average Monthly Wage Paid Labor Employed for Cash Wage	Average Monthly Wage Paid Labor Employed for Cash Wage and Board
Total .....	97	57	196 <sup>106</sup>	118	71	\$56	\$38
Under 1 section .....	1	0	0	0	0	0	0
1 and under 2 sections .....	10	0	0	0	0	0	0
2 and under 4 sections .....	5	1	1 <sup>107</sup>	0	0	0	0
4 and under 8 sections .....	25	9	11	8	3	73	65
8 and under 12 sections .....	19	14	21 <sup>108</sup>	14	4	61	46
12 and under 20 sections .....	18	14	28 <sup>109</sup>	19	7	64	54
20 and under 32 sections .....	9	9	39 <sup>110</sup>	33	5	45	56
32 sections and above .....	10	10	96	44	52	55	30

<sup>106</sup> For 2 laborers no wage is reported.

<sup>110</sup> For 1 laborer no wage is reported.

<sup>106</sup> For 7 laborers no wage is reported.

<sup>107</sup> For 1 laborer no wage is reported.

<sup>108</sup> For 3 laborers no wage is reported.

TABLE 75

Showing the number of ranchmen on different sized ranches employing extra laborers and the particular work they are supposed to do.

Groups of Ranches By Sizes	Number of Ranches Studied	Number of Operators Reporting Extra Labor Hired When Needed	Number of Extra Laborers Hired	Number of Operators Hiring Extra Labor on Each Occasion							
				Kind of Ranch Work							
				Kidding	Shearing	Lambing	Branding	Dipping	Worm Time	Other Times	Farm Work
Total .....	97	70	192	22	18	15	5	3	2	5	14
Under 1 section .....	1	1	4	0	0	0	0	0	0	0	1
1 and under 2 sections .....	10	2	2	0	0	0	0	0	0	0	2
2 and under 4 sections .....	5	4	2	0	0	0	0	0	0	1	1
4 and under 8 sections .....	25	15	26	4	4	2	1	0	0	3	2
8 and under 12 sections .....	19	15	31	9	5	9	1	0	0	1	1
12 and under 20 sections .....	18	15 <sup>111</sup>	0	3	5	3	2	1	2	0	1
20 and under 32 sections .....	9	8	53	4	2	0	0	1	0	0	5
32 sections and above .....	10	10	74	2	2	1	1	1	0	0	1

<sup>111</sup> Number of men not reported.

*Nationality of Labor*

There are more Mexicans than white laborers in Sutton County. There are 98 Mexicans, 96 white men and two negroes employed regularly on the 97 ranches studied. Most of the Mexican laborers are on the ranches containing 20 or more sections of land. There are 14 Mexicans working regularly on ranches containing less than 20 sections and 84 on the 19 ranches containing 20 sections and above.

Table 76 shows the distribution of hired labor regularly employed by nationality and by groups of ranches.

TABLE 76

Showing distribution of hired labor regularly employed, by nationality and different sized ranches.

Groups of Ranches By Sizes	Total Number Laborers	White	Mexican	Negro
Total .....	196	96	98	2
Under 1 section .....	0	0	0	0
1 and under 2 sections .....	0	0	0	0
2 and under 4 sections .....	1	0	0	1
4 and under 8 sections .....	11	8	3	0
8 and under 12 sections .....	21	14	7	0
12 and under 20 sections ...	28	23	4	1
20 and under 32 sections ...	39	19	20	0
32 sections and above .....	96	32	64	0

The extra labor is also very largely Mexican. Most of the shearing is done by Mexican crews. Mexicans are secured to do most of the kidding and lambing. As a rule Mexicans come over from Mexico in the spring and do the shearing, lambing and kidding work on farms during the late spring and summer. When there is a very large crop of cotton in North Texas it is difficult to retain the laborers in Sutton County even though thousands of them come over from Mexico.

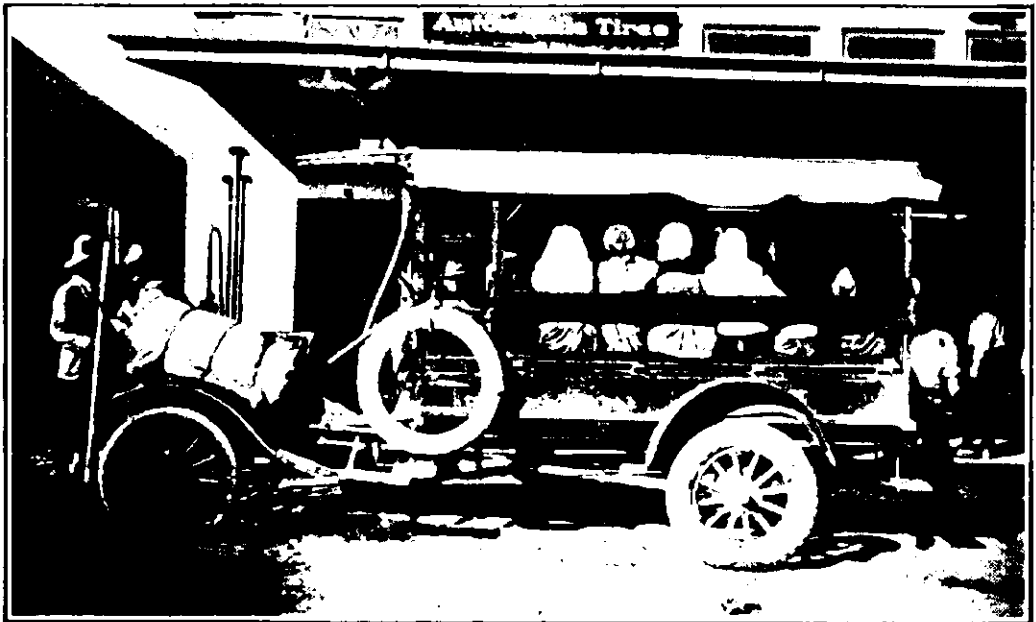


Figure 53. Showing method of importing Mexican laborers.

*Age and Conjugal Relation of Laborers*

Ranch laborers are as a rule much older than farm laborers. This is true because the work is more like a profession

TABLE 77

Showing 100 ranch laborers regularly employed, distributed by age groups.

Age groups	Total ranch Laborers	White Laborers	Mexican Laborers	Negro Laborers
Total .....	100	71	27	2
Under 20 years .....	3	3	0	0
20 and under 30 years .....	34	30	4	0
30 and under 40 years.....	37	24	12	0
40 and under 50 years .....	16	10	5	1
50 and under 60 years .....	7	2	4	1
60 and under 70 years .....	3	2	1	0

and employment is by the year. The average age of white laborers regularly employed is 32 years. The average age of Mexicans regularly employed is 36 years. The average age of all laborers regularly employed is 33 years. There are only three men who work regularly who are under 20 years of age and there are 10 who are 50 years of age and over.

Table 77 shows the distribution of laborers by nationality and age groups.

Of the 196 ranch hands regularly employed, 101 are married and 95 are single. Many of the married men have saved enough money to start into business for themselves on a small scale, but prefer to work for wages on a large ranch. Many of the ranch owners live in Sonora or some other town. Where that is the case the owner is very anxious to have a married man stay on his ranch. The married laborer's wife is often employed to cook for extra hands. Ranch owners are eager to get married men, too, because they are more dependable and are not so likely to leave.

The total number of children reported by all ranch hands is 111. There are 70 white children, 40 Mexicans and one negro. As a rule the children are under school age, but where they are not they may get their schooling in one of several ways. They may be boarded in town, the wife may live in town and keep the children, or a governess may be employed to teach on the ranch. Some send the children into town by auto.

#### *Length of Period of Employment*

Reports on the length of time laborers have been in the continuous employment of their present employers were obtained for 117 different men of the 196 regularly employed hands. The average term of service for the 117 laborers was 2.8 years. Thirty-seven of these men had been in service less than one year and five of this number had been in service longer than one month. Sixteen laborers had been working continuously for the same employer five years or more.

The Mexican laborers have been working for their present employers longer than the white laborers. The white laborers have been working for their present employers an average of



1.8 years and the Mexicans have been working for their employers an average of 4.1 years.

Table 78 shows the 117 laborers upon whom reports were obtained as to length of service, grouped according to nationality and length of time in the service of present employers.

TABLE 78

Showing 117 laborers regularly employed, grouped according to nationality and length of service.

Length of Service	Total Laborers Reported	White	Mexican
<b>Total</b> .....	117	72	45
<b>Under 1 year</b> .....	37	30	7
<b>1 and under 2 years</b> .....	35	21	14
<b>2 and under 3 years</b> .....	11	8	3
<b>3 and under 4 years</b> .....	14	7	7
<b>4 and under 5 years</b> .....	4	1	3
<b>5 years and over</b> .....	16	5	11

## CHAPTER XIII

### RANCH PRODUCTS

#### CLASSIFICATION

Compared with farming, the permanent ranching areas produce a more limited variety of products. Ranchmen are primarily concerned with the growing of livestock and livestock products such as wool and mohair, yet they are incidentally interested in the production of a variety of products such as truck crops, poultry and different kinds of meat for home consumption.

Ranch products, therefore, may be divided into two classes: (1) those which are grown for use on the ranch; (2) those which are produced for market. Class (1) may be subdivided into two parts, (a) those consumed by the ranch family and (b) those used in the production of other products for sale.

#### *Products for Home Consumption*

The chief types of ranch products grown for home consumption are veal, beef, pork, bacon, lard, hams, mutton, lamb, kid, chickens, eggs and turkeys. Quite a variety of vegetables are grown for home use by those ranchmen having sufficient water storage facilities to permit the irrigation of a garden. Some of the more common vegetables grown are beans, peas, onions, tomatoes, potatoes and corn. Very little fruit is grown in the country partly because of a lack of adaptation and partly because of an inadequacy of water for irrigating orchards. Most of the ranchmen are interested in the protection of certain wild game such as deer, turkeys and quail. This adds not only to the food supply, but is a source of recreation during the hunting season.

#### *The Production of Work Stock*

Saddle horses, work horses and mules are grown on the ranches of Sutton County not so much for sale as for use in connection with the production of other livestock and livestock products. Ranchmen believe that it is profitable to grow them for this purpose, but that under present marketing conditions it is uneconomical to produce a surplus for sale. Work stock

is fed only when it is at work. The rest of the time it is sustained by grazing. About half of the ranchmen of Sutton County produce a part of their feed supply for horses and mules. Most every ranchman has a small field which is either planted in corn or oats or else set to Johnson grass which is mowed for hay. More than 75 per cent. of the ranchmen, however, buy the greater part of the grain which they feed to their saddle horses and teams.

*Products Grown for Market*

The more important ranch products grown for market in Sutton County are horses, cattle, sheep, goats, wool and mohair. Some of the ranches also produce a surplus of hogs which goes to market.

Table 79 shows the writers' estimates of the numbers and weights of beef cattle, sheep and goats which are normally sold out of Sutton County on foot.

TABLE 79 <sup>112</sup>

Showing the number of pounds of cattle, sheep and goats shipped out of Sutton County annually, based on the 105,112 units of carrying capacity devoted to cattle, sheep and goats. Of these, 57,782 are devoted to cattle, 34,640 to sheep and 12,686 to goats. It is estimated that the cattle are sold as cull bulls and cows and steers as two's and surplus heifers as yearlings, the sheep as culls and lambs, and goats as culls and yearlings.

Type	Class	Number for Sale	Average Weight of Animal	Weight per Class
Cattle	Total	12,662	812.5	8,933,050
	Bulls	111	1200	133,200
	Cows	2,776	750	2,082,000
	Yearling heifers	3,067	550	1,686,850
	Two-year-old steers	6,708	750	5,031,000
Sheep	Total	100,453	85	6,439,285
	Rams	547	125	68,375
	Ewes	21,902	95	2,080,690
	Lambs, ram	55,668	55	3,061,740
	Lambs, ewe	22,336	55	1,228,480
Goats	Total	34,130	85	2,734,300
	Bucks	195	100	19,500
	Does	7,863	80	629,040
	Yearling does	7,456	80	596,480
	Yearling muttons	18,616	80	1,489,280

112 See tables 44, 48, and 51.



Figure 54. Growing cattle like these will increase the quality and quantity of the product of the range.

Table 80 shows the numbers of sheep and goats owned and sheared in Sutton County in 1920, and the estimated yield of wool and mohair in pounds. The average weights of fleeces are estimates based upon data gathered by the Ranch Experiment Station, and Mr. J. M. Jones, Chief of the Division of Animal Industry, of the Texas Station.

TABLE 80

Showing the number of pounds of wool and mohair shipped out of Sutton County annually, based on the number of sheep and goats in the county August, 1920, and the estimated average weight of fleeces by classes of animals.

Type	Class	Number	Estimated Average Weight of Fleece	Pounds of Wool and Mohair
Sheep	Total .....	271,876		1,927,819
	Rams .....	2,949	15	44,235
	Ewes .....	106,768	8	854,144
	Lambs .....	84,657	3.5	296,300
	Yearlings .....	20,940	8	167,520
	Muttons .....	56,562	10	565,620
Goats	Total .....	124,122		622,500
	Bucks .....	892	9	8,028
	Does .....	45,043	6	270,258
	Kids .....	36,340	1.2	43,608
	Yearlings .....	8,831	6	52,986
	Muttons .....	33,016	7.5	247,620

According to the foregoing tables, Sutton County annually markets 18,106,635 pounds of cattle, sheep and goats on foot; 1,927,819 pounds of wool and 622,500 pounds of mohair. This amounts to an average of 186,605 pounds of meat animals, 19,871 pounds of wool and 6,417 pounds of mohair per average sized ranch of 15 1-2 sections. Stated in yields per section it

amounts to 12,039 pounds of meat animals, 1282 pounds of wool and 414 pounds of mohair. The 18,106,635 pounds of meat animals on foot are subdivided as follows: Beef cattle, all types sold included, 8,933,050 pounds; muttons 6,439,285 pounds; goats 2,734,300 pounds. This amounts to 92,070 pounds of beef animals, 66,356 pounds of muttons and 28,179 pounds of goats per ranch, or 5940 pounds of beef animals, 4281 pounds of muttons and 1818 pounds of goats per section.

It is interesting to compare the products from cattle, sheep and goats with the percentages of carrying capacity which each of these types consume on Sutton County ranges. Cattle consume 54.97 per cent. of the carrying capacity and produce 49.34 per cent. of the meat sold on foot; sheep consume 32.96 per cent. of the carrying capacity and produce 35.56 per cent. of the meat, and goats consume 12.07 per cent. of the carrying capacity and produce 15.1 per cent. of the meat. In addition to cattle, sheep and goats, according to the estimates of 56 ranchmen, there is produced annually a surplus of about 40,000 pounds of hogs on foot and this surplus is sold out of the county.

Attention is called to the fact that in addition to the meat produced, sheep produced 1,927,819 pounds of wool and the goats produced 622,500 pounds of mohair. These figures are, of course, based upon estimates, but the estimates have been checked to the extent that the writers feel that they are the most reliable figures extant. If these estimates are to be depended upon, then cattle are the least efficient users of carrying capacity of the three types of livestock produced for market on Sutton County ranges; probably goats next and sheep the most efficient. Offsetting these facts, however, a perusal of market quotations indicates that cattle are the most stable in price of the three types and normally bring a little more money per pound; sheep next and goats least.

The writers' estimates of the weights of sheep, goats, wool and mohair sold out of the county check rather consistently with the estimates of 85 ranchmen as shown in the following tables. The ranchmen estimated the production of muttons on foot at 7,233,900 pounds whereas the writers' estimate was 6,439,285

TABLE 81  
Showing ranchmen's estimates of the tonnage in pounds going out of Sutton County.

Groups of Ranches By Sizes	Number of Ranches Studied	Number Ranches Reporting	Tonnage in Pounds Going Out of Sutton County						
			Total Pounds	Number Ranches Reporting	Cattle	Sheep	Goats	Wool	Mohair
Total .....	97	85	26,307,950	309,509	13,851,950	7,233,900	2,698,850	1,906,350	546,900
Under 1 section .....	1	1	4,400	4,400	600	3,000	0	0	800
1 and under 2 sections .....	10	8	212,000	26,500	48,600	35,500	102,300	7,500	18,100
2 and under 4 sections .....	5	5	270,400	54,080	112,000	90,000	44,800	17,900	5,700
4 and under 8 sections .....	25	20	2,324,250	116,213	759,250	895,000	408,000	214,900	47,100
8 and under 12 sections .....	19	17	3,642,200	214,247	1,565,000	1,203,000	453,000	331,000	90,200
12 and under 20 sections .....	18	15	4,663,100	310,873	2,026,500	1,701,000	401,500	469,600	64,500
20 and under 32 sections .....	9	9	4,274,450	474,939	2,380,000	1,100,000	376,750	315,200	102,500
32 sections and above .....	10	10	10,847,150	1,084,715	6,960,000	2,206,400	912,500	550,250	218,000

pounds. The ranchmen's estimates as to the number of pounds of goats on foot produced for market amounted to 2,698,850 whereas the writers' estimates are 2,734,300 pounds.

The greatest discrepancy comes between the writers' estimates and the ranchmen's as to the amount of beef produced for market. The ranchmen's estimate was 13,841,950 pounds whereas the writers' is 9,933,050 pounds per annum. The difference between the two estimates is undoubtedly due to the fact that the writers have been more conservative in their estimates as to the weights of the different classes within the types of cattle than most of the ranchmen.<sup>113</sup>

Table 81 shows the estimates of the ranchmen as to the tonnage in pounds going out of the county.

For comparison with the foregoing table, Table 82 is presented, showing the estimates of the ranchmen as to the tonnage in pounds of incoming freight, the distance, hauled and the cost of freighting.

---

<sup>113</sup> See carrying capacity tables in Chapter VIII, pages 163 to 227. Attention is called to the fact that the estimates as to normal weights by classes are based also on the judgment of experienced ranchmen.



TABLE 82  
Showing ranchmen's estimates of the tonnage in pounds of incoming freight, distance hauled and cost of freighting.

Groups of Ranches By Sizes	Number of Ranches Studied	Tonnage in Pounds of Incoming Freight			Distance Hauled				Total Freight Cost	Average Cost per Ranch
		Number Ranches Reporting	Pounds of Freight	Pounds per Ranch Reporting	Under 50 Miles	50 and 75 Miles	75 and 100 Miles	100 Miles and Over		
<b>Total</b> .....	97	73	5,079,500	516,445	7	27	34	12	\$40,438	\$554
Under 1 section .....	1	1	1,000	1,000	0	1	0	0	7	7
1 and under 2 sections .....	10	7	19,500	2,786	3	3	1	1	140	20
2 and under 4 sections .....	5	5	70,000	14,000	1	4	0	0	426	85
4 and under 8 sections .....	25	15	280,000	18,667	1	6	8	4	3,502	233
8 and under 12 sections .....	19	15	712,000	47,467	2	4	6	3	5,995	400
12 and under 20 sections .....	18	13	672,000	51,692	0	2	9	2	6,056	466
20 and under 32 sections .....	9	8	820,000	102,500	0	3	5	1	6,192	774
32 sections and above .....	10	9	2,505,000	278,333	0	4	5	1	18,120	2,013

## FACTORS DETERMINING THE QUANTITY OF SALABLE PRODUCTS

There are many factors determining the amount of livestock and livestock products produced in a given ranching section. The principal factor is the carrying capacity which, as shown in Chapter VIII, is itself influenced by many factors. The quantity of ranch products tends to vary directly with the carrying capacity. In fact, carrying capacity is measured in terms of products. Ranges, however, may have a high potential carrying capacity and yet a limited product because of understocking or poor management. The year 1918 marked the close of a protracted drouth in Sutton County which left the ranges under-stocked in 1919 with reference to practically all types of livestock usually run.

TABLE 83

Showing the actual ratio of calf, lamb and kid crops to number of mother animals for the years 1920 and 1919, grouped according to the size of ranches.

Groups of Ranches By Sizes	Number of Ranches Studied	Calf Crop		Lamb Crop		Kid Crop	
		Ratio to 100 Cows in 1920	Ratio to 100 Cows in 1919	Ratio to 100 Ewes in 1920	Ratio to 100 Ewes in 1919	Ratio to 100 Does in 1920	Ratio to 100 Does in 1919
Total .....	97	85	74	86	88	89	91
Under 1 section .....	1	0	0	0	0	0	0
1 and under 2 sections ..	10	98	93	100	82	96	97
2 and under 4 sections...	5	94	87	88	96	100	96
4 and under 8 sections...	25	85	77	86	88	94	95
8 and under 12 sections .	19	87	78	89	88	89	93
12 and under 20 sections.	18	84	70	88	88	87	94
20 and under 32 sections.	9	78	71	81	84	89	75
32 sections and above ...	10	76	51	78	88	76	66

The quantity of meat animals, wool and mohair produced is affected by the percentage of increase. The ranchman who maintains a calf, lamb or kid crop, for example, of 90 per cent. produces considerably more meat for the market at a lower expense than the one who produces only a 50 per cent. crop.

Table 83 shows the estimated averages of the actual percentages of calf, lamb and kid crops produced on the ranches of Sutton County for the years 1920 and 1919, grouped according to the size of the ranches.

The percentage of increase varies rather widely from ranch to ranch and from season to season. Many ranchmen do not keep a sufficient number of bulls, rams and bucks for their cows, ewes and does. The average ratio of bulls kept is one to 37 cows. It would probably pay to have one bull to 25 cows on the range. The average number of rams kept is one to 43 ewes, yearling ewes included, and one buck is kept to 48 does. The exact proportions of sires to dams is determined by the method of breeding, a greater number of sires being required on the ranges than in breeding barns or pens. On dry years the percentages of increase are very low. During the year 1918 several ranchmen reported as low as 15 per cent. calf crop. There was, of course, a similar reduction in the lamb and kid crops. In 1920, which was a favorable year, the average calf crop obtained in Sutton County was 85 per cent. In 1919, which was also a favorable year, the average lamb crop was 88 per cent. and the average kid crop was 91 per cent.

The system of grazing followed has an important influence upon the quantity of ranch products. The carrying capacity is improved and maintained by a suitable system of deferred, rotative and diversified grazing, which has been discussed in Chapter VIII.

The quantity of ranch products is also influenced by skill in the management of the herds and flocks. Ranchmen ordinarily do not pay enough attention to the matter of breeding. The breeding herds and flocks are often allowed to run loose in big pastures with slight if any attention. The better managers, however, place breeding animals in small pastures with proper proportions of males and females and give them close super-

vision. Breeding animals should be kept in good living condition. This is accomplished by properly stocking the ranges and by supplemental feeding for a few weeks before and after calving, lambing and kidding times. Animals of low vitality drop and raise a very poor percentage of increase.

The percentage of increase raised is influenced also by the method of calving, lambing and kidding. Mother cows and ewes should be placed in small pastures so that they may be inspected daily and attention given them in case they need it. On the large ranches it is better for lambing to be done under herd than to let the ewe shift for herself.



**Figure 55.** Kids in boxes in shade, to protect them from wind and heat of sun; Ranch Experiment Station.  
A large part of the kidding is done in this manner.

The kidding of goats requires more attention than the lambing of sheep. Both does and kids are more restless than ewes and lambs and the chances of their becoming permanently separated are greater. With most of the larger flocks of goats, kidding is usually done under herd while with smaller

flocks kidding is done in kidding pens with kid boxes and stakes. Some of the ranchmen with the smaller flocks, however, claim to have kidded loose with satisfactory results. Forty-nine out of 72 ranchmen stated that they kidded under herd.

Tables 84, 85 and 86 indicate how the ranchmen handle cows, ewes and does before, during and after calving, lambing and kidding.

TABLE 84

Showing answers to question, "How do you handle cows preceding, during and following calving?" Numbers of answers received, kind of answers given, and number of times each was given.

Groups of Ranches By Sizes	Number of Ranches Studied	"How do You Handle Cows Preceding During, and Following Calving?"				
		Number of Answers Given	No Special Care	Some Special Care		
				"Feed Poor"	"Put in Special Traps"	Other Care
Total .....	97	87	48	30	7	2
Under 1 section .....	1	0	0	0	0	0
1 and under 2 sections .....	10	8	5	3	0	0
2 and under 4 sections .....	5	4	2	2	0	0
4 and under 8 sections .....	25	20	8	10	1	1
8 and under 12 sections .....	19	18	13	3	2	0
12 and under 20 sections .....	18	18	10	3	4	1
20 and nuder 32 sections .....	9	9	4	5	0	0
32 sections and above .....	10	10	6	4	0	0

TABLE 85

Showing answers to question, "How do you handle does preceding, during and following kidding?" Number of answers received, kind of answers given and number of times each was given.

Groups of Ranches By Sizes	Number of Ranches Studied	"How do You Handle Does Preceding, During and Follow- ing Kidding?"			
		Number of Answers Given	"Kid Under Herd"	"Kid Loose"	"Feed Does Before Kidding"
Total .....	97	72	45	23	4
Under 1 section .....	1	0	0	0	0
1 and under 2 sections .....	10	7	3	3	1
2 and under 4 sections .....	5	4	1	3	0
4 and under 8 sections .....	25	15	11	2	2
8 and under 12 sections .....	19	15	9	5	1
12 and under 20 sections .....	18	15	9	6	0
20 and under 32 sections .....	9	7	6	1	0
32 sections and above .....	10	9	6	3	0

TABLE 86

Showing answers to question, "How do you handle ewes preceding, during and following lambing?" Number of answers received, kind of answers given and number of times each was given.

Groups of Ranches By Sizes	Number of Ranches Studied	"How do You Handle Ewes Preceding, Dur- ing and Following Lambing?"					
		Number of Answers Given	Answers Classified				
			"Lamb Loose"	"Lamb in Traps"	"Lamb Under Herd"	"Riders Among Herd"	"Feed Prior to Lambing"
Total .....	97	95	48	15	8	3	21
Under 1 section .....	1	0	0	0	0	0	0
1 and under 2 sections ...	10	6	5	0	0	0	1
2 and under 4 sections ...	5	5	3	0	0	0	2
4 and under 8 sections ...	25	21	11	5	0	1	4
8 and under 12 sections ..	19	20	9	2	1	1	7
12 and under 20 sections..	18	20	9	7	1	1	2
20 and under 32 sections ..	9	9	5	1	2	0	1
32 sections and above ....	10	14	6	0	4	0	4

The size of the ranch has some influence upon the percentage of increase. The owners of big ranches cannot give their livestock the amount of personal attention which the men on the small ranches are able to give.

Table 87 shows the average of the ranchman's estimates of the normal percentages of calf, lamb and kid crops for Sutton County, grouped according to size of ranches.

TABLE 87

Showing the average of the estimated percentages of the normal calf, lamb, and kid crops raised, to number of mother animals bred, grouped according to the size of ranches.

Groups of Ranches By Sizes	Estimated Average Calf Crop Raised	Estimated Average Lamb Crop Raised	Estimated Average Kid Crop Raised
Total .....	73	83	88
Under 1 section .....	0	0	0
1 and under 2 sections .....	92	91	94
2 and under 4 sections .....	82	85	86
4 and under 8 sections .....	76	84	87
8 and under 12 sections .....	69	86	87
12 and under 20 sections .....	68	80	87
20 and under 32 sections .....	67	81	86
32 sections and above .....	65	80	87

The death loss is an important factor in determining the amount of livestock sold annually. Death losses in Sutton County vary from two per cent. on some of the ranches to as high as 10 per cent. or more on others. The average death loss for cattle is about 6 per cent. per annum. The death loss for mother cows and calves up to one year old is greater than for other classes. Ordinarily the death losses among sheep and goats are greater than for cattle.

Table 88 shows the causes and percentages of death losses on Sutton County ranches, grouped according to size.

TABLE 88  
Showing Causes and Percentages of Death Losses in Cattle.

Groups of Ranches By Sizes	Number of Ranches Studied	Causes of Losses in Cattle						Percentage of Losses				
		Number Reporting	Black Leg	Poverty	Worms	Other Causes	Number Reporting Percentage	2%	3%	5%	10%	
Total .....	97	57 <sup>114</sup>	34	29	21	11	42	6	11	15	10	
Under 1 section .....	1	0	0	0	0	0	0	0	0	0	0	
1 and under 2 sections .....	10	5	2	3	0	0	1	1	0	0	0	
2 and under 4 sections .....	5	3 <sup>115</sup>	2	2	0	1	2	1	1	0	0	
4 and under 8 sections .....	25	11 <sup>116</sup>	4	5	6	2	9	1	1	3	4	
8 and under 12 sections .....	19	13 <sup>117</sup>	8	3	6	3	9	1	3	4	1	
12 and under 20 sections .....	18	12 <sup>118</sup>	9	7	3	3	12	1	4	4	3	
20 and under 32 sections .....	9	6 <sup>119</sup>	4	4	3	0	3	0	1	1	1	
32 sections and above .....	10	7 <sup>120</sup>	5	5	3	2	6	1	1	3	1	

114 Thirty-two operators give two causes of losses in cattle and three give three causes.  
 115 Two operators give two causes of losses in cattle.  
 116 Four operators give two causes of losses in cattle and one gives three causes.  
 117 Five operators give two causes of losses in cattle and one gives three causes.  
 118 Ten operators give two causes of losses in cattle.  
 119 Five operators give two causes of losses in cattle.  
 120 Six operators give two causes of losses in cattle and one gives three causes.



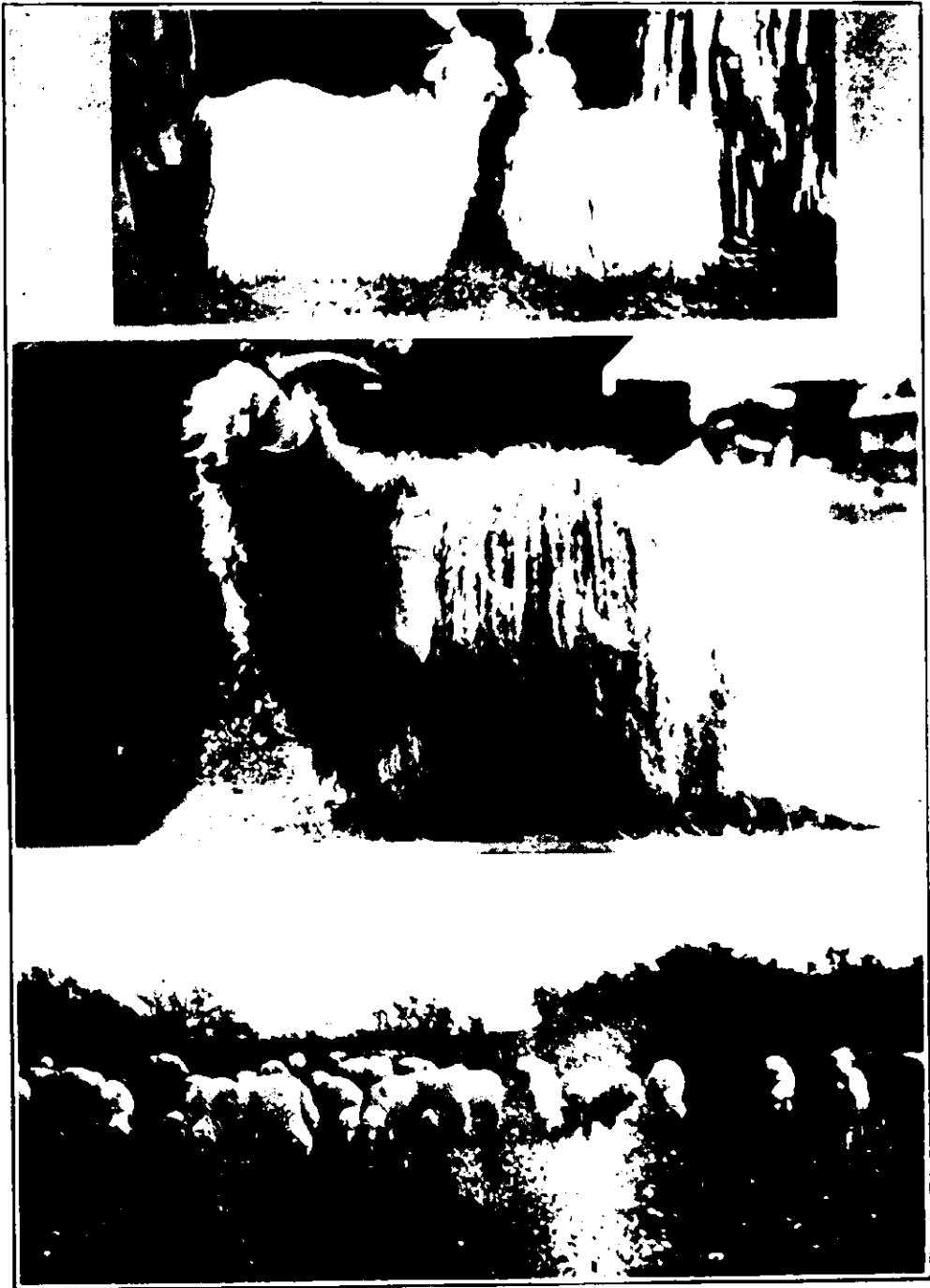


Figure 56. The use of breeding stock like this will increase the weights of the fleeces of wool and mohair.

## RELATIVE IMPORTANCE OF THE DIFFERENT RANCH PRODUCTS

The quantities of wool and mohair produced depend in part upon the weight of the fleeces, the better bred sheep and goats producing the heavier fleeces, and in part, of course, upon numbers. If the sheep and goats are produced primarily for meat, the importance of wool and mohair is minimized and these crops are correspondingly small. If, however, sheep and goats are kept primarily for their wool and mohair these become more important products than meat. Many ranchmen, however, are now breeding for mutton, wool and mohair. They are breeding purebred Rambouillets or Rambouillet rams crossed on Merino ewes. These sheep produce a fairly heavy fleece of good quality and are large enough to make fair muttons. If, by the use of the larger type of rams or bucks, the wool or mohair becomes coarse, the ewes and does are bred back to the smaller and finer fleeced sires.

Table 89 shows the weights of fleeces of the different classes of sheep and goats on the Ranch Experiment Station located in Sutton County.

TABLE 89

Showing the average weights of fleeces of different classes of sheep and goats on the Texas Ranch Experiment Station, for 1919.

Type	Class	Number in class	Average weight of fleece in pounds
Sheep	Registered rams .....	3	19.16
	Registered ewes .....	11	14.95
	Grade ewes .....	91	9.03
	Grade yearling ewes .....	93	9.23
	Yearling muttons .....	40	9.36
Goats	Registered bucks .....	12	12.6
	Registered does .....	55	7.67
	Selected grade yearling does..	124	6.16
	Kids .....	248	1.7
	Muttons .....	44	8.95

## CHAPTER XIV

# MARKETING RANCH PRODUCTS

## MARKETING DEFINED AND DESCRIBED

Marketing is the process whereby goods are exchanged either for other goods or for their value in terms of some medium of exchange—money or some form of credit instrument. It is practically impossible to conceive of a time when man lived in a state of absolute self-sufficiency and there was neither a division of labor nor an exchange of goods. Even at so remote a time as when men lived in family groups, there was evidently some division of labor and, therefore, some exchange of goods. In these times it is probable that the men did such things as the hunting or the fishing while the women prepared the food and did other work about the habitation.

### *Barter Economy*

Marketing had its origins with the beginnings of the division of labor. The earliest conceivable stage in the development of human society is that in which goods were exchanged by barter. The bartering process was one of exchanging goods for goods. A man skilled in hunting might exchange meat for fish with the man skilled in fishing. The main difficulty in this form of marketing was for two men wanting each other's products to get together. In a given area one man might have an extra canoe which he wished to trade for a buffalo skin. He might find plenty of men with skins to trade, but none who wished the canoe, or men who wished the canoe, but didn't have buffalo skins.

### *Money Economy*

Most of these difficulties were overcome by the development of the use of a medium of exchange. At first this may have been a slave or some form of livestock. Later on it may have been grain. The medium of exchange was usually the most universally desired, the most valuable and the most trans-

portable good in the trading region. Eventually metals came into use as a medium of exchange and these came to be coined and stamped so that their value was easily recognized and they could be moved about more conveniently than other more bulky and less durable media. Eventually the more precious metals, gold and silver, came into use because of their superiority as media of exchange.

This was a vast improvement over barter. Now one could exchange his surplus products for money and in turn exchange money for any goods desired. He could barter if he chose to do so, but if he wished to accumulate values which he could later on exchange for goods, he had the option of doing so. The use of money thus generally encouraged the division of labor, the accumulation of capital and the development of markets.

### *Commercial or Credit Economy*

While mankind was probably many thousands of years developing from the stage of barter to that of money economy, the invention of labor saving machinery such as the carding machines, the spinning jenny, the power loom and the steam engine, brought on vast strides in the division of labor. The invention of the steamboat and other means of transportation and communication extended the markets so that during the past 150 years men have come to spend their lives at producing a given product or even performing a single task in the process of producing it.

Producer and consumer, who were originally either one and the same or else lived together as neighbors, are now far apart. Originally it was possible for producer and consumer to sympathize with each other and to be very considerate of each other's rights. Today one kind of producer usually knows nothing of another and being wholly unacquainted with the other's process of production, he is in a rather poor bargaining position and may be entirely out of sympathy with him.

Agricultural production, however, is of such a nature that the division of labor cannot be resorted to as extensively as in industry and commerce. While agriculture has advanced to

the commercial stage and the farmer now produces primarily for distant markets, he still produces many products for the consumption of his own family. His isolation on the farms and ranches, together with his partial self-sufficiency, tends to make him normally less familiar with market and marketing and the facilities with which they are affected than any other type of producer.

Since, however, he is primarily dependent upon the markets for his income, it is to his interest to understand their nature. The separation of producer and consumer has vastly enlarged and complicated the marketing process. Considerable quantities of both capital and time are now required in producing a good and getting it to the consumer. Some one must play the part of the capitalist and not only provide the funds or credit necessary in production, but also do the waiting. This fact has given rise to the necessity of credit institutions, the purpose of which is the financing of production and marketing operations. Because of the growth of the division of labor, the separation of producer and consumer and the rise of the more extensive use of capital and credit in production, this, the present stage, is designated as that of commercial or credit economy.

#### *"Market" Defined and Described*

The word "market" may be variously used depending upon the viewpoint. It may mean a place where buying and selling occur. When a man says he has shipped his cattle to market that is what he means.

The word is often used to mean the price at which goods are exchanged either within a given sphere or the quotations which are published at a given time. When one says that the market is up or down, he is using the term in this sense. As such it means the equilibration of supply and demand.

It may mean a locality or country. When one says that New York City is a good market for meats, dairy products and fruits, he is using the term in this sense.

The term is also used in the sense of the field or sphere over which the forces which determine prices operate. When

one says there is a world market for wool, meats, cotton, wheat and similar products, he means that the forces determining the prices of these products are world-wide.

Possibly the more usual use of the term is a loose combination of all these meanings. When ranchmen speak of the Fort Worth market they probably mean Fort Worth as a place at which livestock sales are taking place, a source of market quotations and a center of price-determining forces.

### *The Economic Basis of Marketing*

The field of economics may be divided into *production*, *exchange*, *distribution* and *consumption*. By production is meant the creation of utilities. To the extent that marketing adds utilities to the products marketed it becomes a part of economic *production*; to the extent that it has to do with the distribution of the proceeds received from the sale of the products among the factors of production or among those persons who have added utilities, it is a part of *distribution*; to the extent that it has to do with the transfer of goods from one ownership to another, it is a part of *exchange*; and to the extent that it is a matter of providing consumers with goods for the satisfaction of their wants, it is a part of *consumption*.

While obviously marketing is intimately connected with economic exchange, distribution and consumption, for all practical purposes it is primarily a part of production. Ordinarily when we speak of agricultural production we think of the farmer and the ranchman. While in the economic stages of self-sufficiency the farmer or stockman may have created the greater part of all the utilities possessed by the finished product, in the present stage of commercial economy he is but one of a number of contributors to the several utilities which the consumer enjoys. This fact will become more evident as we proceed.

Most economists recognize four different kinds of utilities as follows: elementary utility, form utility, place utility and time utility. A few recognize a fifth kind, called possession utility, upon the theory that the possessor of the goods adds utility to them by the mere fact of ownership. This, however,

might be included under the term "time utility" for the reason that men secure interest and profits as their reward for owning and holding goods from times of plenty to times of scarcity. The different forms of utility may be best illustrated by calling attention to the several steps in the process of creating and marketing. First we have the growing or creation of the raw products. Then in varying order, depending upon the nature of the commodity marketed, we have assembling, grading, standardizing, packaging, transporting, processing, manufacturing, storing, risk-taking, financing, distributing and retailing.

Elementary utility is created when the farmer or ranchman grows the raw materials on his farm or ranch. Place utility is created, for example, in the processes of assembling and transporting the goods to market. Form utility is created, for example, in grading, standardizing, packaging and processing or manufacturing the raw materials into finished products. Time utility is created primarily in storing and financing. Time utility, of course, to an extent, enters into every step in the process of creating and marketing.

At each step in the marketing process wherein utilities are added to the product, a productive service is performed. Hence production may be conceived of as the creation of utilities possessed by the finished product. Goods are exchanged on the basis of value. Value is expressed in terms of the medium of exchange. Value thus expressed is known as *price*.

Only goods which have value are exchanged in the markets. We have a few goods left which are free, air and sunshine, for example. They possess utilities, but are so abundant that they have no value. It is only useful goods which are scarce or relatively scarce that possess value. In fact it is only after a good becomes relatively scarce that men will exert themselves to produce it. They must have some confidence in the prospect of being compensated for their efforts before they will proceed with the work of production.

In years gone by the ranchmen have paid too little attention to their marketing problems. They have too often accepted prices based upon a real or an assumed abundance at their end of the marketing process, while consumers have been induced to pay for ranch products at prices based on their real or

assumed scarcity in forms available for consumption at their doors. This seeming abundance of the products in the hands of the ranchmen and scarcity at the doors of the consumers have often been attributed to the activities of middlemen. In recent years farmers' and ranchmen's organizations have begun to recognize this distinction and to insist that the scarcity at the consumer's end of the line be made the basis of price, and its distribution be made backward to the producer through the several necessary steps in marketing.

Some men say that even now the scarcity which exists at the door of the consumer actually determines the distribution of the price which he pays back through the several agencies of marketing and production because of the existence of free competition. This, however, is a debatable question. If competition worked perfectly, the scarcity or abundance of a given commodity would tend to be of like intensity everywhere at a given time and in that case the price at the consumer's door would be the price at the door of the farmer or ranchman, less the expenses of marketing.

If in the past competition has not worked perfectly and prices have not been the resultant of supply and demand, the blame can hardly be laid at the doors of farmers and ranchmen. They have not only not done anything to interfere with free competition, but until recent times they have not even actively defended themselves against those who may have combined to determine the prices of what they bought and sold. If, therefore, they are to be blamed at all, it is for their sins of omission rather than those of commission. They have failed to organize for the purpose of acquiring bargaining strength comparable with that of the industrial and commercial concerns with which they have dealt. Farmers and ranchmen have thus lagged far behind their commercial and industrial brothers in the matter of organization for business purposes.

Since it is both impractical and impossible to disorganize capital and labor with a view to placing commercial and industrial concerns on the same level of bargaining equality with the unorganized farmers and ranchmen, it is only in the interest of fair competition that the latter organize for the purpose of strengthening their bargaining powers and of securing for



themselves some of the economies of large-scale business operation.

## RANGE LIVESTOCK MARKETING

### *Range Livestock a Perishable Product*

Meat, the principal product of the range, is highly perishable. It may perish on the living animal, it may perish as a result of the death of the animal or it may perish after the animal has been slaughtered. In young animals, the loss in weight is partly compensated for in the growth of frame, but even then there is an irrecoverable loss that must be put back at considerable expense if put back at all. There is an annual death loss of range livestock of from 3 to 10 per cent. Losses in spoilage after slaughtering have been greatly reduced as a result of vast improvements in cold storage, but are still considerable.

Falling off in weight and spoilage are, however, not the only losses. A matter of even greater consequence is the loss in quality. On January 18, 1922, prime steers were quoted at \$7.00 per hundred pounds, while common steers were quoted at \$2.50 to \$3.00. The quality of the common steer is less affected by hardship than that of a prime steer simply because he has less quality to lose. As the expenses of production increase, it becomes increasingly important that the ranchman not only convert the carrying capacity of his range into the greatest quantity, but also into the highest market quality of product. Many men continue to grow common livestock simply because they realize that high-grade livestock deteriorates more than common. In following this policy, however, they obviously eliminate the possibilities of an increased income from keeping better stock.

Ranchmen are unable to hold their cattle and sheep off the market for a great while after they are ready to go. It is generally recognized that when steers get fat in the fall or spring they must be marketed within a few weeks if they are to be marketed at all that season. Most ranchmen say that risks of death loss and shrinkage are so great that it is good business

to send their steers or mutton sheep and goats to market when they are ready, regardless of ordinary price fluctuations.

Mr. Thomas E. Wilson, President of the Institute of American Meat Packers, in addressing the convention of The Texas and Southwestern Cattle Raisers' Association at Fort Worth on March 15, 1922, apparently intimated that the stockmen are primarily responsible for the gluts and scarcities of livestock on the markets. Under the caption of "Method of Marketing is Unsystematic," he said:

"One of the most pernicious causes of unrest and dissatisfaction in the past has been the prevailing unsystematic method of marketing live stock. There has never been any permanent efficient system regulating the flow of live stock to the market centers. The producers, as a rule, do not attempt to distribute their shipments in accordance with the demand of the consuming public.

"The packers are expected to absorb all that is sent to market at whatever time of whatever quantity, to pay cash on the spot, and then find a quick market for all the products.

"This necessarily adds many complications and problems to the business, causes violent fluctuations and has been the prolific cause of much dissatisfaction.

"The expansion and contraction of labor, equipment and financing necessary to handle business economically under such a system unavoidably produces many difficulties which can only be solved by closer cooperation of the producers in stabilizing receipts at the markets. Stabilization of receipts will tend to stabilize values, and to prevent gluts, and consequent wastes, the elimination of which will operate to the benefit of producer and consumer alike."

A somewhat similar statement was made by Mr. J. Ogden Armour in an article entitled "How the Packers Will Obey the Law," published in *The Farm Journal*, issue of February, 1922.

While Messrs. Wilson and Armour call attention to one of the most important problems encountered in livestock marketing, and while the stockmen can undoubtedly do more than they are now doing toward regulating the flow of livestock to market, it is hardly reasonable to presume that the stockmen have it fully within their power " . . . to distribute their shipments

*in accordance with the demand of the consuming public."* The difficulty is that production and consumption do not ordinarily synchronize so perfectly as that. Conditions over which the ranchmen have little or no control determine the general movement of livestock from the ranches to market. The most important of these are seasonal changes in the condition of the ranges. The quantity and quality of grass necessary for fattening livestock come either in spring or fall and once stockers, feeders or fat stuff are ready to be marketed it is, generally speaking, uneconomical to hold them longer. Not only do they depreciate in weight, quality and additional death losses, but they continue to consume carrying capacity, get in the way of oncoming calf, lamb and kid crops, and over-stock the ranges.

THE PERIODIC WEIGHTS OF CALVES ON THE TEXAS RANCH EXPERIMENT STATION AT SONORA, TEXAS, FROM BIRTH 1921 TO MAY 2, 1922

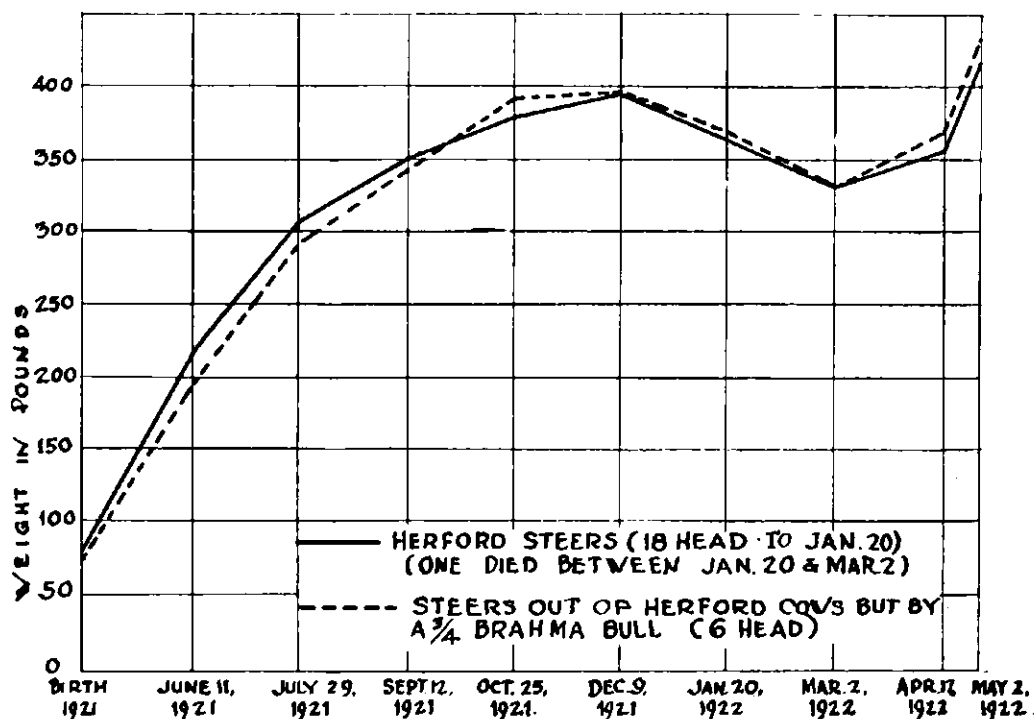


Figure 57.

Courtesy Dr. J. L. Lush, Animal Husbandman, (Genetics), Texas Station.

Figure 57 illustrates the natural limitations confronting the ranchmen in the marketing of their livestock. The peak in weights reached the latter part of October and maintained through November may not always occur just exactly at this

time because of varying weather conditions, but these variations are due to seasonal influences. If the ranchman is planning to sell his calves to the packers, they must be sold at this time. Moreover, the slight gain registered during this period makes it uneconomical to hold such stock off the market after October 25, unless the market is obviously much lower than it should be and is likely to be during the following few weeks. What is true of calves is, in a general way, also true of all types and classes of livestock.

In studying the carrying capacity of the ranges, it has been found that for a ranchman to make the best use of it, he must be rather regular in both his breeding and marketing practices. These are both regulated to a great extent by the seasons. He wants his calves, lambs or kids to be dropped as nearly as possible together, in order that he may have uniformity in the product which he markets. If a man is irregular in the age at which he sells his increase, he will be under-stocked one year and over-stocked a year or two later, unless he buys and sells to fill in. It is best for a ranchman to habitually sell his increase as calves or lambs, yearlings or as two's and if the trend of the markets over several years justifies a change, he should make it gradually and readjust his breeding stock in accordance with his normal carrying capacity.

As a general proposition, in ranching as in farming, the usual crops of a given year should be sold sometime during the year and not held over to compete with the next year's crops for the carrying capacity of the ranges, and also to compete with next year's crops in next year's markets.

#### *Influence of Size of Ranches and of Livestock Run*

The size of ranches and the class of livestock run often determine the time and method of marketing. The small ranchmen keep their ranches stocked with mother stuff to the verge of over-stocking most of the time. They plan to sell their calves, lambs and kids in the fall at weaning time and to wean early in order that their mother animals may get in good flesh before the winter. As a rule their grass is comparatively short by weaning time and weaned calves and lambs lose flesh

rapidly unless put on good pasture. These ranchmen desire to sell at weaning time and they must sell before another crop of calves comes on or become over-stocked. There is only one ranch under four sections in size in Sutton County that has steers one year old and over.

The family sized ranches—those of from 4 to 20 sections—usually keep their steers until they are two's.<sup>121</sup> This practice gives greater elasticity in adjusting the stock to market and range conditions. Normally the owners of these ranches must sell some every year, but they have a little more choice in the matter in that they may choose to sell either steers or calves. On the other hand, they have an additional problem because they must market their steers within a few weeks after they are once in good flesh.

The big ranchmen who graze two-, three- and four-year-old steers have the greatest choice as to what to sell at any particular time, but their product is the most perishable. It is risky to keep a fat four-year-old steer on the range through the winter. Under the best conditions obtainable on the range, he can do little better than regain during the next year the weight which he loses during the intervening winter and early spring. The growth of such a steer is negligible. It is generally conceded that a steer ought not to be kept on the range in this section past four years of age and many think that two or three years should be the limit even for the steer ranches.

Table 90 shows the age at which ranchmen on the different sized ranches plan to market the increase of their cattle.

#### *Lack of Credit May Force Range Livestock on Market*

As pointed out in Chapter XI, on Ranch Credits, ranching lends itself easily to credit financing and, in fact, is financed very largely with credit. In most instances the call of a loan means the marketing of livestock. Statistics for the 97 ranches studied in Sutton County show that over 50 per cent. of the ranchmen are unable to control the time of marketing under financial pressure. If loans are called, livestock must be marketed to meet the obligations. Those who control the credits, therefore, have a potential control over the time at which the livestock is marketed. Loans on range livestock under the **pres-**

TABLE 90

Showing answers to question "At what age do you market the increase of your cattle?"

Groups of Ranches By Sizes	Number of Ranches Studied	Number of Operators Answering Question	Calves	As Steers			
				One Year Old	Two Years Old	Three Years Old	Four Years Old
Total .....	97	96 <sup>122</sup>	52	1	30	22	8
Under 1 section .....	1	1	1	0	0	0	0
1 and under 2 sections ..	10	9	8	1	0	1	0
2 and under 4 sections ..	5	5	5	0	0	0	0
4 and under 8 sections ..	25	25	20	0	3	2	1
8 and under 12 sections .	19	19	7	0	9	6	1
12 and under 20 sections	18	18	6	0	9	5	1
20 and under 32 sections	9	9	4	0	3	3	2
32 sections and above ...	10	10	1	0	6	5	3

<sup>122</sup> Many of the larger operators have different policies for different ranches and years and therefore gave two answers.

ent credit system are made to conform to the needs of commercial banking. Much of the credit comes through livestock banks and cattle loan companies located in the big livestock marketing centers. These loans are very largely dependent on deposits growing out of commercial business.

Conditions of the loan market for cattle paper depend very largely on the size of deposits in these centers which lend heavily on cattle paper. If, for any reason, depositors withdraw large sums from such a bank, it must recall some of its loans to meet the demands. The effect of such a condition is indicated by a letter from the president of one of these banks to a local banker in the range country, written the latter part of September of 1920. It stated that owing to an unprecedented withdrawal of deposits, he would have to call considerable portions of his loans in this particular region. He said, for example, that where ranchmen were able to get a certain stipulated price for calves or steers and who were owing this particular bank money, he advised that such livestock be sold.

**VARIETY AND SEASONAL CHARACTER OF  
RANGE LIVESTOCK SUPPLY***Types and Classes of Range Livestock Marketed*

Each type of range livestock has its peculiar marketing problems. The types marketed from the Sutton County ranges are cattle, sheep and goats. The marketing of each type is complicated by the fact that any one type mentioned may be a sort of by-product of the grazing of one or both of the other two. The man who raises sheep primarily to improve his cattle ranges does not always make price the primary object in disposing of his sheep. He may buy and sell at any time, depending on the needs of his cattle ranges.

In addition to the complications thus arising out of the marketing of different types of livestock, there are problems which result primarily from the marketing of different classes of any given type. It may be said, for example, that old mother cows and aged bulls are the by-products of the steer business. Likewise old ewes and rams and cull ewe lambs are by-products of the sheep business. In any case, not as much care is exercised in the marketing of such classes of animals, and they may often serve to beat down the prices of the classes raised primarily for the market. In order, therefore, to get the best marketing conditions it may be necessary to devise some means for keeping such by-products from competing with the main classes of such stock to be sold.

The particular class of livestock to be sold at any given time will depend primarily upon market conditions for the different classes. The market for mother cows is best as a rule at the time of breeding or just before calving time. The market for steers is the most stable and is fairly good at all times. It is a fact, however, that range steers in the Southwest are usually fat either in the late spring or fall.

The types and classes of livestock to be marketed are modified by drouth conditions. Under such conditions it is usually thought that sheep and goats will maintain themselves on the range longer than cattle and that the first sales to reduce the number of livestock on the range should be the surplus cattle.

In selecting the particular classes of cattle to go, the ranchman has to consider the existing market demands for each class of livestock and the future restocking of his ranges. As a rule he begins with the selling of aged steers. If by selling all his steers he has still not reduced his livestock to the desired point, he begins to sell calves and to cull his mother cows to the limit. In any case, the last livestock to be sold should be the breeding herds.

#### *Time of Marketing Sutton County Livestock*

As a rule goats are marketed first in the spring from Sutton County ranges. The sheep follow shortly afterward and they are in turn followed by the bulk of the cattle. The usual expression of the ranchman is that "The goat market goes to pieces immediately after the sheep begin to appear on the market in large numbers and as soon as steers are fat and begin to crowd the market the prices of sheep decline."

The answers of 76 ranchmen to the question "What determines the time you sell or ship to market?" illustrate the problems confronting the ranchman in the marketing of his products. Sixty-one ranchmen say that the condition of the market is one of the main factors determining the particular time they send their cattle to market. Sixty ranchmen say the condition of the range is an important factor; 20 say that the time they ship to market and what they ship are determined very largely by their creditors. Three ranchmen on the one-section ranches say they simply wait until buyers come to their places.

The bulk of the calves is usually sold in the fall. There are 52 ranchmen who reported as selling steer and cull heifer calves. They all sell in the fall. Some of the calves are sold on the Fort Worth market. The greater portion, however, is sold to local buyers. Men who operate large ranches do not keep as much breeding stock as their pastures will carry in good times. They usually buy calves of the men on small ranches who keep stocked primarily with breeding herds. In the past some calves have been sold to buyers from the coast country. This market, however, has naturally declined in importance because Sutton County is now tick-free territory while the coast



country is not. Most of the animals taken out of the locality go to the ranges farther north. The northward movement will probably increase greatly since Sutton County is now tick-free.

Many lambs are marketed in the fall, especially off the small ranches. Most of those sold go to buyers who expect to

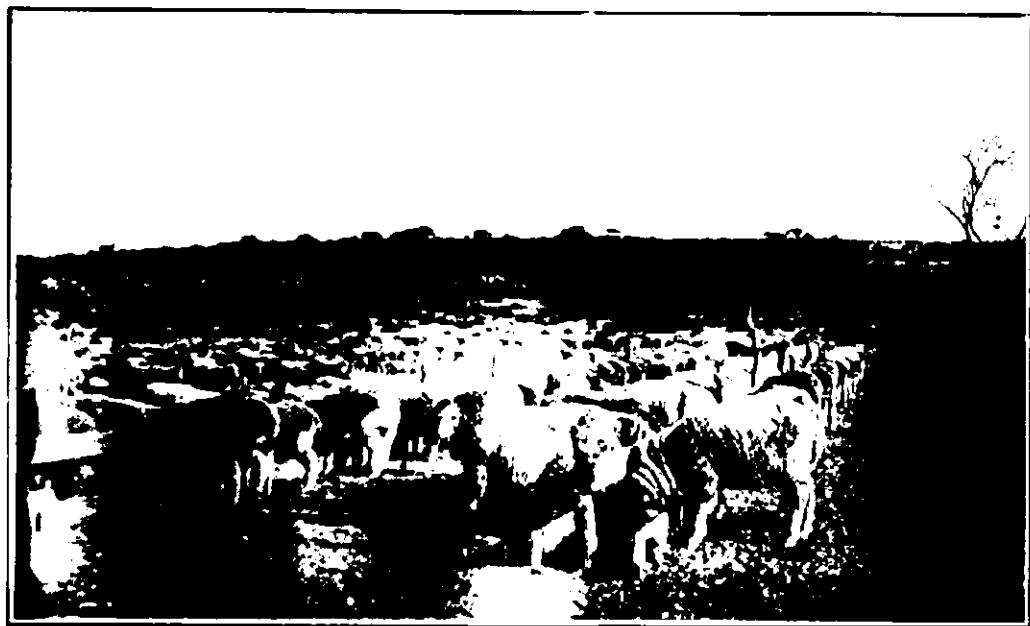


Figure 58. Fattening out muttons on a ranch in Sutton County.

graze and feed them for early spring sale. Some of those sold go north and some of them go to buyers from below Sutton County where the winter weeds and grass together with supplementary feeding with concentrates enable them to put fat range lambs on the market earlier than is possible in any other section of Texas.

The region under consideration grows sheep primarily for the production of wool. Though the dual purpose sheep are growing in favor, it has been and is at the present time rather a fine wool producing region. The mutton sold is considered by some ranchmen at least as a by-product. There are 91 ranchmen, out of 97 from whom records were obtained in Sutton County, who keep sheep. Fifty-five of the 91 have Rambouillets; 17 have merinos; 20 have crosses of Rambouillets with merinos and three have Rambouillets crossed with some other breed.

Mature mutton sheep may be sold either in the spring or fall. The bulk of the sheep sold for slaughter is marketed in the spring. Occasionally sheep get fat enough for slaughter in the fall, but more often they are sold at this time as feeders. It is the object of Texas flock-masters to market their sheep in the late winter or spring ahead of the sheep fed out in the Corn Belt.

Most of the cattle leaving this region for slaughtering purposes leave in the late spring or late fall. The time varies somewhat from year to year due to seasonal variations. If the range is good and the weather favorable, cattle are fattened on grass and sold direct to the packing houses. If for any reason the steers do not get fat enough for killing in the spring, they are either sold to men who graze them in Oklahoma or Kansas or held until fall and if they do not fatten then, they are sold to go to the feedlots.

The feeder market at Fort Worth is poorly developed and the supply is uncertain. In dry years the market is likely to be flooded with steers too poor for economical killing. At such a time, it often happens that the feed supply in Texas is short, due to the same causes, so that the local demand for feeders is light. In the good years, Texas range cattle come to the market in fair killing condition. The same conditions that made the ranges good have usually caused the production of an abundance of feed in the farming sections and hence a considerable demand for feeder cattle. But the purchasers of such cattle are forced to compete with the packers in buying grass-fattened steers.

Table 91 shows receipts at the Fort Worth Stock Yards by months for the year 1921.

TABLE 91

Showing receipts at the Fort Worth Stock Yards by months for the year 1921.

Month	Receipts			Shipped Out		
	Cattle	Calves	Sheep	Cattle	Calves	Sheep
<b>Total 1921 . . . .</b>	<b>578,295</b>	<b>422,158</b>	<b>357,175</b>	<b>250,675</b>	<b>162,732</b>	<b>213,231</b>
January . . . . .	33,580	28,934	10,926	15,703	7,473	4,173
February . . . . .	26,004	10,370	8,431	10,411	2,163	1,779
March . . . . .	35,317	9,265	10,707	16,002	2,423	3,144
April . . . . .	43,665	11,513	44,014	26,922	2,304	26,791
May . . . . .	57,371	21,706	87,947	35,645	11,053	59,607
June . . . . .	48,972	27,380	24,068	21,836	8,518	9,146
July . . . . .	46,274	41,815	30,817	14,134	14,929	12,442
August . . . . .	76,653	57,646	35,995	29,784	20,171	23,150
September . . . . .	51,513	71,800	17,033	18,844	25,922	7,948
October . . . . .	65,058	67,592	32,391	24,740	29,512	22,796
November . . . . .	61,596	50,549	20,797	24,288	26,152	14,423
December . . . . .	32,302	23,588	34,049	12,366	12,112	29,832
<b>Total 1920 . . . .</b>	<b>894,875</b>	<b>291,565</b>	<b>295,423</b>	<b>487,532</b>	<b>65,642</b>	<b>210,238</b>

AVERAGE RECEIPTS OF CATTLE ON THE  
FORT WORTH MARKET BY MONTHS FOR THE  
YEARS 1903 TO 1920 INCLUSIVE

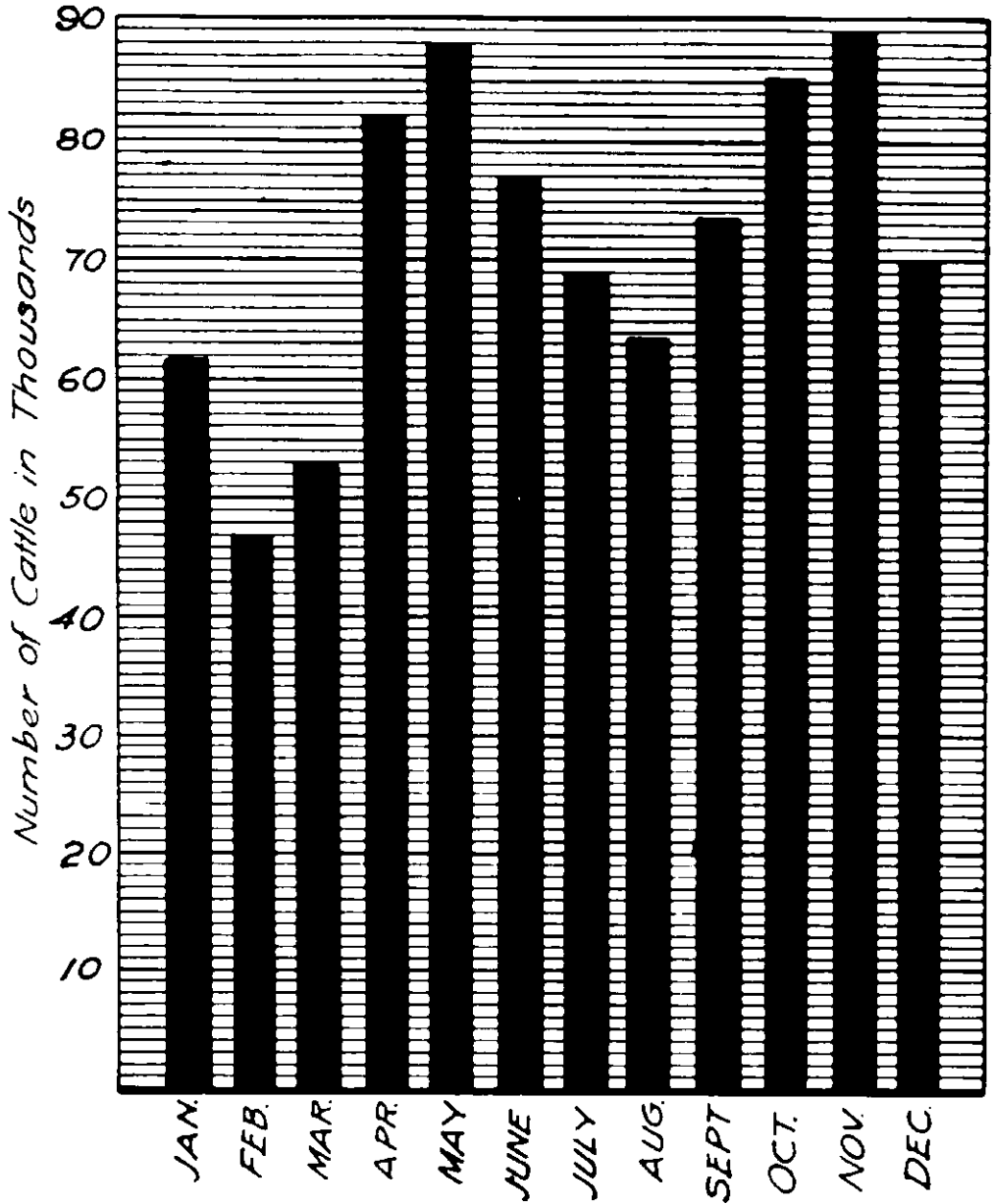


Figure 59.

The year 1921 does not show the normal movement of cattle into Fort Worth. The large shipments in August may be partly explained by strained credit conditions, but more espe-

AVERAGE RECEIPTS OF SHEEP ON THE FORT WORTH MARKET BY MONTHS FOR THE YEARS 1903 TO 1920 INCLUSIVE

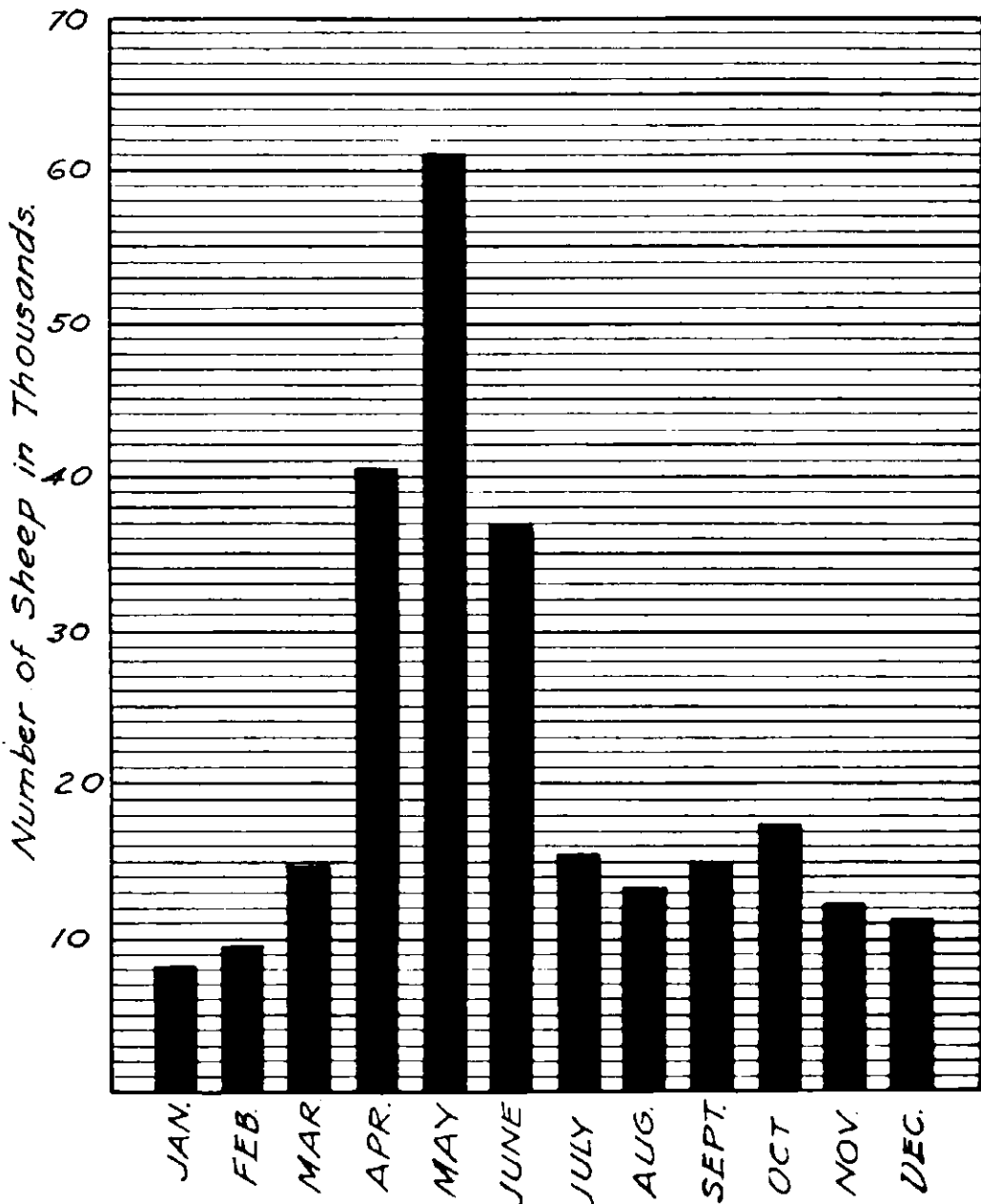


Figure 60.

cially by the drouth conditions prevailing over many portions of the trade territory.

Figure 59 shows the average receipts on the Fort Worth

THE NUMBER OF CARLOADS OF CATTLE RECEIVED ON THE FORT WORTH MARKET BY MONTHS FOR THE YEAR 1921, THE NUMBER KILLED AND THE NUMBER RESHIPPIED

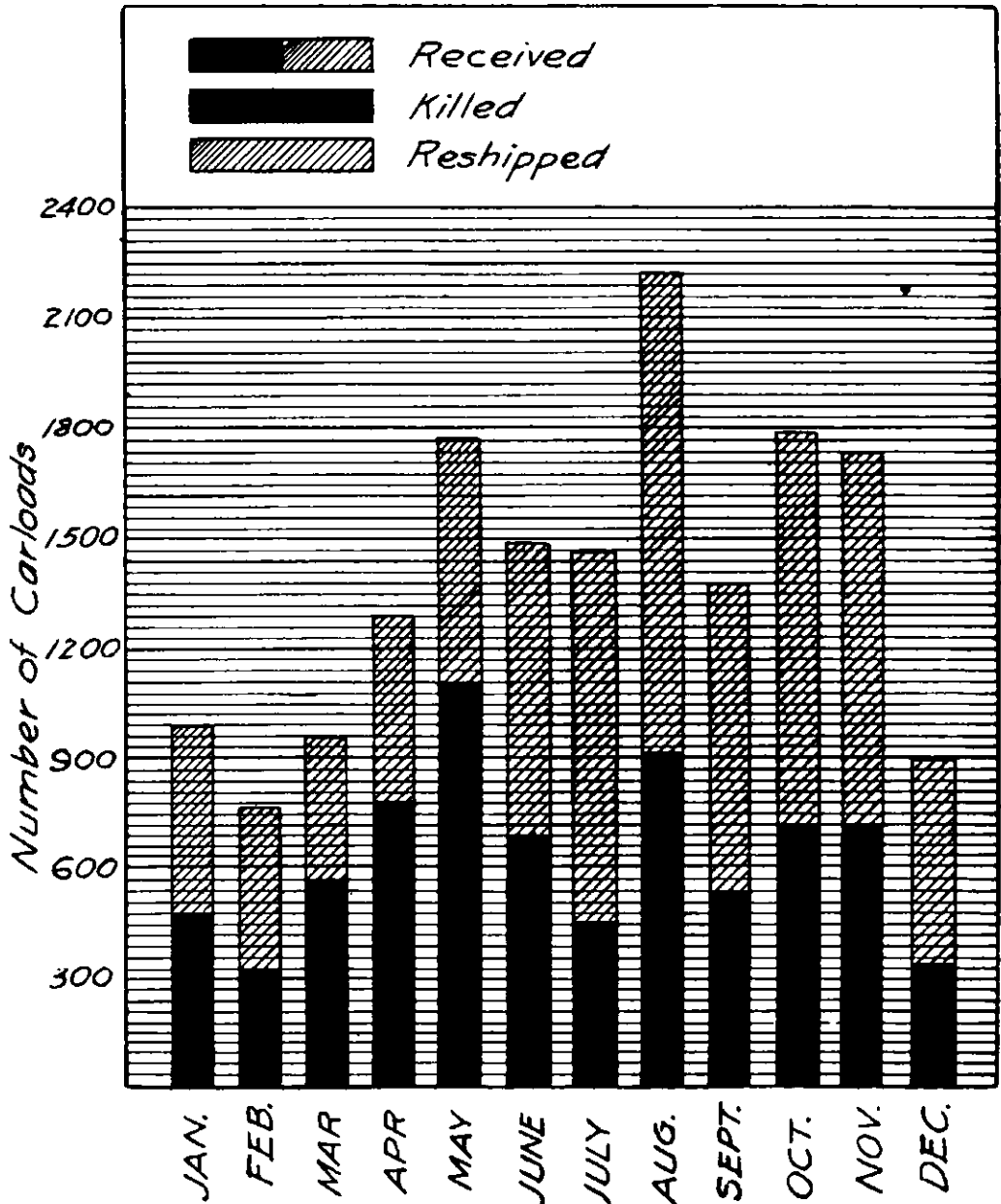


Figure 61.

market for the eighteen years from 1903 to 1920 inclusive. These figures bring out clearly the seasonal character of the

THE NUMBER OF CARLOADS OF SHEEP RECEIVED ON THE FORT WORTH MARKET BY MONTHS FOR THE YEAR 1921. THE NUMBER KILLED AND THE NUMBER RESHIPPIED.

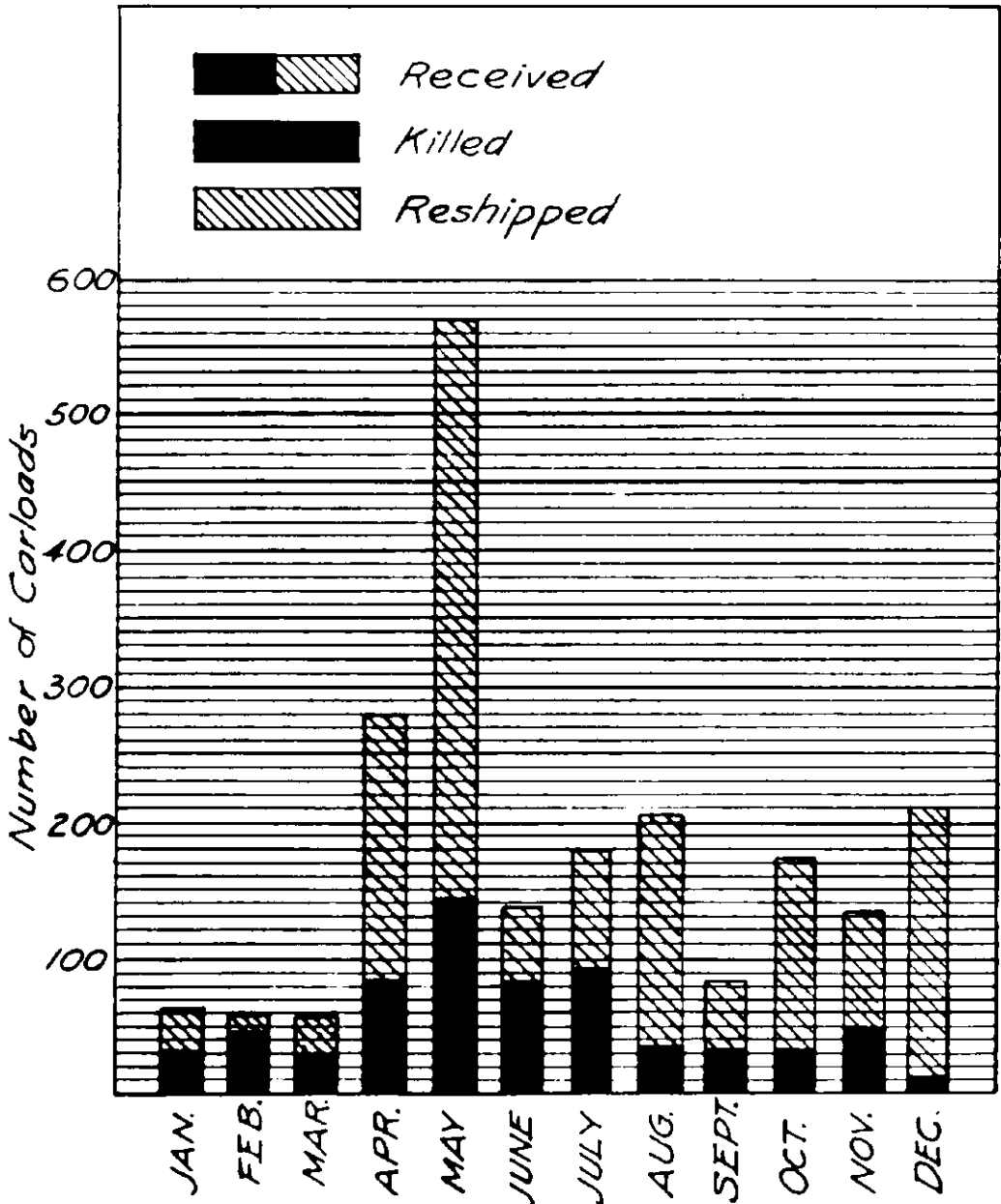


Figure 62.

cattle supply. The figures for 1921 show that this may be modified, but that it is a result of abnormal conditions which are opposed to the best interests of the cattle business.

Figure 60 shows the average receipts of sheep on the Fort Worth market for the eighteen years from 1903 to 1920 inclusive. These figures show that the duration of the sheep market for the Fort Worth district is confined almost exclusively to not more than three months, in the spring of the year.

Figures 61 and 62 show the receipts and reshipments of cattle and sheep on the Fort Worth market during the year 1921.

### *Age at Which Different Types and Classes of Livestock are Marketed*

There is much irregularity as to the ages at which goats are sold, because of the rather violent fluctuations in the prices of both goat meat<sup>123</sup> and mohair. If the price of goat meat is attractive and that of mohair dull, goats go to the market in large numbers as kids or yearlings. If on the other hand the price of mohair is attractive, goats are likely to be kept until they are four or five years old. Likewise mutton sheep are likely to go to market as lambs, culled ewes and rams. Sheep

<sup>123</sup> For some years the goat raisers of the country have wanted a name for goat meat comparable to beef, mutton, pork, veal and the like. It has been thought that goat meat, one of the most ancient and, with many, the most popular articles of diet, has been unduly depressed in the minds of many people and, therefore, in the markets, because of a certain amount of odium attached to it by suggestion and jest which seems to have run pretty well through history. No one familiar with kid meat, however, as prepared by the good housewives of the ranchmen or as served at the Western barbecues will deny the fact that kid is one of the most delicate and palatable of meats.

Early in 1922, Mr. James T. Elliott, Editor and Publisher of *The Sheep and Goat Raisers Magazine*, of San Angelo, Texas, in discussing this matter with Hon. F. M. Halbert, a prominent Angora goat breeder of Sonora, suggested that Mr. Halbert offer a prize to the person submitting the most acceptable name for goat meat. Accordingly Mr. Halbert offered a choice registered Angora buck to the person suggesting the best name.

A special committee was appointed by Mr. Elliott, consisting of R. H. Martin, President of the Sheep and Goat Raisers' Association of Texas, Del Rio; Robert Davis, President of the American Angora Goat Breeders' Association, Rio Frio; P. Youngblood, Director of the Texas Agricultural Experiment Station of the Agricultural and Mechanical College of Texas, College Station; Jack Turner, President of the National Angora Record Association, Junction; and Claude A. Broome, Chairman of the Show and Sales Committee of the Sheep and Goat Raisers' Association of Texas, San Angelo.

On June 28, 1922, at San Angelo, during the annual convention of the Sheep and Goat Raisers' Association of Texas, and after a careful consideration of nearly 2500 names, sent in from practically every part of the United States, this committee adopted the name *chevon* to designate the meat of the goat. This refers to meat of the goat above the kid age. It was not intended that this name should take the place of the word "kid" which designates the meat of the young goat.

The word "chevon" is a contraction of the two French words *chevres*, meaning goat, and *mouton*, from which we get our word mutton. The suggestion was made by Mrs. E. W. Hardgraves, a ranchwoman, of Sanderson, Texas. The name was adopted by the Sheep and Goat Raisers' Association of Texas and other organizations.



raised primarily for wool are usually sheared for two to four years and then marketed as aged muttons.

Up to the present, Sutton County has been primarily a wool-producing section, but now considerable attention is being paid to the value of the sheep as mutton. The relative prices of wool and mutton have much to do with placing emphasis on mutton or wool and, therefore, with the ages at which sheep are marketed.

The present survey was made following a period of high wool prices. Forty-six of the ranchmen who have sheep reported on the ages of their muttons. Three of these had none more than two years old; 10 had them from two to three years old; 29 had them from three to four years old; three had them from four to five years old, and one ranchman had some over five years old.

There is considerable variation in the ages at which the different classes of cattle leave the ranches. Old bulls and cows go to market after they have served their period of usefulness as breeders. Their selling age varies from four to ten or twelve years. Non-breeders and off types are the first to go, while good mother cows are held the longest. Formerly the practice in this region was to sell aged steers, but now most of the ranchmen sell calves. Only the men operating the larger ranches, who buy calves from the smaller ranches, now hold steers till they are yearlings, two's or three's. The general tendency of the ranchmen, however, is toward sending younger stock to market. That this tendency is economically correct, and therefore, in the right direction is verified by both nutrition data and recent marketing experiences.

Table 92 shows the ages at which ranchmen prefer to market their mother cows.

TABLE 92

Showing answers to question "At what age do you market cows?"

Groups of Ranches By Sizes	Number of Ranches Studied	Answers to Question "At what age do you market cows?"				
		Number of Operators Answering Question	Under Eight Years	Eight and Under Ten Years	Ten and Under Twelve Years	Twelve Years and Over
Total .....	97	86 <sup>124</sup>	16	57	23	6
Under 1 section .....	1	0	0	0	0	0
1 and under 2 sections .....	10	6	1	5	4	3
2 and under 4 sections .....	5	5	1	3	1	0
4 and under 8 sections .....	25	22	3	10	6	2
8 and under 12 sections .....	19	16	3	12	4	0
12 and under 20 sections .....	18	18	5	13	1	0
20 and under 32 sections .....	9	9	3	7	4	0
32 sections and above .....	10	10	0	7	3	1

<sup>124</sup> Three operators report cows marketed at no special time, and the answers of sixteen operators appear in two columns.

Table 93 indicates at what season Sutton County ranchmen prefer to market steers.

TABLE 93

Showing answers given by ranch operators to the question "At what season do you market steers?"

Groups of Ranches By Sizes	Number of Ranches Studied	Answers to Question "At what season do you market steers?"				
		Number of Operators Answering Question	Answers Classified			
			Spring	Fall	Spring and Fall	Summer and Fall
Total .....	97	30	3	20	5	2
Under 1 section .....	1	0	0	0	0	0
1 and under 2 sections .....	10	1	0	0	1	0
2 and under 4 sections .....	5	0	0	0	0	0
4 and under 8 sections .....	25	4	1	2	1	0
8 and under 12 sections .....	19	11	1	9	1	0
12 and under 20 sections .....	18	6	0	3	2	1
20 and under 32 sections .....	9	4	0	3	0	1
32 sections and above .....	10	4	1	3	0	0

Table 94 indicates the age at which Sutton County ranchmen prefer to market steers.

TABLE 94

Showing answers given by ranch operators to the question "At what age do you market steers?"

Groups of Ranches By Sizes	Number of Ranches Studied	Answers to Question "At what age do you market steers?"				
		Number of Operators Answering Question	Answers Classified			
			One Year Old	Two Years Old	Three Years Old	Four Years Old
Total .....	97	47 <sup>125</sup>	3	32	22	9
Under 1 section .....	1	0	0	0	0	0
1 and under 2 sections .....	10	3	2	2	1	1
2 and under 4 sections .....	5	0	0	0	0	0
4 and under 8 sections .....	25	5	0	3	2	1
8 and under 12 sections .....	19	13	1	9	6	1
12 and under 20 sections ...	18	12	0	9	5	1
20 and under 32 sections ...	9	5	0	3	3	2
32 sections and above .....	10	9	0	6	5	3

125 The answers of eight operators appear in more than one column.

Most of the trading in mother cattle takes place in the early fall as "bred stuff" or in the early spring as "heavy stuff." The ranchmen do a great deal of buying and selling for future delivery. Lambs, kids and calves are often bought in the spring and summer for fall delivery, usually September.

## THE LIVESTOCK MARKETING PROCESS

### *Local Marketing*

Most of the beef supply of the Sonora community is bought and slaughtered locally, but the numbers sold for local slaughter are insignificant compared to the numbers grown in Sutton County or in the trade territory of Sonora.

Most of the raisers of livestock in Sutton County sell to local buyers. Out of 91 ranchmen reporting, 82 per cent. say that they sell to local buyers who are either neighboring ranchmen or local commission men. Nine others say they sell partly to local buyers and ship a part of their livestock. Four ranchmen ship as a rule and three always ship their livestock to market.

The men on small ranches usually sell their livestock to the men with larger ranches who plan to graze the animals a year or two before selling. The men on the medium sized ranches may buy calves from the small ranches and shape up a herd to graze a year and then resell to the larger operators who graze them a season before marketing them. In this way the men on the big ranches, or steer men, market the larger part of everything that goes out. They thus form an important link in the present marketing chain. They furnish a market for the products of the small ranches and assume a large part of the risk in the marketing process.

There are also some men on medium sized ranches who, instead of devoting themselves exclusively to stock raising, buy and sell whenever they think they can make a profit. These men are risk-takers. They keep on hand some ready money with which to pick up livestock under more or less forced sale due to lack of adequate credit, grass or some other cause. They may buy to resell to other ranchmen or to ship to a central market.

Cattle buyers often come into the country to shape up bunches of steers to be put on pasture in other regions. If the prices offered seem attractive, they go from ranch to ranch until they have as many animals as they desire.

Bargaining is usually done on the basis of quality. A buyer, for example, may announce that he is paying \$25.00 per head for good steer calves. He may offer to take the entire supply of a man who has unusually good cattle. Out of another herd, however, he may demand a 10 per cent. "cut back" and if a man has unusually poor stuff, he may offer to "top out" say only fifty per cent. of the steer calves. The object of such buyers is to make up a drove which will be as near uniform as possible. If the buyer is seeking breeding stock, he often wishes to "top" a herd. In such cases the seller usually reserves a certain number and permits the buyer to "top" the remainder.

Where cattle are sold locally, prices are figured on the basis of those of the central markets less transportation costs and commissions or profits. It may actually be that the sale price is above or below the central market price, depending on the

respective bargaining powers of the buyers and sellers. The prices of breeding stock are determined by the quality and breeding of the individuals to be sold.

The cattle and other livestock shipped out of the country are thus collected into fairly large herds or flocks either by big operators or speculators. These animals are more or less classified depending upon the number shipped. If it is a small operator he may send steers, cows and heifers all in one car. The big operators are able to make a better classification and thus command a better price.



Figure 62. On the trail from the ranch to the shipping point.  
(Photo Courtesy Professor R. H. Williams, Tucson, Arizona).

### *Problems of Getting Range Livestock to Central Markets*

*Driving from Ranch to Shipping Point:* The driving of livestock from the ranch to the shipping point often presents many serious difficulties. The seriousness of the problem depends upon such factors as the number of miles the animals must be driven, the availability of feed and water along the route and whether they are compelled to go through lanes or are permitted to graze through pastures. There are 75 ranch-

men in Sutton County who reported the distance they have to drive their livestock to reach the railroad. There are seven who drive less than 50 miles; 22 who drive from 50 to 75 miles; 34 who drive from 75 to 100 miles, and 12 who drive 100 miles or more.

The long distance would be almost prohibitive were it not for the fact that ranchmen can usually find water and pasture which they can rent for their livestock during nights. The lanes are often made much wider than in the farming country, some being 300 feet wide. Some of the railroads have made special arrangements to furnish grass and water to their patrons by buying and improving a section of land about every eight or ten miles along the main route. A man is supposed to stop only one night in any one of these section "traps." No charges are made for their use provided the cattle are shipped over the railroad providing them. Before a man starts to market he usually ascertains whether or not there is going to be any one else on the road at the same time. They plan to strike the trail in such a way that two herds will not come to any particular camping ground the same night.

The amount of shrinkage due to the drive to the railroad depends on the type and class of livestock, the distance the animals are driven and the feed and water accommodations along the route.

No accurate data were obtainable on shrinkage or injuries. Few ranchmen have scales on their ranches and there are none convenient at the shipping stations. Thompson Brothers in Schleicher County, however, have scales. They weighed out a shipment as shown in the following quotation from a letter received from them: "We recently shipped 52 Hf. Yearlings. Two or three days before making shipment we weighed 25 of them before starting from our ranch, which is 8 miles from Eldorado. They weighed on an average 603 at this end. The 52 head averaged in Fort Worth 565 pounds each." The cattle were driven about 50 miles from the ranch to the shipping point. It is about a 12 hours' run from the shipping point to Fort Worth. The cattle were loaded and shipped promptly.

It is generally conceded that the bulk of the shrinkage and other losses occur between the ranch and the shipping point.

As long as there was open range these losses were inconsiderable. In fact livestock often fattened on the way to market. Even now if a man happens to get on the road when the weather is favorable and he is lucky in finding ample grass and water on the way, he may deliver his animals at the railroad in almost as good condition as they were when they left the ranch.

It is a fact, however, that the difficulties of getting cattle to the shipping points are increasing each year. Lanes are increasing in numbers, ranchmen along trail routes are discriminating more and more as to whom they will furnish accommodations and the price of these accommodations continues to rise. Unless railroad facilities are extended, the problem of getting livestock to market from parts of Sutton County will become extremely serious.

The long distance which livestock has to be driven to market prevents the sale of veal calves. The only way to get such animals to market would be to drive them with their mothers to the railroad or haul them in trucks. The difficulties of such a procedure are obvious.

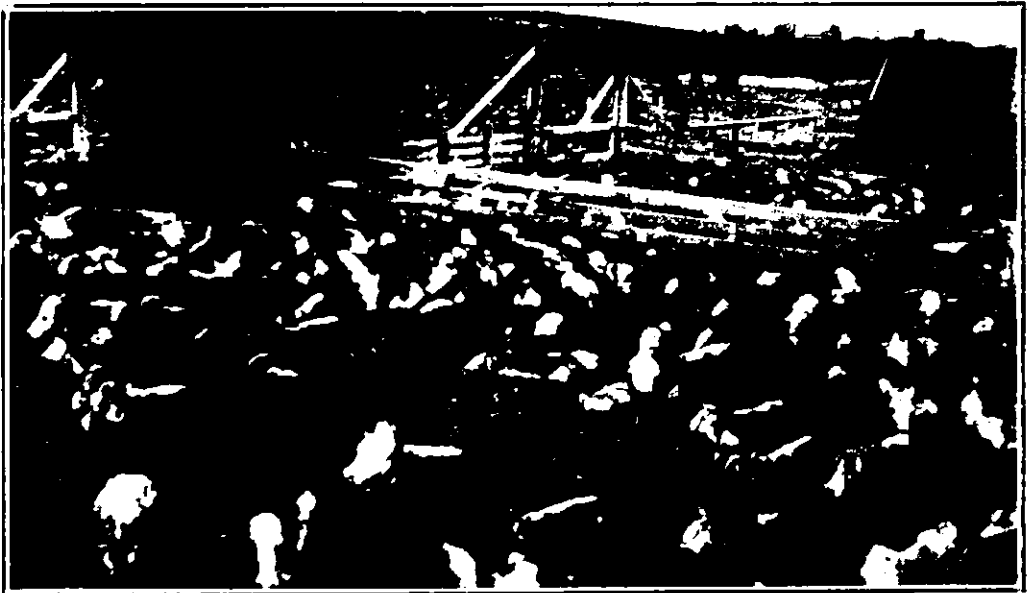


Figure 64. Cattle often grow stale in crowded pens pending shipment to the feedlots. (Photograph courtesy Professor R. H. Williams, Tucson, Arizona.)

*Shipping Problems:* The problem of getting cars at exactly the right time is rather a difficult one. The ranchman telephones to the local railroad agent when he plans to ship his cattle and tells him the number of cars needed. It is the business of the local agent to provide them. If it is impossible to secure them, he notifies the shipper before leaving the ranch with the livestock. Under present conditions it is often impossible to know 24 hours ahead, however, whether or not cars will be available. The ranchman who lives 75 miles or more from the station is either compelled to start before the cars are secured or to pay demurrage charges. If ranchmen live less than 50 miles from the station they can usually start their livestock to the shipping point after the delivery of the cars is assured.

Once in the cars the greater part of the work of getting to the central market is done for it is only 18 hours' run to Fort Worth from shipping points available to most Sutton County shippers. The animals have neither to be fed nor watered enroute. Ordinarily the shippers either go or send some one with their livestock to market. The animals are, however, practically beyond the control of the ranchmen once they are loaded into the cars and billed to some commission company.

### *Shipping Through One Central Market to Another*

All livestock shipped out of Sutton County for killing purposes and most that goes as feeders is consigned to or through livestock commission companies. Ranchmen often bill their livestock to a firm in Kansas City or some other point with stop-over privileges at Fort Worth. If the market at Fort Worth appears to be as good as any available, the livestock is sold and freight paid to Fort Worth with a small additional fee for the stopover privilege.

### *Selling Livestock on the Central Markets*

*Agencies Which Aid in Bringing Livestock to the Point of Sale:* The marketing of livestock is a process which involves many different activities. In the first place, there are those which are concerned primarily in getting the livestock to the point at which it is bargained upon. The chief agencies ren-



dering these services are the railroads, the stockyards companies, the commission companies and agencies of information such as livestock reporters.

The Fort Worth Belt Railway is the receiving agent of all the different railroads entering Fort Worth. Its business is to gather the cars of livestock as they come into the city and place them at unloading pens in the stockyards. When livestock is billed from some outlying place to a commission company, the bill-of-lading is turned over to the Stockyards Company which in turn informs the Fort Worth Belt Railway where to deliver the cars.

The Stockyards Company is also an important agency in the process of getting livestock in position for the bargaining process. Its main functions are unloading, driving to pens, feeding and watering, removal of dead animals and trash and informing the commission companies as to when and where their consignments are delivered. It meets the Fort Worth Belt Railway at the unloading pens and takes charge of the car or cars and the livestock. It has a force whose sole business is to look after the unloading of cars. It has a crew for unloading sheep and goats, one for hogs and one or two for cattle. The animals are first counted as they come out of the cars and after they are out and in the unloading pens they are counted again and delivered to the pens of the commission companies to which they are consigned.

When the livestock is thus delivered in the pens of the particular commission company, the Stockyards Company is given orders as to the amount of feed desired and it proceeds to deliver it at the pens.

After the livestock has been sold or for any reason taken out of the pens, it is the business of the Stockyards Company to clean up the pens as quickly as possible.

Under the present system of marketing, the commission companies play a large part in bringing livestock to the selling points. In fact, there are relatively few animals sold on the Fort Worth market except through them.

A commission company has several departments in its organization. One force of men is concerned primarily with getting cattle ready for sale. These men are called *yardsmen*.

It is their business to see that the cattle take as great a fill as possible and to class and show them off. Every company is supposed to have at least three salesmen, one for cattle, one for sheep and goats, and one for hogs. Some of the big companies may specialize still further by having one salesman for steers, another for stock cattle, and so forth.

In addition to their selling forces these companies may have men who devote their time to buying. If it is a place where large numbers of feeders are bought, the buying force may be almost as large as the selling. In some markets the same man may be both a seller and a buyer.

Some of the companies have traffic and credit departments, and all have more or less elaborate bookkeeping departments.

The commission companies also maintain lines of communication through which they hope to secure the stockmen's business and aid them in marketing to best advantage. These activities are often grouped under what is termed a publicity department.

*Analysis of the Sales Process:* A sale is the result of bargaining between those who have livestock for sale—the supply side—and those who wish to buy—the demand side. The supply side is represented by the commission companies and speculators. The livestock on the ranges and farms constitutes the potential supply and exerts its influence on the market through the agencies of information. The packer buyers, buyers of feeders and stockers, and speculators constitute the demand side for livestock ready for immediate delivery. The potential demand is governed by the relative desirableness of meat as a diet and the abundance of facilities for meat production.

The first concern of the commission man is to get as many buyers bidding on what he has for sale as possible. Since the commission company has no facilities for holding livestock off the market once it reaches the stockyards, its service lies in its ability to find as many opportunities to dispose of the supply as possible within a very short time.

The commission company salesman develops much skill and rapidity in making sales. Knowing the strength of the market fairly well, he knows about when he is offered top prices. As a rule it may be said that commission salesmen accept the first

bid they think approximates the top for the livestock being sold. They are often afraid not to do so because they must make room for incoming shipments and it may be impossible to get buyers, especially packers, to make second bids. On the other hand the commission companies are not always able to judge accurately the strength of the market, so they may make sales of several cars before the higgling brings out its real strength.

Ordinarily the speculator is a closer bargainer than the commission man. In fact some of the commission men admit that the speculator is often able to get more for a car of cattle than they, both because he is in a position to hold over from day to day and is able to classify and present his stuff on the market in ways that the commission man is unable to do.

The movement of the supply is governed to a very large extent by the daily price movements. A sharp upturn in price may stimulate a movement from the ranches to the markets. The ranchmen are thus tempted to rush an undue supply of livestock, often of inferior quality, to market and depress prices which in turn checks the shipments and produces another advance in price which again stimulates a rush to the market.

*The Demand Side of the Market:* In the bargaining process, the demand side of the market is represented by the large and small packers, commission buyers, feeder and stocker buyers, speculators and scalpers. The main factor, however, on the demand side is the big packer. The prices offered by the others are very largely governed by the bids made by the packer buyers. If more cattle come to market than the two packing companies at Fort Worth can absorb and thus prices tend to decline, buyers from other packing centers come into the market and buy at a price which enables them to reship to another market. Ranchmen who reship from a low to a high market often lose money by not reaching there until there is a drop in prices, occasioned by many others making a similar run for the high market. Of the eight ranchmen in Sutton County who had reshipped from one market to another, six said they had lost money and two said they about broke even.

The speculator is on the demand side of the market as often as he is on the supply side. If the prices at any particular

time appear to be abnormally low, he buys with the hope of selling at an advance. In many instances he also hopes to be able to reclassify the stuff bought so as to make it present a better appearance on the market and, therefore, increase its value. On a high market, he is usually on the supply side and on a low market he is on the demand side.

The outside buyer may be a farmer or a ranchman who wishes to buy feeders or stockers, or a representative of some small packing company located in a nearby town or city. These buyers, however, may be a strong factor one day and out of the market the next.

The sale of livestock at the central market is completed when it goes over the stockyards company's scales or when the stock bought by ranchmen, farmers and other outside buyers is billed for shipment out of the yards. The seller bears all expenses of marketing until the livestock is weighed. The animals are marked as they go over the scales as the property of the purchaser and all payments are made on the basis of the market classes, numbers and weights.

*Expenses of Marketing:*<sup>126</sup> The different agencies concerned with the marketing of livestock must be paid for their services. The usual expenses of marketing livestock on the central market may be summarized as follows: The charges of the Fort Worth Belt Railway are absorbed in the railroad charges from the point of shipment. No figures were secured as to the amount charged by the Belt Railway, but during the war this charge had to be made separate and was \$4.00 per car. A straight charge included the delivery at only one point. Thus, if a mixed car of livestock was sent to the Fort Worth market and had to be delivered at two unloading points, then \$1.00 extra for each delivery above the first was charged.

The Stockyards Company charges \$1.00 per car for unloading and delivery to the pens of the commission companies. The Stockyards Company furnishes feed and water at prices fixed by it. At the time the survey was made the charge was \$1.05 per bale for prairie hay. It also cleans up the pens and has as its property all dead animals and other waste. It owns the scales and makes a charge of 60 cents per car for weighing.

The charges of the commission company are on a *per car basis* if delivered in straight carlots. If in mixed carlots, the charges are on a *per animal basis*. The charges of one commission company at the time the survey was made were as follows:

	Per head	Minimum		Maximum
Steers	.....75c.....	\$12.00	per car	.....\$18.00 per car
Cows	.....60c.....	12.00	per car	.....18.00 " "
Calves	.....30c.....	12.00	per car	.....18.00 " "
Hogs	.....25c.....	8.00	per car	.....12.00 " "
Sheep	.....15c.....	8.00	S/D	.....12.00 S/D.

The charges made by the commission companies for buying are usually about the same as for selling. Should a commission company sell Ranchman B's steers to Farmer A for feeders, Farmer A pays a buying commission and Ranchman B a selling commission.

In order to give the reader a better understanding of the amounts and varieties of expense incurred by a commission company the expenditures of a typical one are given in Table 95 following.

TABLE 95  
Showing expenditures of a livestock commission company for calendar year 1918 127

Month	Salaries	Donations	Meals	Postage	Telephone	Rent	Supplies	Daily Papers	Advertisement
Total . . . . .	\$34720.26	\$238.50	\$1791.01	\$2360	\$2547.49	\$1200	\$332.01	\$1227.70	\$1396.88
January . . . . .	2977.34	5.00	132.30	75	210.10	100	7.53	98.00	45.75
February . . . . .	2953.32	27.00	133.15	510	206.52	100	22.80	123.23	158.74
March . . . . .	2829.22	25.00	106.81	150	186.82	100	9.00	98.20	75.67
April . . . . .	2978.32	5.00	108.70	200	185.14	100	114.00	120.25	124.52
May . . . . .	2978.32	125.00	98.75	125	205.98	100	12.63	109.57	131.57
June . . . . .	2988.32	0	99.30	150	233.07	100	24.75	108.95	94.00
July . . . . .	3023.32	0	121.55	175	222.45	100	67.30	103.24	90.45
August . . . . .	2903.82	6.00	179.09	175	222.72	100	34.75	95.65	63.72
September . . . . .	3072.32	25.00	172.63	500	188.83	100	18.50	101.34	170.29
October . . . . .	2608.32	1.00	208.63	100	225.08	100	10.95	83.26	243.25
November . . . . .	2653.32	2.00	229.18	100	206.14	100	6.15	93.65	164.96
December . . . . .	2753.32	17.50	200.92	100	254.64	100	3.65	92.36	33.96

127 This company has a capital stock of \$25,000. Its gross profit for this year, 1918, was \$60,000. Its gross expenses for salaries and other charges were \$51,000.

The following are the charges made by this same livestock commission company at the present time (June, 1922) :

“SCHEDULE OF RATES AND CHARGES

Effective January 1, 1922

by

—————Livestock Commission Company  
at Fort Worth Stock Yards  
Fort Worth, Texas.

For selling:

(1)

Unmixed livestock in carlots—one owner;  
Cattle and Calves One Species:

Cattle: 75c each; \$12.00 minimum; \$18.00 maximum.

Calves: 35c each; \$12.00 minimum; \$18.00 maximum; doubledeck \$30.00 maximum.

Hogs: 30c each; \$8.00 minimum; \$12.00 maximum; doubledeck \$20.00 maximum.

Sheep or Goats: 20c each; \$8.00 minimum; \$12.00 maximum; doubledeck \$20.00 maximum.

Those in singledecks where doubledeck freight rates apply, doubledeck rates.

(2)

Mixed Livestock in Singledeck Cars—One Owner;  
Cattle and Calves One Species.

Cattle: 75c each; \$18.00 maximum for cattle in car.

Calves: 35c each; \$18.00 maximum for calves in car.

Hogs: 30c each; \$12.00 maximum for hogs in car.

Sheep or Goats: 20c each; \$12.00 maximum for sheep or goats in car.

Total charge on mixed car \$12.00 minimum; \$20.00 maximum.

Mixed Livestock in Doubledeck Cars—one owner.

Calves: 35c each; \$30.00 maximum for calves in car.

Hogs: 30c each; \$20.00 maximum for hogs in car.

Sheep or Goats: 20c each; \$20.00 maximum for sheep or goats in car; minimum per car; maximum \$30.00.

(3)

Unmixed Livestock in carlots—two or more owners:

Cattle: 75c per head; \$12.00 minimum; \$25.00 maximum.

Calves: 35c per head; \$12.00 minimum; \$25.00 maximum.

Hogs: 30c per head; \$18.00 maximum; doubledeck \$25.00.

Sheep or Goats: In singledecks 20c per head; two owners \$15.00 maximum; three or more owners \$20.00 maximum; in doubledecks 20c each; two owners \$23.00 maximum; three or more owners \$28.00 maximum.

Mixed Livestock in carlots—two or more owners: Same rates per head with \$27.00 maximum. (Cattle and Calves one species).

No one owner shall pay more than the maximum commission on carloads as provided in paragraphs (1) and (2).

(4)

Livestock Hauled or Driven In:

Cattle: 75c each.

Calves: 35c each.

Hogs: 30c each.

Sheep or Goats: 20c each.

In the case of stock sold for one owner at one time of as many or more head or aggregate weight as would constitute a carload if shipped in the per car rates may apply.

(5)

Purchasing Livestock—Carload lots:

Cattle: 75c each; Calves 35c each; \$12.00 minimum; \$18.00 maximum.

Hogs: 30c each; singledeck \$12.00 maximum; doubledeck \$20.00 maximum.

Sheep or Goats: 20c each; singledeck \$12.00 maximum; doubledeck \$20.00 maximum.

For clearing out of stockyards livestock not consigned to or sold by clearing agency to party for whom cleared, one-third of the charge under this Section except that this charge may be waived as to cattle for exhibitions.

(6)

Clearing for Yard Traders or Dealers:

Cattle and Calves: 10c per head.

Hogs: 5c per head.

Sheep or Goats: 3c per head.

(7)

For Selling or Purchasing:

Registered Cattle for breeding purposes: \$5.00 per head.

Grade Cattle for breeding purposes: \$2.50 per head.

Registered or Grade Cattle for beef at exhibition in less than carloads: \$1.00 per head.

Calves at exhibitions at the rate for cattle per head or per car.

(8)

Less than carloads at stated rates per head.

(9)

No charge for calf sold with mother.

(10)

For the resale of any livestock which have been purchased on or in stockyards and remaining therein, one-half the rates or charges provided in this schedule."



Many of the expenses listed in Table 95 may seem extravagant at first glance, but nevertheless they are expenses incurred in an attempt to serve the ranchman in a way that will satisfy him. The commission company must keep actively in touch by mail or telegraph or telephone with its customers and supply them with available market information. There are doubtless some items in this expense account that could be and probably should be eliminated. But under the present conditions it is practically impossible to eliminate any of them unless all the commission companies agree to the elimination, and it is claimed that under the present State laws the companies would be subject to fines by making such an agreement.

LATER: Since the passage of the Packers and Stockyards Act, most of the non-essential expenses of the commission companies have been eliminated. Their elimination should prove to be an advantage to both the commission companies and the stockmen. The following circular, sent out by commission companies to their patrons, explains the expenses eliminated:

*"To the Trade*

"The following rules and regulations have been incorporated in and made a part of the schedule of rates and charges for stock yards, in compliance with the Packers and Stock Yards Act, and under which all Commission Companies are required to register and operate. These rules are effective April 1, 1922.

I

"No company shall pay for or furnish, directly or indirectly, meals or lodging to shippers, or prospective buyers, or their employees or friends, at, or in the vicinity of the stock yards.

II

"Nor pay for or furnish to any shipper, or prospective shipper, any livestock paper or other newspaper or publication quoting livestock markets, but this shall not extend to or include a daily, semi-weekly or weekly market letter, sent by commission companies on their own account, or by joint action of two or more companies.

## III

“Nor give or furnish to any shipper, or prospective shipper, directly or indirectly, any presents in the form of wearing apparel, theatre tickets or other thing of usefulness or value, but this shall not be construed to embrace or include things of a trifling or nominal value such as calendars, memoranda books, pencils and other advertising novelties.

## IV

“Nor pay for or furnish free of cost, whether upon request or otherwise, telegraph or telephone messages asking for the market, quoting or giving the market, or market conditions, actual, prospective or otherwise, but this shall not be construed to prohibit the inclusion of the then market in a report or account of an actual sale of livestock.

## V

“Nor pay to anyone, directly or indirectly, any sum of money, or other thing of value, for his patronage, influence or assistance in obtaining or securing shipments, orders for purchases or other help or assistance in any manner related to or connected with the livestock commission business, but this shall not be construed to prohibit a regular bona fide and salaried employee, or active officer or member of a market agency from soliciting consignments and business in the vicinity of the stock yards, on the road, or in the country, such solicitation other than at or from the stock yards being limited to one salaried solicitor.”

At the present time, it is theoretically possible, but practically impossible for the ranchman to sell his livestock on the Fort Worth market without incurring his share of the usual expenses of selling. Under present arrangements the commission companies to which livestock is consigned guarantee the payment of all the charges incurred in handling and selling it on the market. Should a ranchman attempt to sell his own livestock, he would first have to give some assurance to the Fort Worth Belt Railway that it would get its money for handling the cars. The Stockyards Company would also want to be assured of getting its pay before it went to the expense of unloading, yarding and feeding the livestock. It is thus seen

that it is practically necessary to have some reliable selling agency on the market to represent the stockmen.

*Relative Advantages of Corporate  
and Cooperative Selling Agencies*

In the foregoing, the marketing of livestock has been discussed from the standpoint of selling it through corporate commission companies engaged in the business for profit. The ranchman's interest may or may not be properly served by such concerns. Their commission comes on the basis of numbers of heads or carlots sold rather than that of the prices received.

During recent years many stockmen have come to believe that the corporate selling agency does not always serve their best interest in every respect and that such concerns are inclined upon opportunity to charge excessive fees. The result of this kind of reaction among stockmen has brought on a movement for cooperative selling agencies.

The American Farm Bureau Federation, for example, has on foot a project for establishing cooperative livestock commission agencies in the principal packing centers. The idea is that while these cooperative concerns may not drive the corporate commission companies out of business, they may accomplish several purposes. (1) The competition which the cooperatives will give the corporate agencies will serve as a test of the efficiency and the general desirability of the two kinds of marketing agencies. (2) By assuming the responsibility of operating their own selling agency, the growers place themselves in position to receive any profits realized or to stand any losses sustained by their cooperative agency. (3) The growers will become familiar with markets and marketing machinery in the same manner and to the same extent as corporate agencies. (4) The growers will undoubtedly be better satisfied with their marketing agencies because they will be controlling their products until they reach the packer. (5) Their experience in the market will convince them of the necessity of growing a more marketable product and of standardizing and grading it before offering it for sale.

*Essentials of Cooperation*

Space forbids our going elaborately into a discussion of the pros and cons of cooperative marketing, but some of the essentials are worthy of attention just here.

(1) Men must be inclined to cooperate. This means that they must be willing to work for the interest of their fellows in the industry as well as for their own. They must have confidence not only in their brothers, but also in the principles of cooperation. Farmers and ranchmen have heretofore been too strongly individualistic for their own best interests. A cooperative organization must be composed not of uninformed, selfish and destructively critical men, but of men well informed, constructively critical and who believe they are serving their own interests best when they are serving their neighbor's.

(2) Once a cooperative concern is in operation, its future, other things being equal, is dependent upon the loyalty of the cooperators. They must not be led away from the cooperative by the underbidding of individual or corporate agencies who wage war upon the cooperative because they feel that the life of their business is dependent upon their ability to cripple or kill the cooperative.

(3) Presuming that the cooperative spirit has been developed among the people, the next essential to success is the assurance of a sufficient volume of business to obtain all the economies of an efficient business organization within the particular field in which the cooperative proposes to function. Probably more failures have occurred among cooperative agencies from the mere fact of having too small a volume of business than any other cause. The community may have a sufficient volume of business if all or a greater part of the growers enter into it and support it loyally and continuously.

Continuity of business is being assured by certain cooperative concerns at the present time by making commodity contracts which are legally binding for a period of five years or more. If there is doubt as to the volume of business, it will be well to make a comprehensive survey with a view to ascertaining the facts.

(4) The fourth essential is leadership. Leadership is fundamental to the success of concerted action. This is generally true in all cooperative enterprises and especially true among those of farmers and ranchmen. In most farm or ranch communities, however, there are public spirited men who are well informed and financially able to assume leadership for the benefit of the community and who will do so if they are sufficiently encouraged and convinced that they will receive the moral support of sufficient numbers of men to assure success of the undertaking.

Likewise the success of the central marketing agency is dependent upon the character and ability of the men who compose its organization. The matter of primary importance, therefore, in organizing such an agency is securing the services of a manager and salesmen of ability and integrity. The demand for the services of such men is so great that they usually command comparatively high salaries. The cooperative, therefore, cannot expect to secure the services of a competent manager and salesmen unless the governing body pays as much for talent as corporate marketing agencies.

The mere payment of attractive salaries, however, is no assurance of securing the right kind of men for the several positions. The very fact that the salaries are attractive causes men to seek the positions merely because of their attractiveness, and oftentimes it happens that incompetent men are employed because of influences brought to bear upon the governing body.

While in farming sections local shipping associations are usually necessary in order to assemble products in sufficient quantities for securing the advantages of carlot shipments, in an extensive ranching section such an association is hardly necessary, since practically all the producers have sufficient livestock for shipping in carlots. Such an organization may be desirable, however, in the more intensive ranching areas where the ranches are smaller and individual ranchmen have not sufficient animals of a given type or class to ship in carlots. This being the case, a central marketing agency must be formed in part upon the pledges of local shipping associations in small ranching and stock-farming sections and in part upon those of

individual stockmen who have enough livestock to ship in carlots.

A central agency at Fort Worth should be prepared to handle (1) fat stock for slaughter, (2) stockers and feeders, and (3) registered or unregistered breeding stock. Texas, being primarily a breeding ground and therefore a stocker- and feeder-producing state, the feeder and stocker department will play an important role in the success of the marketing organization.

While at the present time the greater part of the registered animals and breeding stock transactions is handled directly between the breeder and grower through private sales or auctions, a properly organized breeding animal department might serve a very useful purpose in finding buyers for member breeders, encouraging the use of better breeding stock, and in reducing the expenses of marketing it.

#### *National Agency*

Since the price-determining forces are national and even international in scope, cooperation will stand greater chances for continuous success if the central cooperative marketing agencies of the several states are organized upon a national basis. The national agency, for example, should gather national and international marketing statistics and should serve as a bureau of information for growers.

### OTHER LIVESTOCK SELLING AGENCIES

#### *Mail Order Business*

All the while we have been thinking of the more usual methods of marketing ranch livestock, among which the selling agency located at the packing center plays a leading part. Some progressive ranchmen have made a success of selling direct to feeders. These men have developed herds of very high quality through methods of breeding and selection and, by standardizing and grading, they are enabled to market a uniform product. Through advertising and making good their promises, they have become known both for their personal reliability and the quality of their offerings. It is only necessary for such men to furnish the buyers with information as to the number, age

and quality of stockers, feeders or breeders offered for sale. This may be accomplished by descriptions and photographs of the livestock. The purchasers are reached either by advertising in the leading farm journals or by correspondence or a combination of both. Thus a sort of mail order business may be developed for livestock selling.

One of the most outstanding examples of success along these lines is the S. M. S. Ranch owned by Swenson Brothers and managed by Frank S. Hastings, at Stamford, Jones County, Texas.<sup>128</sup> For many years this firm has been breeding beef cattle for uniformity and quality. It publishes an illustrated booklet showing the cattle and the conditions under which the feeder calves and yearlings are grown. During the past 20 or 25 years Mr. Hastings has developed a mail order business with Corn Belt feeders which has proved satisfactory both to the S. M. S. Ranch and to the feeders themselves. In answer to a recent inquiry Mr. Hastings replied:

“ . . . Answering your specific question as to whether we enter into a contract as to quality or any written guarantee, we do not. We simply sell our standard, which is fully described in the booklet. That standard has been so well established that practically every one knows what it is, and during the past season in which we have shipped some six thousand head of calves and yearlings on direct order, every buyer has written us praising the cattle very highly, and in the 20 years we have sent cattle to the cornbelt, we rarely had a complaint of any character . . . .

“We have never had but one man who made any big complaint and later when he had finished the cattle and they had made the highest record, \$21.50, that a car load of cattle ever sold for in open market, we felt fairly vindicated.”<sup>129</sup>

The advantages of the mail order feeder business are: (1) Growers and feeders deal with each other direct. They come to know each other and to sympathize with each other in the growing and finishing of cattle. (2) They save two commissions, one the grower's selling commission and the other

<sup>128</sup> The writers regret to state that Mr. Hastings died on June 12, 1922. In his passing the ranching industry sustains the loss of one of its ablest leaders.

<sup>129</sup> Letter from Frank S. Hastings, Manager for Swenson Brothers, S. M. S. Ranch, Stamford, Texas, to Director B. Youngblood of the Texas Station, dated January 30, 1922.

the feeder's buying commission. (3) They may also save certain unloading, feeding, watering and loading charges. Presuming that these savings are divided equally as between grower and feeder, they find it mutually advantageous to deal direct. Moreover the animals stand the chance of reaching their destination in better condition than when shipped through stockyards to be sold and reshipped to Corn Belt feeders.

Another example of the success of direct selling is that of Mr. S. E. McKnight, of Sutton County. During the past thirty years, he has developed a herd of high quality. He usually photographs his offerings and sends a picture along with his description.

What these men are accomplishing by direct selling may be characterized as a mail order business and may be adopted to advantage by other ranchmen or cooperative growers' associations. Such associations might be even more successful than individual ranchmen because only the larger ranches can develop a business of the character of the S. M. S. and McKnight ranches. Smaller ranches would find it advantageous to com-



Figure 65. Standard calves, from the range through the feed lots to the packing house.

(Photograph at left courtesy Highland Hereford Breeders' Association, Marfa, Texas, and photographs at right and bottom courtesy Swenson Brothers, S. M. S. Ranch, Stamford, Texas).



bine with a view to securing uniformity of breeding and quality, the cutting down of overhead selling expenses and securing the advantages of cooperative selling.

### *Auctions*

Another method of direct selling which has most of the advantages of the mail order business is selling by auction. Sales by this method, like those of the mail order business, are dependent in part upon good will and in part upon previous breeding for uniformity and quality. An interesting example of the auction method is that of the Highland Hereford Breeders' Association with headquarters at Marfa, Texas. This Association breeds for quality and standardizes and grades its calves and yearlings into uniform lots. It has been quite successful in shipping to the Corn Belt and selling at auction.

Regarding membership the by-laws of this Association state: "Any reputable breeder of Hereford cattle may become a member of this Association upon approval of the Board of Directors and payment of the membership fee. Applications for membership shall be made in writing to the Secretary, who will present the application before the Board of Directors for their approval. An incorporated company or firm composed of two or more members can become a member the same as an individual and will be entitled to only one vote, the same as an individual." Members may be expelled for making unfair rendition of their calves or acting ". . . . unfair in any way toward the Association or any purchaser." The membership fee is \$25.00 and the records of the Association are open at all times to members.

The officers consist of a President, a Vice President, a Secretary, a Treasurer, and a Board of Directors consisting of nine members, and in addition three committees are provided for in the by-laws as follows:

"Finance Committee: whose duties shall be to assist in preparing an annual budget for the Association, and audit the books of the Secretary and Treasurer once annually and make a report to be submitted at the regular January meeting.

"Membership Committee: who shall pass upon the eligibility of applicants for membership. They shall place partic-

ular stress upon the quality of the applicant's cattle in deciding upon his eligibility.

"Advertising Committee: whose duties shall be to decide upon the proper mediums to be used in the publicity campaign of the Association and to assist in preparing copy for the same.

"The President shall be an ex-officio member of all committees."

The Association has a trade-mark arranged in a suitable design reading as follows:

"HIGHLAND HEREFORD BREEDERS' ASSOCIATION  
MARFA, TEXAS

Quality and Fair Dealing"

It employs a livestock photographer and publishes a beautifully illustrated booklet presenting the "Feeder Cattle Industry of the Big Bend District of Texas." The illustrations show not only the livestock, but many of the ranchmen, their homes and their ranches.

The Association, though young, has so far met with decided success.

Such movements as have been started by such men as Mr. Hastings, Mr. McKnight and the members of the Highland Hereford Breeders' Association are the chief hope for the future of successful livestock raising and cooperative marketing in the permanent ranching areas of Western Texas.

There is every reason why Sutton County ranchmen should proceed at once to the uniform improvement of their livestock by standardized breeding and selection for type and quality, and perfecting their marketing schemes whether they lead through the stockyards or to direct selling by advertising and mail order or auction. In addition to producing cattle, sheep and goats for the commercial markets, Sutton County and for that matter the entire Edwards Plateau presents opportunities for the development of the production of registered animals to be sold for breeding purposes.

The business principles upon which the purebred herds are developed and successfully maintained are not greatly dissimilar from those of highly successful growers of livestock for market. The principal difference is that the breeder of reg-

istered animals must be more of a specialist with reference to a given type and class than the producer of stockers and feeders. It is to be hoped that in years to come, the stockmen of the United States may be able to find all types of registered breeding animals of the highest quality among the ranches of the Edwards Plateau. That some headway has already been made in this direction is evidenced by the fact that in this region may be found more of the leading American breeders of Angora goats than any other section of the United States. A similar interest is being taken in the breeding of registered Merino, Delaine Merino and Rambouillet sheep, and leading breeds of beef cattle, notably Herefords.

#### *Future Demands for Beeves and Muttons*

According to the Bureau of Animal Industry,<sup>130</sup> there has been a decided decline in the per capita consumption of meats in the United States since 1908. At that time the annual consumption per capita amounted to 170.9 pounds whereas in 1920 it was 142.1 or a decline of 28.8 pounds. The per capita consumption of beef in 1907 was 79.7 pounds while in 1920 it was only 56.4 pounds or a decline of 23.3 pounds. This accounts for the greater part of the total decline in the per capita meat consumption in the United States. Between 1907 and 1920 the per capita consumption of veal increased from 7.1 to 8.5 pounds. There was a very slight decline in the per capita consumption of mutton. In 1907 it was 6.4 whereas in 1920 it was 6.1 pounds. There has been practically no change in the per capita consumption of lard. There has been a slight decline in the consumption of pork. In 1907 the per capita consumption was 74.1 while in 1920 it was 71.0 pounds.

The future of the demand for beeves and muttons will depend very largely upon the demand for beef and mutton. The effective demand for beef and mutton in turn will depend upon two factors: (1) the price of meat and (2) advertising. The amount of beef and mutton consumed will depend upon the price of beef and mutton in relation to substitutes. If the price of

<sup>130</sup> "Meat Production, Consumption, and Foreign Trade, in the United States, 1907-1920", special mimeographed circular compiled by John Roberts of the Editorial Office and issued by the Bureau of Animal Industry, United States Department of Agriculture, Washington, D. C.

beef is so high that substitutes are adopted by consumers, it will become difficult to persuade them to lay aside substitutes and again consume beef and mutton. It becomes imperative, therefore, that if the present decline in the consumption of beef is to be checked and future consumption increased, its cost delivered to the consumer must be kept proportionately as low as substitutes, relative desirability considered.

The possible economies in growing meat, getting it ready for consumption and delivering it to consumers must be secured through the efficiencies practiced by retailers, transportation agencies, packers, selling agencies and the livestock growers themselves. If the grower wishes to encourage the use of meat among consumers, it is his duty to reduce the expenses of production in every manner possible so as to make it not only easier for him to realize a profit, but also for the consumer to buy. He is not only interested in keeping his own cost down to a minimum, but in knowing that transportation, manufacturing and distribution costs are also held to an equitable minimum.

People may be encouraged to eat more meat by suitable advertising. As examples of the effect of advertising upon the consumption of agricultural products, we have those of the raisin growers inducing us to eat more raisins; the prune growers inducing us to eat more prunes; the fig growers inducing us to eat more figs; the citrus growers inducing us to eat more grapefruit, oranges and lemons; the cereal manufacturers inducing us to eat more breakfast food; and the stimulation of the use of hams and breakfast bacons by the different packing companies.

Some effort has been made to increase the consumption of beef and mutton by advertising, but any results which have been obtained have been more than overcome by other influences such as the increased price of beef and mutton together with the recent declines in the purchasing power of the consumer's dollar, along with the decline in the number of dollars which he has to spend. Moreover the advertising of competitive products such as milk and butter, baked beans and the like has also had its influence tending to effect the decline in meat consumption. Then again during the war we had the so-called "meat-

less days" and other propaganda which led the consumers away from beef and mutton to such substitutes as Belgian hares, poultry and poultry products.

In order that justice may be done all the different products and people may become more expert judges as to what they really need to complete their diet, all producers concerned should be compelled to base their advertising upon scientific facts pertaining to the palatability, digestibility, nutritive value and in general the desirability of the foodstuffs offered for sale.

While the advertising of particular products by the different packing companies may somewhat encourage meat consumption, it is largely a competitive advertising and its chief influence is to cause people to buy one brand of hams or bacon, for example, or another. If the best results are to be had in advertising meats of all kinds, they will be attained by the concerted action of all those interested in creating, assembling, preparing and distributing these products. If, for example, it is desired to increase the consumption of beef by judicious advertising, it will be necessary for the advertisers interested in the consumption of beef to convince consumers (1) that beef is an important element in their diet and (2) that its digestibility, palatability, food value and desirability considered, it is a bargain at the price, and that it is within their purchasing power.

## MARKETING WOOL AND MOHAIR

In the improvement of sheep for both mutton and wool, English flock-masters made greater headway than those of Continental Europe, because of the greater amount of peace and protection which prevailed in their insular position in primitive times. They at first raised sheep in order to have mutton and wool for local consumption, but at an early date they began to produce a surplus of wool which was readily disposed of to Continental weavers who had taken the lead in wool manufacture. For a long time English weavers produced only the coarser fabrics and Englishmen bought their finer goods from foreign markets. England, therefore, soon saw that it was to her interest to develop manufacturing, especially the weaving of the finer fabrics.

England's greatness as a manufacturing country was assured when, in the early part of the Fourteenth Century, Edward III encouraged Flemish weavers to settle in different parts of England. In his time it was enacted that foreign weavers should be received into England and encouraged. Simultaneously the export of wool was prohibited. With the growth of wool manufacturing in England came the development of English wool markets.

Gradually the surplus wools of every country tended to drift to London and buyers from the more important manufacturing countries have necessarily gone there to fill their orders. In this manner London has become the world's greatest wool market.

In a manner somewhat similar to that in which London has developed, Boston has become the leading American wool market. The art of weaving was borrowed from England in much the same fashion that it was originally borrowed by England from Flanders.

New England was poorly adapted to agriculture, but was favored with the essentials of successful wool manufacturing. It had a suitable climate, plenty of waterpower, and water transportation connections with the rest of the world. Just as the world's wool supply drifts to London, the American wool supply drifts to Boston. Generally speaking, the price of wool in Boston is based on London quotations. Likewise the prices in the secondary markets in the United States are based on Boston quotations. The price of wool in Texas, for example, local influences ignored, tends to be the price of wool of similar quality and class in Boston, minus the expenses of marketing. These expenses include storage, transportation, grading and selling commissions, insurance and other essential or non-essential costs.

It is the desire of the growers of wool to secure as nearly as possible the Boston prices for their commodity. They understand, of course, that there are certain expenses of marketing which must be met, but they are interested in knowing whether or not the expenses actually incurred are held to a necessary minimum.

The prices actually received for wool depend upon quality and shrinkage. Quality is expressed in well known terms known as grades. The fact that there are a great many different breeds of sheep in the world (about 40 of which are of British

origin), that these are often intermixed, and that there is a correspondingly great variation in the quality of the wool, makes it rather evident that wool grading is necessarily complicated.

It is practically beyond the possibilities of the layman to become an expert wool grader, but since there is no great amount of variation in grades within a given breed, the grower inclined toward observation and study should be able to know something of the quality of the wool which he ordinarily grows.

In accordance with the different kinds of wool grown in the world, there are different market grades. We have one system of grading or classing known as the "International" which involves one set of terms, and we have another known as the "American" or "Boston" grades, involving another set of terms. The two are contrasted in the following tabulation so as to show the Boston equivalents of the International terms:<sup>131</sup>

**"Explanation of Wool Terms  
(Equivalents)**

International Terms	Spinning Counts	Boston Terms
Strong 3/4 Bred (Occasional)	36's to 40's	Braid
3/4 Bred	40's to 44's	Low 1/4 Blood
Halfbred	46's to 50's	1/4 Blood
Comeback	50's to 56's	3/8 Blood
	58's to 60's	1/2 Blood, Staple
		1/2 Blood, Clothing
Merino, Combing	64's to 74's	Fine and Fine Medium Staple
Merino, Clothing		Fine and Fine Medium Clothing
Rams, Merino	64's to 70's	Bucks, Fine
Rams (Longwool)	36's to 44's	Bucks, Braid
Black (Crossbred)		Black
Tags (Stained Pieces)		Tags (Mixed)
Locks		Locks
Bellies (Merino or Crossbred) Graded		(None) Bellies attached to fleeces
	1st Pieces (Merino or crossbred)	
	2nd Pieces (Merino or crossbred)	

**NOTE:** The International equivalent of "BRAID" is the name of the breed of sheep which produced the wool. The same rule applies to all longwooled Rams, the name of the breed branded on the bale of wool, such as Lincoln, Leicester, Romney or Cotswold.

There are exactly the same number of "Grades" in each system of classing and branding. The equivalents, however, should be regarded as approximations, because grading in Boston and Philadelphia sometimes varies a little owing to market fluctuations and changed local conditions. Foreign wool is always classed in accordance with the predominating, or bulk spinning count in each fleece."

<sup>131</sup> Professor W. T. Ritch, Australian Wool Expert, Boston; taken from personal correspondence.

The spinning count has reference to the quality of the wool. The unit is the hank, containing 560 yards of yarn. If, for example, the spinning count of a given lot of wool is 64's, this means that one pound of 64's quality, top, will spin 64 hanks each 560 yards long; 50's will spin 50 hanks, and so forth. The spinning count of market grades of wool varies from about 36's in coarse, to as high as 80's in exceptionally fine wools.

That the grading of Texas wool, however, is not so complicated a process as one might surmise after a hasty perusal of the foregoing list of grades, becomes evident when we realize that the great bulk of Texas wool comes within one or two of the Boston grades. West Texas wool is grown on sheep of Merino, Delaine and Rambouillet blood. It goes to market, therefore, largely as Fine Medium or Fine. Ordinarily, however, both Fine Medium and Fine are thrown into one class. The following statement shows the grades upon which Boston quotations are made on West Texas wool:

Fine.....	12-months
Fine.....	8-months
Fine.....	Fall.

Fine 12-months wool is twelve months' growth sheared in the spring of the year. Fine 8-months wool is wool sheared in the spring of the year from sheep which were sheared the preceding fall. Fine Fall wool is wool which is sheared in the fall from sheep which were sheared the preceding spring. In addition to this, there are a great many refinements in grading into "choice," "average," "inferior," "combing," "clothing," and so forth. "Combing" wool is the long wool of any grade above 2 3-8 inches long according to some mills, and above 2 1-2 inches in Bradford Mills. "Clothing" wool is wool of any grade shorter than "combing" length.

While Boston grades are stated in familiar breeding terms, they have no particular reference to breeding other than that Merino sheep tend to produce fine wools and Cotswold and Lincoln types of sheep tend to produce coarse wools.

Whether or not the Texas grower actually receives the Boston price less the expenses of marketing, depends upon where and how his products are sold. While the breeding and shearing are normally considered in connection with the production of



wool on the ranches, they have so important a bearing upon marketing results that it is well to consider them in this connection as a part of the marketing process. The grade of wool which the grower sells depends primarily upon his ability to select and breed his sheep for both quantity and quality of fleeces.

Assuming that the growers can produce wool of satisfactory quality it is to their interest to shear it properly and keep it clean and free from all foreign matter such as jute strings, trash and dirt, and to classify the fleeces in accordance with good marketing practices.

### *Shearing*

In early days the wool and mohair were clipped by hand, but now modern shearing machines are in common use. While a few ranchmen own stationary outfits and do their own shearing, the greater number employ traveling shearing outfits operated by Mexican shearers. An outfit consists of a shearing machine with several "drops" or shears mounted on the running gear of a wagon and driven by a gasoline engine, a boss, and sufficient hands to do the work. Because of a lack of proper facilities, however, but few ranchmen in Sutton County are prepared to shear and put up their wool and mohair in first-class condition. Best results are obtained when expert shearers do the work with modern shearing machinery.

The fleece should be clipped uniformly close to the skin without injuring the animal, left intact and "tagged." The expert shearer knows how to catch and throw the animals without injury. The sheep and goats should be sheared on shearing boards and not on the ground; otherwise the wool and mohair will be dirty and trashy. Oftentimes considerable amounts of dirt, manure and "tags" are tied up in the fleeces. This, of course, affects prices. The more progressive ranchmen have well-arranged shearing sheds in which both the sheep and goats and the wool and mohair are handled with the greatest facility. There are but few shearing sheds in the county, however, in which the animals may be handled to the best advantage and the fleeces put up in first-class condition.

The result is that much wool and mohair goes to market in very poor condition and, owing to rather crude methods of

grading and selling, those who grow fleeces of high quality and put them up in the proper manner are penalized. Their excellent products merely help sell those of the men who are indifferent as to their methods of breeding, shearing and packing their clips.

The spirit of cooperation, however, in the matter of breeding, shearing and handling wool and mohair with a view to securing better prices, is gaining ground in Sutton County and in fact throughout the State. There is, for example, a more or less informal agreement among men in the eastern part of the county to keep a certain type of sheep, to use care in clipping and putting up their wool, to pool it and to select a man to sell the pool. This organization is operating on a small scale as yet, but it has demonstrated the fact that the best assurance of satisfactory prices is a standard product of superior quality. These men have already developed considerable good will for their product.

Among the obstacles, therefore, in the way of better prices for Texas wool and mohair are their lack of uniformity and quality and the careless manner of shearing and putting up the fleeces. These faults can only be corrected by the ranchmen themselves.

Wool growing in Texas differs from that in other sections, because of the custom of shearing twice a year, due in part possibly to climatic conditions and in part to habit. Out of the 76 ranchmen answering the question "How many times a year do you shear sheep and goats?", 35 stated that they shear once a year and 41 stated twice a year. Sixty-two operators who answered the same question regarding the shearing of goats, all stated that they shear twice a year.

Table 96 shows when the ranch operators of Sutton County shear their sheep.

Table 97 shows when the ranchmen of Sutton County shear their goats.

TABLE 96  
Showing answers to question "When do you shear sheep?", as given by ranch operators

Groups of Ranches By Sizes	Number of Ranches Studied	Number of Answers Given	Answers to Question "When do you shear sheep?"												
			Spring Season						Fall Season						
			February	March	April	May	June	September	October	November					
Total .....	97	103 <sup>132</sup>	3	9	14	39	2	17	18	1	0	0	0	0	0
Under 1 section .....	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 and under 2 sections .....	10	11	3	1	1	1	0	4	1	0	0	0	0	0	0
2 and under 4 sections .....	5	4	0	0	2	1	0	1	0	0	0	0	0	0	0
4 and under 8 sections .....	25	25	0	3	5	8	0	4	5	0	0	0	0	0	0
8 and under 12 sections .....	19	18	0	1	1	8	1	2	4	1	0	0	0	0	0
12 and under 20 sections .....	18	18	0	1	1	10	1	1	4	0	0	0	0	0	0
20 and under 32 sections .....	9	10	0	0	2	6	0	2	0	0	0	0	0	0	0
32 sections and above .....	10	17	0	3	2	5	0	3	4	0	0	0	0	0	0

<sup>132</sup> Reported by 68 operators.

TABLE 97  
Showing answers to question "When do you shear goats?", as given by ranch operators

Groups of Ranches By Sizes	Number of Ranches Studied	Number of Answers Given	Answers to Question "When do you shear goats?"															
			Spring Season						Fall Season									
			February	March	April	May	June	August	September	October	November							
Total . . . . .	97	111 <sup>133</sup>	4	26	18	7	1	12	33	9	1	0	0	0	0	0	0	0
Under 1 section. . . . .	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 and under 2 sections. . . . .	10	13	1	2	3	1	0	1	5	0	0	0	0	0	0	0	0	0
2 and under 4 sections. . . . .	5	6	0	2	1	0	0	0	3	0	0	0	0	0	0	0	0	0
4 and under 8 sections. . . . .	25	28	0	10	4	0	0	1	10	3	0	0	0	0	0	0	0	0
8 and under 12 sections. . . . .	19	18	3	3	3	0	0	9	0	0	0	0	0	0	0	0	0	0
12 and under 20 sections . . . . .	18	18	0	4	2	3	0	0	6	3	0	0	3	3	0	0	0	0
20 and under 32 sections. . . . .	9	12	0	3	2	0	0	1	4	0	0	0	2	2	0	0	0	0
32 sections and above. . . . .	10	16	0	2	3	3	0	1	5	1	1	1	1	1	1	1	1	1

133 Reported by 56 operators.

## Quantity of Wool and Mohair Marketed

There are about 2,000,000 pounds of wool and 625,000 pounds of mohair grown in Sutton County each year. Most of this is marketed through the different warehouse commission companies in and adjacent to the territory. There is no storage or regularly organized commission company in the county, but some of the local merchants are agents for certain outside firms. Some ranchmen sell through more than one commission house.

Table 98 shows where the ranchmen of Sutton County sell their wool and mohair.

TABLE 98

Showing where Sutton County ranch operators market their wool and mohair

Groups of Ranches By Sizes	Number of Ranches Studied	Where do You Market Wool and Mohair?					
		Number Reporting	San Angelo	Del Rio	Menard	Kerrville	Other Places
Total.....	97	91	33	34	15	12	16
Under 1 section .....	1	0	0	0	0	0	0
1 and under 2 sections ..	10	8 <sup>134</sup>	2	2	2	2	5
2 and under 4 sections...	5	5	1	1	1	1	0
4 and under 8 sections...	25	23 <sup>135</sup>	7	6	4	4	3
8 and under 12 sections..	19	18	8	7	1	2	1
12 and under 20 sections.	18	18 <sup>136</sup>	6	11	2	1	3
20 and under 32 sections.	9	9 <sup>137</sup>	4	4	2	0	3
32 sections and above...	10	10 <sup>138</sup>	5	3	3	2	1

<sup>134</sup> Three operators market at two places and one markets at three places.

<sup>135</sup> One operator markets at two places.

<sup>136</sup> Two operators market at two places and one markets at four places.

<sup>137</sup> One operator markets at two places and one markets at four places.

<sup>138</sup> One operator markets at two places and one markets at four places.

There are at least fifteen different commission companies getting a part of the Sutton County clip. They are private concerns organized for the profit of the stockholders.

The commission charged by the companies is ordinarily 2½ per cent. The wool is all sold on inspection, that is, a buyer from some Eastern or Northern firm comes to the storage houses, looks it over and buys on his own estimates of grade. The true grade of the grower's wool is not reported in the account-of-sales received by him. He is simply notified that on a certain day the company sold for him a certain number of bags of six- or eight-months wool at a certain price. The charges connected with the sale are deducted and the ranchman is sent a check covering the amount due him.

The wool is concentrated, but it is not in a pool. The clip of each ranchman is presumably sold separately. The economies due to bulk sales are, therefore, not received unless it be indirectly. In order for the ranchmen to secure the greatest advantages of sales on a large scale, they should have their wool graded and the grades bulked and then pooled. When a lot of such wool is sold, each patron would share in the proceeds in proportion to the amount of wool he has in the pool. If his wool were given a low grade, he could, with propriety, ask why. Thus knowing the cause for his low grade, he could take steps to remove it. At the present time there is very little incentive to do so because growers as a rule do not know what they produce, and they are not sure that if they took pains to grow better wool and mohair and put it up in better shape they would be rewarded for their efforts.

Sixty-eight out of 88 ranchmen reporting neither know the grade of wool that they are producing nor on what basis the commission company is selling it. More than half of the ranchmen know practically nothing of the method of determining the price of their wool. At least one wool house out of the four visited makes an attempt to classify the wools taken in for sale. The grades are designated as No. 1, No.2, and No. 3. The wool is put into one of these classes either on the basis of the kind of sheep run or of the region from whence it came. The buyer who comes to bargain for it, however, does not necessarily buy on the basis of this classification. Such a method of sale is objectionable in that the grower may never learn just what grade and quality of wool or mohair he actually grew and delivered to the warehouse.

Many ranchmen claim that they prefer to make their sales on the ranch. In that case they do their own bargaining and have an opportunity to discuss the defects of their wool, but even then they cannot and do not expect the buyer to give his candid estimate of the grade. His firm expects him to play safe in making purchases and it is reasonable to believe that he does.

Present methods of storing wool and mohair are historically in a transitory stage from still more primitive methods practiced in years gone by, but, nevertheless, they are still far from satisfactory. Texas wool, like all other wool, is accurately graded in Boston or other wool markets before it is finally sold to the manufacturer. There is no adequate reason, therefore, why it should not be thus graded before it passes out of the ownership of the growers and the grades become a matter of public information.

It seems that the storing and selling agencies, corporate or cooperative, should employ expert graders and pool on the basis of grades, in order to secure all the advantages of large-scale sales. The patrons or members should be reliably advised as to the grades of wool and mohair which they are growing and how to improve these grades. Such service as this is of greater importance to the growers than that of a low commission.

#### *Wool and Mohair Grading and Scouring Plant*

The Texas Agricultural Experiment Station has adopted a very practical means of assisting the growers of wool and mohair in the improvement of their fleeces. It has in operation a grading and scouring plant equipped with the very latest and best of improved machinery and has employed an experienced man for the work. Texas sheepmen and Angora goatmen may take samples of their fleeces in accordance with instructions furnished by the specialist. These samples are received at the plant, graded, sorted and scoured, and in due time a report is sent to the grower, showing the grades, shrinkage, spinning count and yield of scoured wool. In addition, instructions are given as to the improvement of fleeces by better matings and by the adoption of better methods of shearing and handling the wool.

This information, together with the samples of the graded and scoured wool and mohair, should enable the growers not only to breed better quality, but also to know more about the market

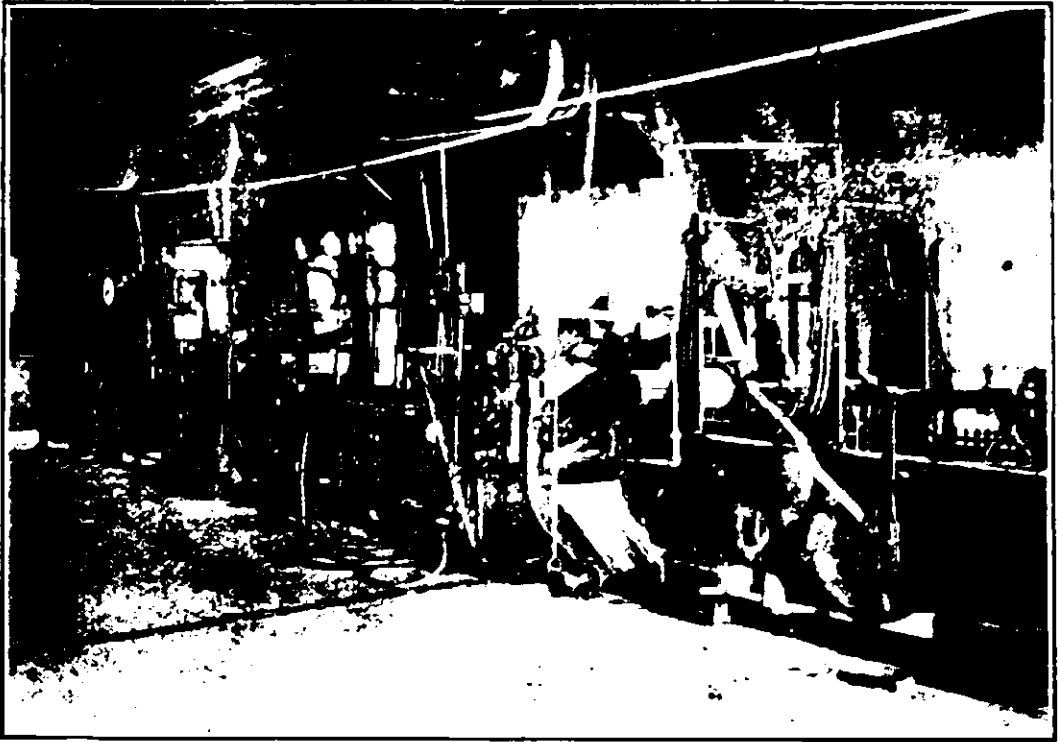


Figure 66. Sectional view of wool grading and scouring plant of the Texas Agricultural Experiment Station showing scouring machinery.

grades and thus become better bargainers in the sale of their wool and mohair.

Ranchmen should not only become more familiar with the quality and shrinkage of their wool and mohair and with the shortcomings of their flocks, but they should insist on their wool and mohair being bought on the basis of the grades upon which they change hands in Boston. The results obtained by the grading and scouring plant may be at first disputed by some whose interests are not served by it. It will be to the interest of the sheepmen and goatmen, therefore, to be very careful that they take truly fair and representative samples in accordance with the instructions and if they have any doubt about their ability to do this, they should send for the grading and scouring specialist to come and take the samples himself.

If all due precautions are observed both in taking the samples and in grading and scouring them, the growers will be definitely benefited in three respects. (1) They can go about perfecting their breeding so as to produce wool and mohair of the highest yield and quality. (2) They will greatly strengthen their



bargaining power so that if those who have been accustomed to buying their wool and mohair in bulk with no mention of grades should refuse to revise their methods of buying, others may be found who will appreciate the progressiveness of the growers and buy on the proper basis of market grades and shrinkages. (3) Correct grading will provide the only equitable basis for pooling, without which growers are unable to secure for themselves all the advantages of large-scale marketing operations.

### WOOL AND MOHAIR MARKETING CREDIT

Since buyers for wool are not available at all times, wool storage companies have made arrangements to advance a portion of the anticipated price of the wool at the time of delivery. In order to make the advance, the wool must be turned over to the company subject to its judgment as to the best time to sell, and when the company decides to do so it may sell without notice.

The notes given by the ranchmen not only bind the wool delivered, but the mortgage is usually drawn to bind the sheep and all future clips until the debt is paid. It is further stipulated that all future clips must be delivered to the commission company for sale and if the ranchman does not comply, he has agreed to pay the regular charges to the company the same as if he had delivered his wool.

The credit is granted, therefore, both as a means of securing business and for profit. While such advances have undoubtedly been of great service to sheepmen and goatmen and appreciated by them, it is not to their ultimate best interests to have their credit and marketing agencies so interwoven that their marketing practices may be interfered with by their credit obligations.

If these short-time loans were used exclusively for meeting the short-time marketing credit needs of the growers, they would not necessarily be objectionable from the standpoint of good marketing policy, but the fact remains that such credits are more often than otherwise used to meet not merely short-time, but also the intermediate-time credit needs of the borrowers. Thus, once they establish a line of credit with their marketing agency, they are likely to be tied up continuously and are, therefore, obligated to deliver their wool and mohair to this agency, even though they might improve their circumstances by changing.



**PART III**  
**SOCIAL STUDIES**



## CHAPTER XV

# THE RANCH COMMUNITY

## DEFINITIONS

### *"Community" Defined and Described*

The word "community" has been variously used by different people to designate groups and areas of different sizes. Sometimes it is used synonymously with the term "neighborhood." According to the most common uses, however, it refers to the people living within a rather definite geographic area under the same laws and customs and who have certain fundamental economic, social and political interests in common. If the people of the community are progressive, they will in due time develop and organize the economic and social forces in such manner that each individual as well as the group will receive the greatest advantages.

A ranch community may be defined, therefore, as a group of ranch people who are interdependent in the development of their economic and social institutions and activities. The owners and operators of the ranches constitute the principal element in the community and around them the community life is built. The merchants, lawyers, doctors, teachers, preachers, bankers, mechanics, and others are members of the community, but they belong to it primarily because they render certain economic and social services to the ranchmen. They ordinarily reside in the community towns, because it has been found by experience that they can render more efficient service to ranchmen by living in town than scattered throughout the ranch community.

The economic functions of a ranch community are the production of ranch products, their sale in the markets and the purchase of supplies. The social functions of a ranch community are to provide certain institutions and activities which best serve the social interests of the people.

The factors involved in the efficient production and marketing of livestock in a ranching community are (1) the development of a suitable ranch layout; (2) the selection of livestock to be run; (3) the prevention of losses of livestock from disease; (4)

the development of carrying capacity; (5) the establishment of satisfactory credit relations and of marketing facilities, and (6) the management of the ranch by a capable head.

The responsibility for the effective application of these factors rests in part upon the individual ranchman and in part upon the community. The individual, for example, is primarily responsible for the control of animal diseases within the borders of his ranch, but his neighbors are responsible for the control of these diseases on the ranches about him in order that they may not spread to his livestock. In a similar manner the individual has certain responsibilities with reference to his neighbors. From the standpoint of self-interest it is clearly to the advantage of the individual to cooperate with them for in return he receives the cooperation of all of them combined.

It is often desirable to have specialists come into a community and aid in the solution of particular problems. The individual may not feel like paying the expense of such service, but when the community undertakes to bring in a specialist, the expense to any one individual is nominal. A given individual, for example, may not be able to employ all the artists necessary for a lyceum course for the benefit and entertainment of his family, but, if he were able to do so, it would likely be well worth the expense. By cooperating with his neighbors, however, it is possible to secure all of the advantages of a lyceum course at a nominal expense. Thus at every turn in life the individual enjoys many satisfactions which would be entirely beyond his means if he had to provide them for himself without the cooperation of his neighbors.

The marketing of ranch products has certain community aspects which are vital to prosperity. It is generally recognized that great economies in marketing may result from growing first-class products, advertising them well, handling them in large amounts and using only essential middlemen. Up to the present time ranchmen have done very little to secure these economies. There has been considerable pooling of wool, but this has been done largely by private individuals and corporations primarily for their own benefit. In recent years ranchmen have formed some real cooperative pools, but as yet pooling is still in its infancy. When it is completely worked out there

will probably be community pools which will be combined into district or central pools for the purpose of improving wool marketing.

The ranchmen are also becoming more interested in the development of an efficient system of livestock marketing. Perhaps a majority of the ranchmen visited are favorable to testing out some form of cooperative livestock selling agency. They believe that if such an organization were formed, the amount of savings in commissions would be incidental to other advantages secured.

Ranching is of such a nature, however, that it is more difficult to organize a ranching community for cooperation in the production and marketing of ranch products than it is to form similar organizations for the production and marketing of farm products. In Sutton County, for example, there is much specialization among ranchmen, varying with the size of ranches. The operators of the large ranches buy calves and lambs from the smaller ranches and graze them a season or more. Accordingly the big operators sell most of the livestock which leaves the county. So long as this is the practice the demand for a suitable marketing organization lies not with the local community, but with the big operators who sell on the central markets. As the number of small ranches increases and their operators become more interested in securing for themselves all the economies of marketing, the demand for community marketing organizations of various kinds will be greatly increased in a ranching area like Sutton County.

The need of group action for the promotion of desirable social institutions and activities is more obvious to most ranchmen than that of cooperation for economic purposes. They appreciate the need of community action in the improvement of their schools, churches and public roads. They also are willing to cooperate in securing a railroad through their county. Sentiment is very strong in favor of making the entire health problem a community affair. About seventy-five per cent. of the ranchmen questioned, for example, said that a community nurse was needed and that they were favorable to the establishment of a community hospital the expenses of which would be borne in part by the community and in part by the individuals using them.

A community park would meet with public favor and support. It might be imagined that ranchmen live so far apart that they would make but little use of a park. Ranch people as a rule, however, are fonder of outdoor recreation than those in farming sections. The greater distances traveled in ranching sections mean no more to ranch people than the shorter distances traveled in farming sections. This attitude on the part of ranch people goes far in overcoming what is popularly known as their isolation and makes possible the organization of community affairs over a much larger area than would be practical in farming sections.

### *The Neighborhood*

Within the community there may be one or more smaller groups, commonly referred to as neighborhoods. The people of a neighborhood do many things cooperatively. If one goes to town he often gets mail and makes purchases for others. Neighbors lend and borrow freely and often exchange work. The neighborhood is often named for a prominent citizen of the locality, a church, a school or some peculiar physical condition or bit of history. Two outstanding examples in the Sonora community are Mayer and Mittel neighborhoods.

## SIZE OF THE SONORA COMMUNITY

The Sonora community is about the size of Sutton County, although its borders do not correspond exactly with those of the county. It extends over the county line in places on the north, south and west sides. On the east, northeast, southeast and at places on the west side it does not extend up to the county line. Most of the people in the eastern part of the county go to Menard for railroad service and to Junction or Menard for school and church activities and for the purchase of much of their household supplies. The Sonora community loses some parts of the county on the west to Ozona, but in other places gains practically as much from Crockett County as it loses. The area of the Sonora community comprises about one million acres of land.



There are many factors tending to change the real from the legal community. Some of these are topography, quality of the road, direction of telephone lines, source of mail service and the size and quality of the marketing center itself. The absence of a railroad in Sonora prevents it from performing all the service to the community which it should perform. A great deal of ranch equipment, salt and other goods is bought by Sutton County ranchmen at railroad points. They must go to San Angelo, Menard or Del Rio to deliver their wool or mohair or to ship their livestock and in returning they haul back as much goods as their trucks or wagons will carry. In this manner they save considerable in freighting charges.



Figure 67. Sonora, the center of the ranching community studied.

Table 99 shows the number of ranchmen in Sutton County who patronize the different railroad points.

TABLE 99

Showing towns where railroad service is obtained by Sutton County ranchmen.

Groups of Ranches By Sizes	Number of Ranches Studied	Where is Railroad Service Obtained?				
		Total Number Reporting	Menard	San Angelo	Del Rio	Barnhart
Total .....	97	92	28	70	5	2
Under 1 section .....	1	1	0	1	0	0
1 and under 2 sections .....	10	9	5	4	0	0
2 and under 4 sections .....	5	5	1	4	0	0
4 and under 8 sections .....	25	24 <sup>139</sup>	9	17	1	0
8 and under 12 sections .....	19	18 <sup>140</sup>	3	16	1	0
12 and under 20 sections .....	18	18 <sup>141</sup>	4	15	1	1
20 and under 32 sections .....	9	8 <sup>142</sup>	4	6	2	0
32 sections and above .....	10	9 <sup>143</sup>	2	7	0	1

139 Three operators report railroad service at two places.  
 140 Two operators report railroad service at two places.  
 141 Three operators report railroad service at two places.  
 142 Four operators report railroad service at two places.  
 143 One operator reports railroad service at two places.

The distance from trading centers, especially railroad points, and the development of rural mail routes and the parcel post have been factors influencing many ranchmen to buy a considerable portion of their supplies by mail. The catalogues of the big mail order houses are made very attractive and offer the people a greater variety of goods and convenience in delivery in many cases than those of the customary trading point. If the merchants in ranching towns ever secure the business of the ranch people it will be necessary for them to meet all the advantages which are offered by mail order firms. They must be able to furnish the people what they want at similar prices and deliver it with the same dispatch. Out of 83 ranchmen who answered the question "Do you buy from a mail order house?", 52 said they did and 31 said they did not.

Table 100 shows the number of Sutton County ranch operators who order by mail, grouped according to the size of ranches.

**TABLE 100**

Showing number of Sutton County ranch operators who order by mail.

Groups of Ranches By Sizes	Number of Ranches Studied	Number reporting	Do You Order by Mail?	
			Yes	No
Total .....	97	83	52	31
Under 1 section .....	1	1	1	0
1 and under 2 sections .....	10	8	6	2
2 and under 4 sections .....	5	4	4	0
4 and under 8 sections .....	25	22	14	8
8 and under 12 sections .....	19	17	12	5
12 and under 20 sections .....	18	15	9	6
20 and under 32 sections .....	9	9	2	7
32 sections and above .....	10	7	4	3

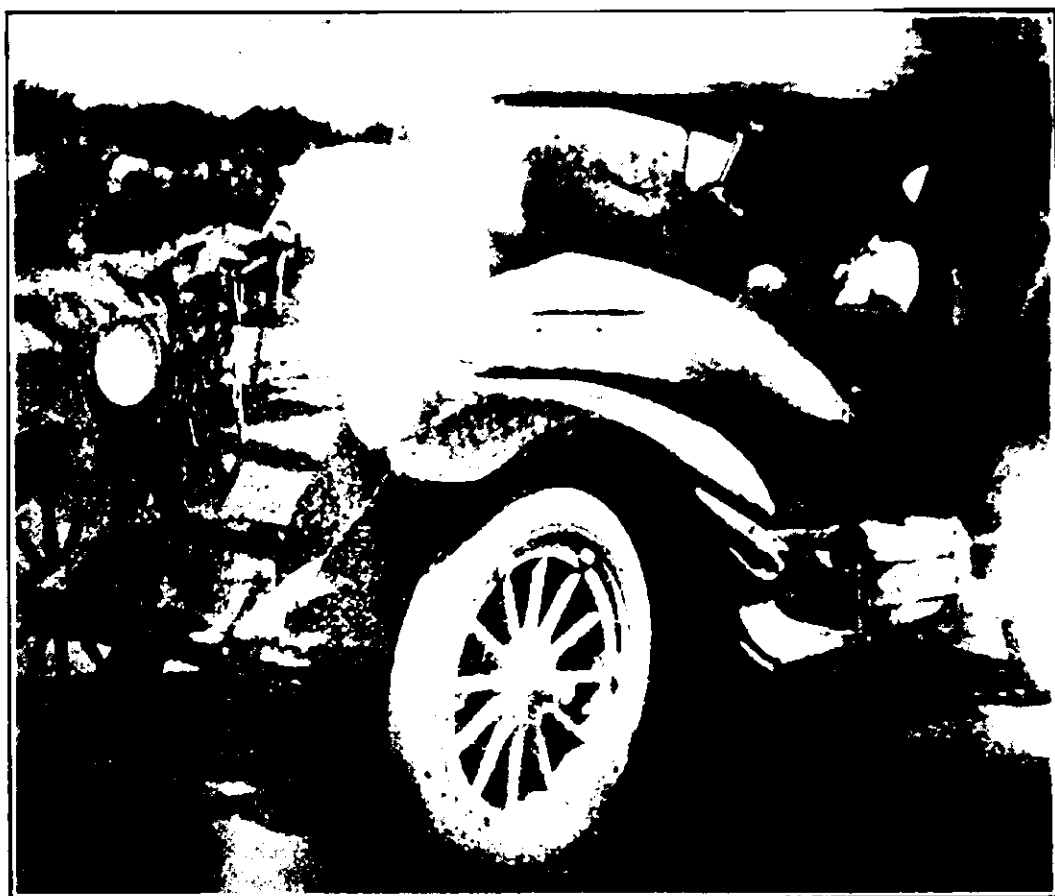


Figure 68. The cars which carry the mails from railroad points to interior towns are usually heavily loaded.

*Where the Ranch People Live*

Many ranch families live in town. Most of the ranch owners and operators live in the trading center either all or a part of the time. Those who have children of school age as a rule find it more satisfactory to move into Sonora during the school term or else live at Sonora all the time than to attempt to send their children in to school from the ranches. A majority of the ranchmen who claim Sonora as their community center own houses there. Ordinarily their town houses are much better equipped than those of their ranches. The men spend the greater part of their time on the ranches even though their families live in town continuously. The usual custom is for the men to come to town on Saturday and return to the ranch on Monday. If the ranch is not over 15 or 20 miles out they may come to town more frequently. The town properties come to be considered largely the possessions of the wives and there is considerable rivalry among them in beautifying the premises.

Most of the one-section ranchmen live on their ranches because their incomes are too small to maintain a house in town. The inability of the smaller groups of ranch operators to provide adequately for the education of their children should serve as a warning to those who blindly advocate the cutting of ranches into very small units. Unless ranch products should vastly rise in price without a corresponding increase in the expense of production, it is practically impossible for ranchmen operating less than four sections to maintain and support homes in the community center.

Table 101 shows where the ranch owners and operators live.

TABLE 101

Showing number of Sutton County operators who live on ranch all time, number who live in town all time and number who live in town during the school term.

Groups of Ranches By Sizes	Number of Ranches Studied	Total Number Reporting	On Ranch All Time	In Town All Time	In Town During the School Term
Total .....	97	75	37	34	4
Under 1 section .....	1	1	1	0	0
1 and under 2 sections .....	10	9	8	1	0
2 and under 4 sections .....	5	1	1	0	0
4 and under 8 sections .....	25	19	9	7	3
8 and under 12 sections .....	19	16	6	9	1
12 and under 20 sections .....	18	14	4	10	0
20 and under 32 sections .....	9	7	4	3	0
32 sections and above .....	10	8	4	4	0

### FINANCING A RANCH COMMUNITY

The comparative cheapness of land and the extensive nature of ranching make the problem of financing a ranch community a difficult one unless a large area is included. In the matter of developing suitable schools, the ranchmen appreciate these difficulties and accordingly most of them favor a county-wide school district. In most cases it is practically impossible to place an elementary school within the usual traveling distance of the pupils. If it is necessary to move to the community center for school purposes, they might as well form a district large enough to adequately finance a first-class school. There are only two small isolated rural school districts in Sutton County at the present time, Cedar Hill and Mayer. While it is more convenient politically at the present time to make the school districts con-

form to county lines, it would be more logical to make them conform to natural community boundaries.

Even when the school district is county-wide, the tax rate and the rendition value of property are often high in order to provide the necessary funds. Of local funds created by taxation, the schools receive the greater part. The public roads are often neglected, but at the present time there is a sentiment favorable to laning and improving the principal highways.

It is impossible for a ranch community to perform all of its proper functions so long as its community center has no railroad. Ranchmen in the Sonora community buy much of their supplies at railroad points. If Sonora had a railroad, her trade territory would not only be enlarged, but she would retain much of the trade of the ranchmen who now purchase only a part of their supplies from her merchants.

### THE RETIRED RANCHMAN

The problem of the retired ranchman is not so serious as that of the retired farmer. A ranchman's retiring is more a matter of quitting work than moving to town and relinquishing management. At first, instead of going out on Monday and remaining at work on the ranch until Saturday, he goes out in good weather or in rush seasons. Later on he goes out to the ranch less frequently and thus gradually retires. When the farmer retires, he rents his place out on shares and loses a large part of its control when he moves into town.

After retiring from the more active work of running the ranch, the ranchman may choose to do any one or more of several things with the ranch. (1) He may retain the business management and direct the work of the ranch through a reliable foreman. (2) He may form a partnership with a young stockman who may or may not be related to him, and retain the business management. (3) If the partner has sufficient experience and is capable, the retiring ranchman may turn the active management of the ranch over to him. (4) He may lease the ranch to another stockman. (5) He may sell out and lend his money to other ranchmen or otherwise invest it in the community. (6) He may sell out, move to a distant city and invest his money in such a way that it never again finds its way back to the industry.

A ranchman's retiring, therefore, may change his relation to the community economic and social affairs but very little. If he has previously been accustomed to taking an active part in such affairs, he is likely to continue to do so and may even take a more active part after relinquishing a part or all of his duties on the ranch.

There is not, therefore, so much evidence of a sudden change in the life of a ranchman when he retires as is usually the case with a retired farmer. Likewise the ranch does not necessarily suffer so much from the retirement of the ranchman as the farm does when the farmer retires.

If, however, the retiring ranchman moves out of the ranch community to a distant city, the effect upon both him and the community is comparable to that of the farmer's retiring and moving to town.



## CHAPTER XVI

### RANCH LIFE

#### THE PEOPLE

Social life in a ranch country is the resultant of the interaction of many different forces, chief among which may be mentioned the racial qualities of the people and their environment. Most of the people of Sutton County, including the ranch owners, the tenants and the more important laborers, are of Southern stock. Their manner of living, however, is more typically Western than Southern. A considerable amount of the seasonal and part of the regular labor is performed by Mexicans. There are but few negroes on the ranches.

The inherent qualities of men are accentuated or suppressed by occupation and environment. The outdoor life and the usually invigorating climate have tended to give ranch people strong and vigorous bodies. As a rule they are active, alert, energetic and self-reliant. They are capable of enduring much physical exertion and hardship. From the highest to the lowest, ranch people not only work, but they seem to get considerable pleasure out of the skillful performance of their daily tasks.

The conditions which characterize a permanent ranching area compel a sparsity of population. People unaccustomed to ranch life often imagine that the isolation must be very monotonous, yet ranch people complain of it but very little. They possess a happy faculty for adjusting themselves to their environment and overcoming its obstacles. Ranch people, therefore, are happy not in proportion to their isolation, but to the extent that they make good use of it or minimize it by means of improvements in communication and transportation.

As a rule isolation varies directly with the sparsity of population, but in a ranching section circumstances may overcome this tendency. When the ranch is too small to maintain the family in accordance with a comfortable standard of living, the advantages of increased numbers in a ranching community are offset by the inability of the ranchman to provide the necessary means of transportation and communication for overcoming the dullness and monotony of isolation, which are inseparably asso-



Figure 69. A typical ranchman.

ciated with the physical conditions under which ranching is carried on.

It would be difficult to conceive of more perfect isolation, for example, than that which exists on a ranch whereon the income is too small to permit the owner to provide himself with a telephone and a Ford. Such a ranch also fails to permit the ranchman to send his family or his children to town during the school months in order to provide them with the advantages of schooling.

On the other hand, the monotony of isolation is largely overcome on the family size ranches. Here the ranchman has sufficient income to provide an automobile and a telephone, to send his children to town to attend school and to travel quite a bit during the year attending fairs, going to market and otherwise looking after his business and professional interests.

The ranchman whose income is sufficient to enable him and his family to maintain the necessary contacts with the business and social world, finds a certain satisfaction in the solitude of ranch and range. It is his opportunity for meditation and the formulation of ideals and ambitions. Such men will doubtless agree with John Stuart Mill<sup>144</sup> in saying:

<sup>144</sup> John Stuart Mill, "Principles of Political Economy," Second Edition, John W. Parker, West Strand, London, England, 1849; page 313 of Volume II.

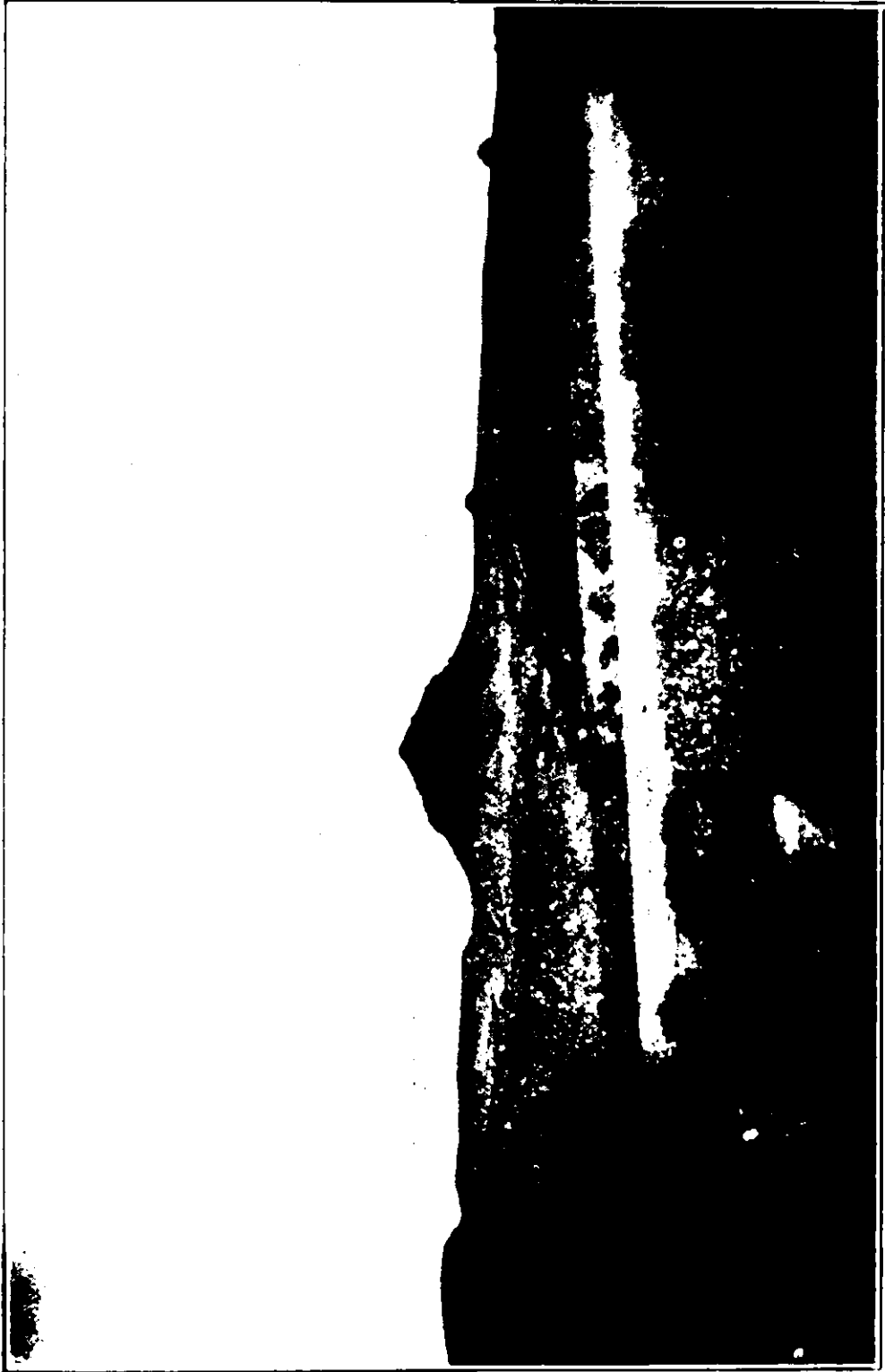


Figure 70 "The solitudes of nature have their compensations."

“. . . A population may be too crowded, though all be amply supplied with food and raiment. It is not good for man to be kept perforce at all times in the presence of his species. A world from which solitude is extirpated, is a very poor ideal. Solitude, in the sense of being often alone, is essential to any depth of meditation or of character; and solitude in the presence of natural beauty and grandeur, is the cradle of thoughts and aspirations which are not only good for the individual, but which society could ill do without. Nor is there much satisfaction in contemplating the world with nothing left to the spontaneous activity of nature; with every rood of land brought into cultivation which is capable of growing food for human beings; every flowery waste or natural pasture ploughed up, all quadrupeds or birds which are not domesticated for man's use exterminated as his rivals for food, every hedgerow or superfluous tree rooted out, and scarcely a place left where a wild shrub or flower could grow without being eradicated as a weed in the name of improved agriculture. If the earth must lose the great portion of its pleasantness which it owes to things that the unlimited increase of wealth and population would extirpate from it, for the mere purpose of enabling it to support a larger, but not a better or a happier population, I sincerely hope, for the sake of posterity, that they will be content to be stationary, long before the necessity compels them to it.”

## SOCIAL INSTITUTIONS

### *The Ranch Home*

*Location:* While farm houses ordinarily are placed on or near the roadside, ranch houses are more frequently found some distance back from the public highway, toward the center of the ranch. The roads in a ranching section are of two kinds, (1) laned roads and (2) unlaned or pasture roads. The greater part of the roads of Sutton County, however, at the present time<sup>145</sup> are pasture roads. The movement for laning the county highways has only recently begun.

The location of the ranch house on the roadside is impractical unless the highway happens to run through the ranch. As a

<sup>145</sup> August of 1920.

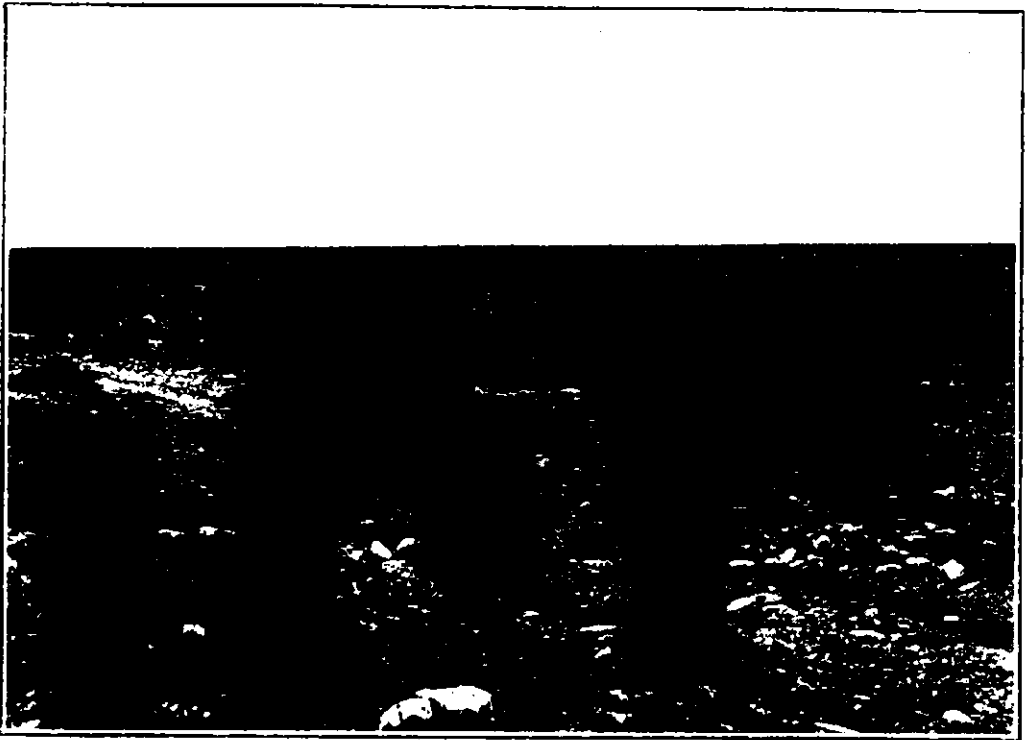


Figure 71. A typical pasture road.

rule, however, ranchmen prefer that their headquarters be located away from the much-traveled public highways. The headquarters is or should be laid out with reference to convenience in the handling of livestock. The house is ordinarily surrounded by a network of corrals, "traps" and pastures. It is very undesirable, therefore, both from the standpoint of the ranchman and the traveling public for public roads to extend through the headquarters. The occupants of headquarters houses located off the road, of course, do not frequently come in contact with the traveling public.

*Functions:* The headquarters house is the nucleus around which both the business and the social life of the ranch are developed. The elaborateness of the ranch house varies considerably with the size and state of development of the ranch. It may vary all the way from a bunkhouse whose porches serve as saddle-room, sleeping porch and lounging place and whose kitchen serves as a storeroom, to a comfortable ranch dwelling with many rooms and provided with all modern conveniences. It often provides board and lodging for the ranch hands, serves as an

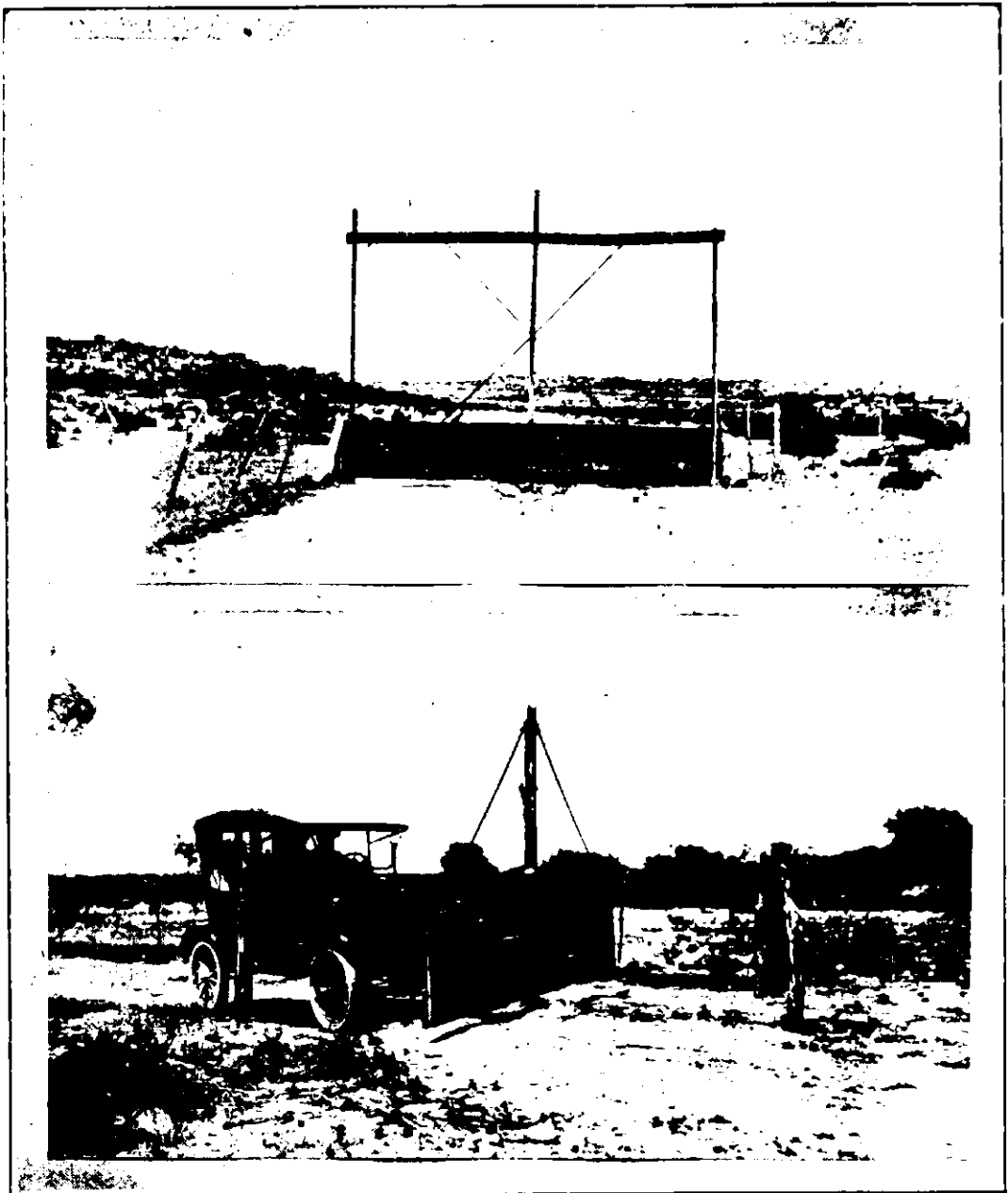


Figure 72. A practical type of gate, found on a road in the ranch country. Automobiles open it by running into it.

office for the keeping of ranch records and accounts and the transaction of ranch business, and the center from which plans and directions for the operation of the ranch are formulated and sent out.

It is also a social center. It is the place where ranch people get together for the discussion of the affairs of the ranch or of

public questions. It is a place where guests are received and entertained and where one's neighbors come together occasionally for social intercourse and entertainment.

*Size of Headquarters Houses:* The number of rooms in the ranch headquarters house was obtained for 58 different ranches. Two have two rooms each, eight have three rooms each, 15 have four rooms each, 15 have five rooms each, 10 have six rooms each, seven have seven rooms each, and one has eight rooms. The size of the ranch has very little influence on the type of buildings after the four-section group of ranches is reached. The houses on the one-section ranches are as a rule in an especially poor state of repair.

*Home Equipment:* The equipment for the ranch house is best on the medium sized ranches. Out of the 92 ranchmen who answered, 66 have running water and 13 have both hot and cold water. In the group of ranches containing from 8 to 12 sections, 17 out of 18 reporting have running water. The group showing the least proportion of running water is the one containing one section; of the nine reporting, not one has running water. No ranch under four sections has hot running water.

Reports from 87 ranchmen show that 36 ranch homes have bath tubs and 51 have none. There are no bath tubs on the one-section ranches reporting. The largest percentage is in the group containing from 12 to 20 sections. Seventeen reports were obtained for this group, showing that 11 of the ranches have bath tubs.

Five ranch homes have inside toilets. These are on ranches having more than four and less than 32 sections of land. Ten ranchmen have lighting systems. They are all in the groups of ranches containing eight or more sections.

Most ranches have musical instruments. Reports were received from 75 ranches as to the number and kind of musical instruments they possess, including both those on the ranches and those in their houses in town. Fourteen out of the 75 have none and the remaining 61 ranchmen possess a total of 91 instruments. Forty-seven ranchmen have musical instruments on their

ranches. There is on the ranches a total of 59 instruments consisting of 32 phonographs, 22 pianos and five other instruments. Twenty-eight ranchmen reported 33 musical instruments in their town homes. Twenty of these instruments are pianos, 10 are phonographs and three are some other kind.

The ranchmen whose ranches contain four and under 32 sections possess the bulk of the musical instruments. Less than one-third of the ranchmen in the one-section group have instruments, and each of the ranches in the group containing 20 and under 32 sections has one or more.

The telephone and automobile go a long way toward relieving the isolation of ranch life. The automobile brings many social events within the reach of the ranch which otherwise it would be impossible for them to attend. There are necessarily few important social events within a radius that will permit a family to go and return the same day in a horse-drawn vehicle. The telephone makes communication possible at all times. It enables all members of the family to keep up with the news both locally and abroad. There are 68 telephones on the 89 ranches reporting. The one-section ranches have the fewest telephones. Reports were obtained from nine one-section ranchmen and only three have telephones. All ranchmen who have 20 sections or above have telephones.

There are more automobiles on ranches in Sutton County than there are ranches. The 93 ranchmen reporting have a total of 106 automobiles. Four of the ranchmen do not own cars. The greatest percentage of those who do not own cars is in the group of ranchmen who own one section of land. The ranchmen operating 32 sections or above have the greatest number of cars. The 10 men in this group have a total of 19 cars.

### *Schools*

There are 14 students from the 97 ranches studied in Sutton County now<sup>146</sup> in a college or university. The Agricultural and Mechanical College of Texas and the University of Texas receive most of the patronage. There are no students in college from families living on ranches having less than four sections of land, though there are 16 families and 66 children living on such



ranches. The greatest number of college students comes from the group of ranchmen having eight to twelve sections. One out of every four ranchmen in this group has a child in college.

There are four public schools in Sutton County. They are Sonora, Cedar Hill, Pecan Grove and Rocky Ridge. Cedar Hill is on the Llano and draws some patronage from Kimble County. It has about 25 pupils. Pecan Grove and Rocky Ridge are neighborhood schools. The former had not opened in December and it was doubtful whether it would. Rocky Ridge was in session and had a total of nine pupils. Sonora has 332 pupils and is ambitious to develop a first-class high school.

The chief difficulty of all the schools is a lack of money. They have so few pupils that the amount they draw from the State is inadequate for their needs. The land is the chief source of tax income, and ranch lands carry a low valuation. Many of the ranchmen are of the opinion that the solution of the school question is a large district around community centers, such as Sonora, Ozona and Junction. In their opinion the school district should contain practically the entire area of a county. It is impossible to make a district small enough for all children to even ride and attend, and large enough to assure sufficient number of pupils, and finance it properly. Since it is necessary either to board the pupils near a school or move there for the school term, it is better to go far enough and take in enough territory to make the school worth while.

The great trouble with the community high school is the fact that there may be a few ranchmen who are unable to incur the expense necessary for boarding their children in town, or in moving to town.

These large districts should not necessarily be confined to county lines. They should rather conform to the boundaries of the social and economic activities of the people. In Sutton County, however, the county-wide school district would likely do the people on the county line an injustice in most instances. On the eastern border, for example, it would put some people in the Sonora district whose social life and trade activities are centered at Junction. On the south border, it would cut off some who prefer Sonora. The logical thing to do would be to make a school district which would correspond as nearly as possible to the trade territory of Sonora.

*Sonora School Building and Equipment:* The Sonora school for whites is housed in a ten-room two-story rock building with a basement. It is poorly arranged and equipped for the best school work. The lighting and air space are up to standard insofar as amount is concerned, but the arrangements for securing the supply of air and light are inadequate. The building is heated with jacketed stoves. The water supply is obtained through drinking fountains located on the outside of the building. The two toilets are also on the outside and are not modern.

The school has a fair supply of dictionaries and about 300 books on various phases of literature. The library is cared for by certain pupils during their vacant periods for which they are paid regular compensation. The school board appropriates \$100.00 per annum to buy books, periodicals, and so forth, for the library. The school is fairly well supplied with maps, charts, blackboards and other equipment.

The school grounds are ample for all recreation activities. They have all the equipment necessary for the games of the older pupils, but very little is provided for the smaller ones. The personal equipment required by each pupil for athletic activities, such as suits, tennis balls, and so forth, is furnished by the pupils using it. This is no handicap, however, for most every pupil is able and willing to furnish his own equipment.

*Teachers and Their Salaries:* The instructional force consists of 11 teachers for the white school and two for the Mexicans. Two of the teachers, the superintendent and the principal, are men. Three of the teachers have college or university degrees. Most of the other teachers are from normal schools. All teachers in the white school have permanent certificates except two who hold first-grade certificates.

All the teachers have come from outside of the community except one. About half of them are teaching their first term in Sutton County. The longest continuous service of any teacher is four years.

The salaries of teachers vary from \$900.00 for grade teachers to \$2,000.00 per annum for the superintendent. There is no established scale of advances applicable to those who make a success and wish to stay. They are assured, however, that there will be advances based on length and quality of service. The school has a nine months session.

There are 70 Mexican children of school age in the county. Most of these live in Sonora. There are from 50 to 60 pupils enrolled each year. There are two white teachers for the Mexicans. They have a one-room school-house divided into two rooms by a canvas partition. They are supposed to teach through the sixth grade, but so far there has been no call for instruction above the fifth. The Mexican boys are very anxious to begin earning money as soon as possible.

The majority of the ranchmen are strong advocates of good schools. They prefer to employ the other fellow to develop them, however, rather than spend their own time thinking about such things. Ranchmen were asked for suggestions as to how to improve the school system. Of the 80 who answered, 58 had no suggestions, 12 said they needed more money to hire better teachers, and seven wished to enlarge the district and get more money. The three others suggested different things; one said better roads, another advocated uniforms to prevent class distinction, and the other said church influences in the employment of teachers should be eliminated.

### *Churches*

Securing church accommodations presents similar difficulties to those encountered in developing the schools. There is not one rural church in the county. Preaching is sometimes held, however, at the rural school-houses.

There are three church buildings in Sonora. They are owned by the Methodists, the Baptists, and the Episcopalians. The Methodists have the largest membership, 282; the Baptists, 75; and the Episcopalians, 30 members. The Church of Christ has 12 members. They meet once a week in Sonora, but have no building of their own.

Answers were obtained from 81 ranchmen as to their church affiliations. Thirty-seven are members and 44 are non-members. Of 79 women reporting 52 are members of some church and 27 have no church affiliations. Answers were obtained relative to the membership of the children of 62 families. Thirty-six reported one or more children members of some church and 26 reported no church affiliation for the children. The small ranches show fewer church members than the larger

ones. The family sized ranches show the highest percentage of church membership. In the one-section group there is an average of one member out of every three men. In the eight-to-twelve-section group, 10 out of 14 men are members. The big ranches, 32 sections and above, show one member out of every two men.

Of the Mexicans in Sutton County, almost 100 per cent. of those who claim any religious connections are Catholics. A Catholic priest makes a trip through the country occasionally, but no regular services are held.

The Methodists and Baptists hold from three to four services each week. They have resident pastors and have preaching twice each Sunday, a midweek prayer meeting and sometimes choir practice. The Episcopalians have preaching once a month.

*Church Attendance:* Church attendance is comparatively low. The Methodists report an average attendance at their best attended services of 100; the Baptists 45 and the Episcopalians 25. The attendance is made up largely of townspeople.

The total seating capacity of all churches in Sutton County is estimated at 600. The buildings are rectangular one-room frame buildings heated with wood stoves and lighted by electricity. They have no special equipment for entertainment and none for personal comfort and convenience. The library facilities of all churches combined amount to about 100 books.

*Sunday School:* The ministers estimated a total enrollment of 150 students in Sunday School and an average attendance of about 90. Over 95 per cent. of those enrolled live in Sonora.

The attendance at both preaching and Sunday School is better in winter than in summer. After school is out, most of the people go out on the ranches for the summer. They come back in town only when occasion demands. The few people who have business in town are left to do the church-going. Their protracted meetings have better attendance when held in the winter.

The Sunday School officials and teachers are all townspeople. As a rule they belong to the professional classes. The church officers are likewise town residents, about equally divided between business and professional people.

In addition to their services, the church people have special programs and entertainments for the young people. These consist of special day services like Mother's Day, Children's Day, Education days and Christmas programs. It is customary also to have one or two picnics, church socials and suppers each year.

The church functions are attended by less than one-half of the ranchmen. Out of 65 ranchmen, 19 attended one or more church functions per year and 46 attended none. Out of 62 women, 30 attended such functions and 32 attended none.

*Church Finance:* The churches are financed by local contributions. The annual budget for all churches is about

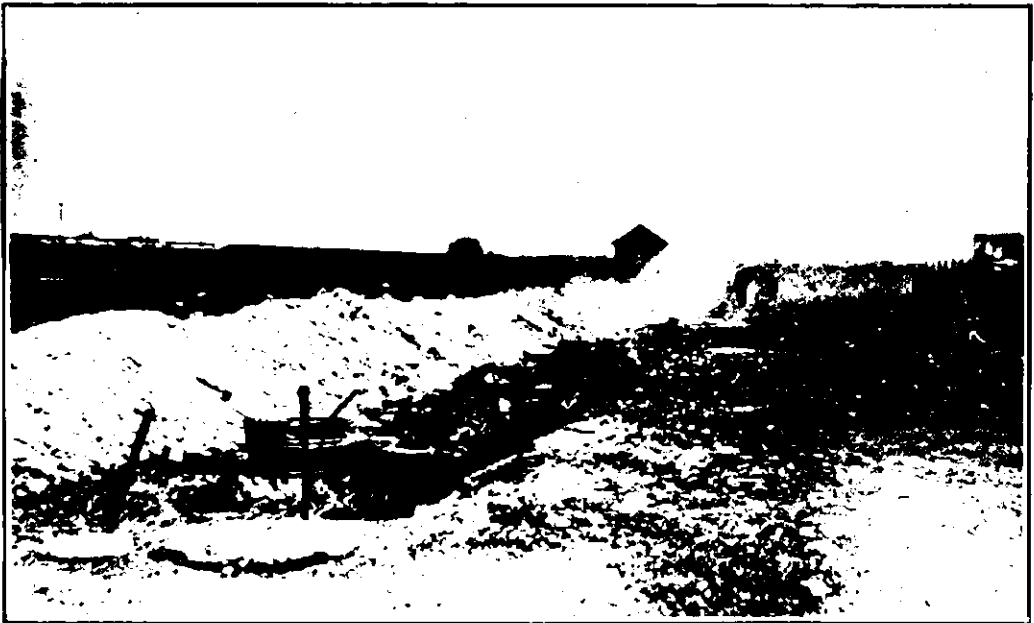


Figure 73. The barbecue occupies an important place in the social life of a ranch community.

\$9,500.00. Of this the Methodists and Baptists raise more than \$9,000.00. About half of this money goes to pay the salaries of the preachers. The remainder is used for various purposes such as missionary work, special membership campaigns and incidental expenses. The money is raised in various ways. The bulk of it comes through pledges and basket collections. Some of it, however, is raised through auxiliary organizations like the Ladies' Aid, B. Y. P. U., Epworth League, and Sunday School.

The two resident pastors are both college men. These men have cars and visit their members regularly. They try to visit those living on ranches at least once or twice a year.

*Lodge Activities*

Fifty-two out of the 92 ranchmen reporting, belong to one or more lodges. The most popular order is the Masons with 37 members. The second in importance is the W. O. W. Besides these, the Elks, Odd Fellows, Maccabees and Eastern Star are represented in the county. The size of ranches has very little to do with lodge membership.

Lodge membership centers in Sonora. Thirty-five hold lodge membership at Sonora, four at Cedar Hill and 13 outside of Sutton County. Forty-one of the members stated that they attend the social activities of their respective orders.

During the course of a year there are a number of barbecues, reunions, picnics and other similar gatherings held in or close to Sutton County. Twenty-two ranchmen said they attend most all of these, 27 said they attend occasionally, five said they attend two or three a year and 36 said they rarely if ever attend such events. The incidental social events like lectures, parties and dances are attended by the ranchmen in about the same proportion as the regular social events.

## STABILITY OF THE RANCH POPULATION

In spite of the drouths, isolation and other handicaps supposed to be the lot of the ranchman, the fact remains that relatively few of the sons of ranchmen go into any other occupation or desire any other occupation. Of the 38 children of ranchmen who have left home, 20 are boys and 18 are girls. There are 18 of the boys ranching for themselves or working on ranches as hired hands, and two are engaged in other occupations. Seven of the 18 girls are wives of ranchmen, five are wives of men in other occupations and six are engaged in gainful occupations, mostly in Sonora.

There are 50 ranchmen who have children at home who are now selecting an occupation. There are 45 of these who say their children prefer ranching and five who report that their children wish to enter other fields. Almost 100 per cent. of the boys who stated their preference for something other than ranching prefer some form of engineering.

There are several reasons why boys reared in a ranch country should long to be ranchmen. - Ranching has every element in it which is calculated to appeal to a boy in the heroic stage of his mental and physical development. The boy longs to don the garb of a cowboy and learn to ride, to rope and to shoot. The riding and roping contests hold out every incentive of daring and heroism that a boy could wish for. In addition to what might be called the show-ring stuff, there are necessarily many exciting features in the handling of livestock in considerable numbers. The modern form of the roundup, going to market and experiences at the central market all have their tales of interest to ranch people. Moreover there is a sentiment gathered about the business in literature and tradition that makes the boy cherish the ambition of some day being able to excel in the varied activities which characterize ranching and ranch life.

## BIBLIOGRAPHY

- "The Agricultural Crisis and Its Causes"; Joint Report of the Commission of Agricultural Inquiry (in four parts), Part I, Report No. 408, 67th Congress, 1st Session; House of Representatives; Government Printing Office, Washington, D. C., (submitted in House October 15, 1921); 1921.
- Alexander, John T., drove cattle from Texas to Logansport, Indiana, about 1848; article in Chicago *Inter-Ocean*, issue August 25, 1876.
- Allen, Lewis F., "American Cattle; Their History, Breeding and Management"; Orange Judd & Company, New York, 1868.
- "American Husbandry", by An American; 1775.
- Armour's Handbook of Agriculture, issued by Armour's Bureau of Agricultural Research and Economics, Union Stock Yards, Chicago.
- Armsby, H. P., "Nutrition of Farm Animals"; The Macmillan Company, New York City, 1917.
- Atkinson, James, "Government Market Reports on Live Stock and Meats"; Separate No. 778, from Yearbook of the United States Department of Agriculture for 1918; Government Printing Office, Washington D. C., 1919.
- Babcock, S. M., and Carlyle, W. L., "The Addition of Salt to the Ration of Dairy Cows"; in 22d Annual Report, Wisconsin Agricultural Experiment Station, Madison, Wisconsin, 1905.
- Baker, O. E., et al, "Atlas of American Agriculture" (in series); Office of Farm Management, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1918.
- Baker, O. E. and Strong, H. M., "Arable Land in the United States"; Separate from Yearbook United States Department of Agriculture, 1918, No. 771; Government Printing Office, Washington, D. C., 1918.
- Baker, Ray Stannard, "The Great Southwest: The Tragedy of the Range"; The Century Magazine, Volume 64, August, 1902.
- Bancroft's "History of the Northern Mexico States and Texas."
- Barker, Robert M., "The Economics of Cattle Ranching in the Great Southwest"; in The American Monthly Review of Reviews, Volume 24, September, 1901.
- Bartrane, William, "Travels Through North and South Carolina, Georgia, East and West Florida"; 1791.
- Barnes, Will C., "Stock-Watering Places on Western Grazing Lands"; Farmers' Bulletin 592, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1914.
- Barnes, Will C., "Western Grazing Grounds and Forest Ranges"; Sanders Publishing Co., 542 South Dearborn Street, Chicago, Illinois, 1913.
- Barnes, Will C., and Jardine, J. T., "Meat Situation in the U. S.," Special Report 110, Part II, Live Stock Production in the Eleven Far Western Range States"; United States Department of Agriculture; Government Printing Office, Washington, D. C., 1916.



- Bedell, G. H., "Judging Sheep"; Farmers' Bulletin 1199, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1921.
- Bedell, G. H., and Baker, E. W., "Castrating and Docking Lambs"; Farmers' Bulletin 1134, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1920.
- Bennett, D. H., "Internal Parasites Affecting Sheep and Goats"; Circular 28, Texas Agricultural Experiment Station, College Station, Texas, April, 1921.
- Bentley, H. L., "Cattle Ranges of the Southwest"; Farmers' Bulletin 72, United States Department of Agriculture, Government Printing Office, Washington, D. C., 1898.
- Bentley, H. L., "Grasses and Forage Plants of Central Texas"; Bulletin 27, Division of Agrostology, United States Department of Agriculture, Government Printing Office, Washington, D. C., 1898.
- Bizzell, W. B., "Farm Tenantry in the United States"; Bulletin 278, Texas Agricultural Experiment Station, College Station, Texas, 1921.
- Bizzell, W. B., in "Proceedings of the Second Annual Meeting of the Banker-Farmer Conference, at College Station, March 3-4, 1921", *Factors in Financial Credit*; published by A. and M. College of Texas; Third Series, Volume 7, Bulletin No. 2, 1921.
- Boss, Andrew, "Farm Management"; Lyons & Carnahan, Chicago and New York, 1914.
- Brisbin, General James S., "The Beef Bonanza; or How to Get Rich on the Plains"; J. B. Lippincott Company, Philadelphia, Pennsylvania, 1881.
- Brackett, L. P., "Our Western Empire"; William Garretson & Co., 1881.
- Buckman, George Rex, "Ranches and Rancheros of The Far Southwest"; in Lippincott's Magazine, Volume 29, May, 1882.
- "Carded Woolen Manufacturers' Association", The Duty of the Sixty-first Congress and Its Opportunity; Document No. 270, 61st Congress, 2d Session; Senate; Government Printing Office, Washington, D. C., 1910.
- Carman, Ezra A., Heath, H. A., and Minto, John; "Sheep Industry of the United States; Special Report on the History and Present Condition of the"; Special Report of the Bureau of Animal Industry, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1892.
- Camp, William R., "Proposed Reforms in the System of Food Distribution"; Reprint from The Journal of Political Economy, Volume XXIX, No. 10, December, 1921.
- Carroll, B. R., "Historical Collections of South Carolina"; 1710.
- Cato and Varro, "Roman Farm Management"; translated by A Virginia Farmer; The Macmillan Company, New York City, 1913.
- "The Cattle Industry of Texas and Adjacent Territory; Historical and Biographical"; Woodward & Tiernan Printing Company, Saint Louis, Missouri, 1875.

- "The Cattleman of the Atlantic"; in *Chambers Journal*, Volume 64, June, 1887.
- Carver, Thomas Nixon, "Principles of Political Economy"; Ginn & Company, Boston, Massachusetts, 1911.
- Carver, Thomas Nixon, "Selected Readings in Rural Economics"; Ginn & Company, Boston, New York, Chicago, 1916.
- Census Reports, United States, 1850-1920.
- Chapline, W. R., "Production of Goats on Far Western Ranges"; Bulletin 749, United States Department of Agriculture, Government Printing Office, Washington, D. C., 1919.
- Climatological Data, Weather Bureau, United States Department of Agriculture. Government Printing Office, Washington, D. C., 1911-1920.
- Coffey, W. C., "Catechism on Pooling Wool in Illinois"; published by Illinois Agricultural Association, Livestock Marketing Department, Peoples Life Building, Chicago, Illinois, April, 1920.
- Coffey, W. C., "Growing and Marketing Wool"; Circular 161, Illinois Agricultural Experiment Station, Urbana, Illinois, 1912.
- Cole, Charles, "Cattle Loans and Their Value to Investors"; Separate No. 764, from Yearbook of the United States Department of Agriculture for 1918; Government Printing Office, Washington, D. C., 1919.
- Coman, Katherine, "Economic Beginnings of the Far West"; two volumes; The Macmillan Company, New York City, 1921.
- Connaway, J. W., "Stomach Worms in Sheep"; Circular 87, Missouri Extension Service, University of Missouri, Columbia, Missouri, August, 1920.
- Cotton, J. S., "A Report on the Range Conditions of Central Washington"; Bulletin 60, Washington Agricultural Experiment Station, Pullman, Washington, 1904.
- Cox, A. B., "Economic History of Texas During the Period of the Reconstruction"; a thesis; University of Texas, (filed in library), Austin, Texas, 1914.
- "Credit"; Report of the Joint Commission of Agricultural Inquiry (in four parts), Part II; Report No. 408, 67th Congress, 1st Session; House of Representatives; Government Printing Office, Washington, D. C., (submitted in House October 14, 1921), 1922.
- Darlington, H. T., "A Study of Grazing Conditions on the Weneha National Forest"; Bulletin 122, Washington Agricultural Experiment Station, Pullman, Washington, 1915.
- Davy, Joseph Burt, "Stock Ranges of Northwestern California"; Bulletin 12, Bureau of Plant Industry, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1902.
- DeBow's Review, "Texas Land, Soil and Products"; 12 Volumes, 1867.
- DeLoach, R. J. H., "Progressive Sheep Raising"; Third Edition; issued by Armour's Bureau of Agricultural Research and Economics, Union Stock Yards, Chicago, Illinois, 1919.

- "A Description of the Province of South Carolina"; Drawn up at Charlestown in September, 1731; translated from the French by Jean Pierre.
- Douglass, L. H., "Deferred and Rotation Grazing"; in the National Wool Grower for October, 1915.
- Draper, W. R., "The Passing of the Texas Cowboy and the Big Ranches"; in Overland Monthly, Second Series, Volume 45, 1905.
- Dryden, W. A., and Ritch, W. T., "The Sheep Industry in Canada, Great Britain and United States"; Report of Commissioners; (Special Report), published by the Department of Agriculture of the Dominion of Canada, Branch of the Live Stock Commission, Ottawa, Ontario, November, 1, 1911.
- Edmond, David B., "The History of Texas"; 1836.
- Ely, Dr. Richard T., "Outlines of Economics"; Third Edition, The Macmillan Company, New York City, 1916.
- Ely, Dr. Richard T., "Land Economics"; (in manuscript); Referred to in lectures to classes at University of Wisconsin, Madison, Wisconsin, 1920.
- "Endowment of Agricultural Experiment Stations"; Hearings before the Committee on Agriculture of the House of Representatives, 67th Congress, 2nd Session, January 26 and February 23, 24, and 25, 1922; Serial P; Government Printing Office, Washington, D. C., 1922.
- Farley, F. W., "Growth of the Beef Cattle Industry in the South"; Separate No. 746, from Yearbook of the United States Department of Agriculture for 1917; Government Printing Office, 1918.
- Fleming, C. A., "One Night Camps vs. Established Bed Grounds on Nevada Sheep Ranges"; Bulletin 94, Nevada Experiment Station, Reno, Nevada, 1918.
- "Forage Conditions on the Northern Border of the Great Basin"; Bulletin 15, Bureau of Plant Industry, United States Department of Agriculture, Government Printing Office, Washington, D. C., 1902.
- Forsling, C. L., "Chopped Soapweed as Emergency Feed for Cattle on Southwestern Ranges"; Bulletin 745, United States Department of Agriculture, Government Printing Office, Washington, D. C., 1919.
- Foster, Luther, and Humble, C. W., "Range Cow Maintenance on Yucca and Sotol"; Bulletin 114, New Mexico Agricultural Experiment Station, State College, New Mexico, 1918.
- Frap, G. S., "The Principles of Agricultural Chemistry"; The Chemical Publishing Company, Easton, Pennsylvania, 1919. (Second Edition 1917).
- "General Regulations Governing Licensees Operating Stock Yards, or Handling or Dealing in Live Stock in or in Connection with Stock Yards"; Circular No. 116, Office of the Secretary, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1918.
- Goldenweiser, E. A., and Ball J. S., "Pasture Land on Farms in the United States"; Bulletin 626, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1918.

- "G. T. T. (Gone to Texas); Letters From Our Boys"; The Macmillan Company, New York City, 1898.
- "Government Control Over Prices; History of Prices During the War"; War Industries Board Price Bulletin No. 3; Government Printing Office, Washington, D. C., 1920.
- "Government Control of the Wool Clip of 1918"; Service and Regulatory Announcement No. 50, Bureau of Markets, United States Department, of Agriculture; Government Printing Office, 1919.
- "Grasses; Notes on National Forest Range Plants"; Part I, Office of Grazing Studies, Forest Service, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1914.
- Gray, L. C., and Turner, Howard A., "The Farm Lease Contract"; Farmers' Bulletin 1164, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1920.
- "Grazing on the Public Lands"; Extract from the report of the Public Land Commission; Bulletin 62, Forest Service, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1905.
- Gregg, Alexander, "History of the Old Cherows"; Richardson & Company, 14 Bond Street, New York City. 1867.
- Griffiths, David, "Feeding Prickly Pear to Stock in Texas"; Bulletin 91, Bureau of Animal Industry, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1906.
- Griffiths, David, "Forage Conditions and Problems in Eastern Washington, Eastern Oregon, Northwestern California, and Northeastern Nevada"; Bulletin 38, Bureau of Plant Industry, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1903.
- Griffiths, David, "A Protected Stock Range in Arizona"; Bulletin 177, Bureau of Plant Industry, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1910.
- Griffiths, David, "Range Investigations in Arizona"; Bulletin 67, Bureau of Plant Industry, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1904.
- Griffiths, David, "Range Improvements in Arizona"; Bulletin 4, Bureau of Plant Industry, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1901.
- Griffiths, David, "The Reseeding of Depleted Range and Native Pastures"; Bulletin 117, Bureau of Plant Industry, United States Department of Agriculture, Government Printing Office, Washington, D. C., 1907.
- Hall, Louis D., "Federal Supervision of Live Stock Markets"; Separate No. 809, from Yearbook of United States Department of Agriculture for 1919; Government Printing Office, Washington, D. C., 1920.
- Harrell, David, "Selling Purebred Stock to South America"; Separate No. 818, from Yearbook of United States Department of Agriculture, 1919; Government Printing Office, Washington, D. C., 1920.
- Hastings, Frank S., "The Story of the S. M. S. Ranch"; Handbook issued by Swenson Brothers, owners, S. M. S. Ranch, Stamford, Texas, (Frank S. Hastings, Manager), 1918.

- Henry, W. A., and Morrison, F. B., "Feeds and Feeding"; revised edition, Henry Morrison Company, Madison, Wisconsin, 1915.
- "Herefords for the Nation's Beef Supply"; a booklet pertaining to the feeder cattle industry of the Big Bend District of Texas, issued by The Highland Hereford Breeders' Association, Marfa, Texas, 1919.
- "The 640-Acre Homestead"; Congressional Record for June 2, 1917, Page 3448; Government Printing Office, Washington, D. C., 1917.
- Imes, Marion, "Cattle Lice and How to Eradicate Them"; Farmers' Bulletin 909, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1918.
- Imes, Marion, "Cattle Scab and Methods of Control and Eradication"; Farmers' Bulletin 1017, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1918.
- Imes, Marion, "The Spinose Ear Tick and Methods of Treating Infested Animals"; Farmers' Bulletin 980, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1918.
- "The Importance of the Range Industry"; Second Annual Report of the Bureau of Animal Industry, United States Department of Agriculture, for 1885; Government Printing Office, Washington, D. C., 1886.
- "International Price Comparisons; History of Prices During the War"; War Industries Board Price Bulletin No. 2; Government Printing Office, Washington, D. C., 1919.
- Jardine, J. T., "Coyote-Proof Inclosures in Connection With Range Lambing Grounds"; Bulletin 97, Forest Service, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1911.
- Jardine, J. T., "Improvement and Management of Native Pastures of the West"; Separate No. 678, from Yearbook of the United States Department of Agriculture for 1915; Government Printing Office, Washington, D. C., 1916.
- Jardine, J. T., "The Pasturage System for Handling Range Sheep"; Circular 178, Forest Service, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1910.
- Jardine, J. T., "Range Improvement and Improved Methods of Handling Stock in National Forests"; Proceedings of the Society of American Foresters, Volume VII, 1912.
- Jardine, J. T., "Range Management on the National Forests"; Bulletin 790, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1919.
- Jardine, J. T., and Forsling, C. L., "Range and Cattle Management During Drought"; Bulletin 1031, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1922.
- Jardine, J. T., and Hurt, L. C., "Increased Cattle Production on the Southwestern Ranges"; Bulletin 588, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1917.
- Jones, J. M., and Conner, A. B., "The Utilization of Yucca for the Maintenance of Cattle"; Bulletin 240, Texas Agricultural Experiment Station, College Station, Texas, 1918.

- Jouzier, Emil, "Economie Rurale"; J. B. Bailliere & Fils, Paris, France, 1920.
- Kennedy, P. B., and Doten, S. B., "A Preliminary Report on the Summer Ranges of Western Nevada Sheep"; Bulletin 51, Nevada Agricultural Experiment Station, Reno, Nevada, 1901.
- Kocher, A. E., and Party, "Reconnaissance Soil Survey of South-Central Texas"; Bureau of Soils, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1915.
- Laut, Agnes, "Western Pioneering."
- Linney, Charles E., and Garcia, Fabian, "Climate in Relation to Crop Adaptation in New Mexico"; New Mexico Station Bulletin 113, Agricultural Experiment Station, State College, New Mexico, 1918.
- "Live Stock Marketing Plan of the Farmers' Live Stock Committee of Fifteen"; as adopted by the Live Stock Ratification Congress, November 10-11, 1921; (published by) The National Live Stock Producers' Association, 608 South Dearborn Street, Chicago, Illinois, as Bulletin 2, April 10, 1922.
- Logan, John H., "History of South Carolina"; 1859.
- Mackie, W. W. "The Value of Oak Leaves for Forage"; Bulletin 150, California Agricultural Experiment Station, Berkeley, California, 1903.
- Marshall, Alfred, "Principles of Economics"; The Macmillan Company London, 1916.
- Marshall, F. R., and Potts, C. G., "Raising Sheep on Temporary Pastures"; Farmers' Bulletin 1181, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1921.
- MacMaster's Histories.
- McCuistion, Ed H., (Mayor of Paris, Texas,) "The Municipal Abattoir"; Bulletin 51, State Department of Agriculture, Austin, Texas, September-October, 1916.
- "Meat and Live Stock Digest"; published monthly by Institute of American Meat Packers, 509 South Wabash Avenue, Chicago, Illinois, May, 1922.
- "The Meat Packing Industry of the United States"; Report of the Federal Trade Commission on Food Investigation; Government Printing Office, Washington, D. C., in five parts, 1919-1920.
- Mill, John Stuart, "The Principles of Political Economy"; Second edition; John W. Parker, West Strand, London, England, 1849.
- Morphis, J. M. "History of Texas"; 1874.
- Neally, G. C., and Tracy, S. M., "Grasses of the Arid Districts"; Bulletin 6, Division of Botany, United States Department of Agriculture, Government Printing Office, 1888.
- Nelson, A., "The Red Desert of Wyoming and Its Forage Resources"; Bulletin 13, Division of Agrostology, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1898.

- Nimmo, Joseph, Jr., "Report in Regard to the Range Cattle Business of the U. S."; Treasury Department, Bureau of Statistics, Document No. 690; reprinted without Maps as House Ex. Document 267, 48th Congress, 2nd Session; Serial 2304; Government Printing Office.
- Norgaard, V. A., and Mohler, J. R., "Blackleg; Its Nature, Cause, and Prevention"; Circular 31 (Sixth Revision); Bureau of Animal Industry, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1915.
- "On a Mexican Mustang Through Texas, from the Gulf to the Rio Grande"; S. S. Scranton & Company, Hartford, Connecticut, 1883.
- ommel, L. H., "Notes on the Grasses and Forage Plants of Iowa, Nebraska, and Colorado"; Bulletin 9, Division of Agrostology, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1897.
- Parkman's Oregon Trail.
- Paxon, F. L., "The Cow Country"; in American Historical Review, Volume 22, 1916-17.
- Pearl, Dr. Raymond, "The Nation's Food"; W. B. Saunders Company, Philadelphia, Pennsylvania, 1920.
- "Plato, The Republic of"; Translated by B. Jowett; Oxford University Press, 1888.
- Potter, Ermine L., "Western Live-Stock Management"; (The Rural Science Series, L. H. Bailey, Editor), The Macmillan Company, New York City, 1917.
- Powell, J. W., "Lands of the Arid Region of the United States"; special report, Second Edition, Geological Survey of U. S., Government Printing Office, Washington, D. C., 1875.
- Proceedings of the 24th Annual Convention of the American National Livestock Association, held at El Paso, Texas, January 12, 13, and 14, 1921.
- "Protected Stock Range in Arizona"; Bulletin 177, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1910.
- "Public Domain Grazing Lands Grabbed"; Article in Non-Partisan Leader; issue of November 11, 1918.
- Raht, Carlyle Graham, "The Romance of Davis Mountains and Big Bend Country"; The Rahtbooks Company, El Paso, Texas, 1919.
- Ramsey's "History of South Carolina".
- "Range Improvement in Central Texas"; Bulletin 13, Bureau of Plant Industry, United States Department of Agriculture, Government Printing Office, Washington, D. C., 1902.
- "Range Management", Separate No. 419, Yearbook of United States Department of Agriculture for 1906; Government Printing Office, Washington, D. C., 1907.

- "Range Management in the State of Washington"; Bulletin 75, Bureau of Plant Industry, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1905.**
- "Regulations Respecting Grazing Lands in Manitoba, Saskatchewan, and Alberta"; The Minister of Agriculture; Government Printing Office, Ottawa, 1914.**
- "Regulations for Wool Warehouses"; Office of the Secretary, Circular 150, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1920.**
- "Report of the National Agricultural Conference, January 23-27, 1922"; Document No. 195, 67th Congress, 2nd Session; House of Representatives; Government Printing Office, Washington, D. C., 1922.**
- "Report of the Public Land Commission"; The Public Domain and Its Disposition to June 30, 1904; Document No. 189, Volume 4, Senate, 58th Congress, 3rd Session; Government Printing Office, 1905.**
- "Retail Prices, 1907 to December, 1914"; Whole Number 156, Bulletin of the United States Bureau of Labor Statistics, Department of Labor; Government Printing Office, 1915.**
- Richtofen, Baron von, "Cattle Raising on The Plains of Texas."**
- Ritzman, E. G., "Some Fundamental Factors That Determine Progress in Farm Sheep Breeding"; Technical Bulletin 14, New Hampshire Agricultural Experiment Station, Durham, New Hampshire, 1919.**
- Roberts, John, "Meat Production, Consumption, and Foreign Trade in the United States, 1907 to 1920"; mimeographed circular, Bureau of Animal Industry, United States Department of Agriculture, Washington, D. C., (1922).**
- Roosevelt, Theodore, "An Autobiography"; Charles Scribner's Sons, New York, 1921.**
- Roosevelt, Theodore, "Ranch Life and the Hunting Trail".**
- Roosevelt, Theodore, "The Winning of the West"; G. P. Putnam's Sons, Philadelphia, Pennsylvania.**
- Sampson, Arthur W., "Climate and Plant Growth in Certain Vegetative Associations"; Bulletin 700, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1918.**
- Sampson, Arthur W., "Important Range Plants"; Bulletin 545, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1917.**
- Sampson, Arthur W., "Natural Revegetation of Range Lands Based Upon Growth Requirements and Life History of the Vegetation"; Reprint from Volume III, No. 2, Journal of Agricultural Research, United States Department of Agriculture; Government Printing Office, Washington D. C., 1914.**
- Sampson, Arthur W., "Plant Succession in Relation to Range Management"; Bulletin 791, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1919.**



- Sampson, Arthur W., "Range Improvement by Deferred and Rotation Grazing"; Bulletin 34, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1913.
- Sampson, Arthur, W., "The Reseeding of Depleted Grazing Lands to Cultivated Forage Plants"; Bulletin 4, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1913.
- Sampson, Arthur W., and Weyl, Leon H., "Range Preservation and Its Relation to Erosion Control on Western Grazing Lands"; Bulletin 675, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1918.
- Sayles, John and Henry, "Real Estate Laws of Texas and Actions to Try Titles and for Possession of Land and Tenants"; The Gilbert Book Company, Saint Louis, Missouri; Volume I, 1890; Volume II, 1892; Supplement, 1901.
- "Schedule K—Wool"; Message from the President of the United States (to Congress); Document No. 74, 62d Congress, 1st Session; House of Representatives; Government Printing Office, Washington, D. C., 1911.
- Service and Regulatory Announcement No. 9, Office of Markets and Rural Organization, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1916.
- Shantz, Homer Leroy, "Natural Vegetation as an Indicator of the Capabilities of Land for Crop Production in the Great Plains Area"; Bulletin 201, Bureau of Plant Industry, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1911.
- Sheets, E. W., "Influence of Winter Rations on the Growth of Steers on Pasture"; Department Circular 166, United States Department of Agriculture; Government Printing Office, Washington D. C., 1921.
- "The Shoddy Industry vs. The Virgin Wool Industry"; issued by the National Sheep and Wool Bureau of America, printed by Y. V. Hayley & Co., Chicago, Illinois, 1919.
- Smith, Adam, "Wealth of Nations"; London, 1776.
- Smith, J. G., "Fodder and Forage Plants, Exclusive of the Grasses"; Bulletin 2, Division of Agrostology, United States Department of Agriculture; Government Printing Office, 1900, (Revised Edition).
- Smith, J. G., "Grazing Problems in the Southwest"; Bulletin 16, Division of Agrostology, United States Department of Agriculture; Government Printing Office, Washington D. C., 1899.
- Spillman, W. J., "What is Farm Management?"; Bulletin 763, Bureau of Plant Industry, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1910.
- Spragg, F. A., "Forage Conditions of Central Montana"; Bulletin 36, Montana Agricultural Experiment Station, Bozeman, Montana, 1902.
- Taylor, H. C., "Agricultural Economics"; The Macmillan Company, New York City, 1919.
- "Tentative Regulations for Wool Warehouses, Under the United States Warehouse Act", Service and Regulatory Announcement No. 57, Bureau

of Markets, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1920.

"The Texas Emigrant"; 1840.

"Texas; The Rise, Progress and Prospects of The Republic of Texas"; 2 volumes, 1841.

Thrall's "Pictorial History of Texas."

Thorner, J. J., "The Grazing Ranges of Arizona"; Bulletin 65, Arizona Agricultural Experiment Station, Tucson, Arizona, 1910.

Thorner, J. J., (of Arizona Experiment Station), "The Practical Application of the Kent Grazing Bill to Western and Southwestern Grazing Ranges"; an address delivered at 17th Annual Convention of the American National Live Stock Association; published by the Association at Denver, Colorado, 1914.

Tiedeman, Christopher G., "Real Property"; Third Edition, Saint Louis, Missouri, 1906.

Topographical Maps, Fort McKavett and Rocksprings sheets, Department of the Interior, United States Geological Survey, Washington, D. C., 1893, (reprinted in 1916).

"Truth in Fabric; A Nationwide Expression of Opinion Favoring Truth—Justice—Square Dealing"; (resolutions), published in pamphlet form by National Sheep and Wool Bureau, Chicago, Illinois, 1920.

Udden, Dr. J. A., Baker, C. L., and Bose, Emil, "Review of the Geology of Texas"; Bulletin 44, University of Texas, Austin, Texas, 1916.

"The Use Book"; Forest Service, United States Department of Agriculture; Government Printing Office, 1915, (Revised 1918).

Valgren, V. N., "Bank Loans to Farmers on Personal and Collateral Security"; Bulletin 1048, United States Department of Agriculture; Government Printing Office, 1922.

Valgren, V. N., and Englebert, Elmer E., "The Credit Association as an Agency for Rural Short-time Credit"; Circular 197, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1921.

Vasey, G., "The Agricultural Grasses and Forage Plants of the United States"; Special Bulletin, Division of Botany, United States Department of Agriculture; Government Printing Office, Washington D. C., 1889.

Von Thunen, J. H., "Der Isolierte Staat"; Verlag von Gustav Fischer; Jena, 1821.

Ward, W. F., "Cottonseed Meal for Feeding Beef Cattle"; Farmers' Bulletin 655, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1915.

Warren, Dr. G. F., "Farm Management"; The Macmillan Company, New York City, 1913.

Williams, G. P., "The Angora Goat"; Farmers' Bulletin 1203, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1921.

- Williams, R. H., "Feeding Yucca to Starving Cattle"; Circular 21, Arizona Experiment Station, Tucson, Arizona, 1918.
- Williams, R. H., "Fattening Native Steers for Market: 1920"; Bulletin 91, Arizona Agricultural Experiment Station; Tucson, Arizona, 1920.
- Williams, T. W., "A Report Upon the Grasses and Forage Plants and Forage Conditions of the Eastern Rocky Mountain Region"; Bulletin 12, Division of Agrostology, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1898.
- Wilson, Thomas E., "The Producer, the Packer and the Public"; a statement issued by Institute of American Meat Packers, Chicago, Illinois.
- "Wholesale Prices, 1890 to 1914"; Whole No. 181, Bulletin of the United States Bureau of Labor Statistics, Department of Labor; Government Printing Office, Washington, D. C., 1915.
- "World Peace and Sheep Husbandry"; booklet issued by National Sheep and Wool Bureau of America, in 1919.
- Woodward, T. E., et al, "The Making and Feeding of Silage"; Farmers' Bulletin 578, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1914.
- "The Wool-Growing Industry"; (Report of) United States Tariff Commission; Government Printing Office, Washington, D. C., 1921.
- "The Wool Trade of the United States"; History of a great Industry; Its Rise and Progress in Boston, Now the Second Market of the World. Document No. 70, 61st Congress, 1st Session; U. S. Senate; Government Printing Office, Washington, D. C., 1909.
- Wool Yearbook, 1921.
- Wooten, E. O., "Carrying Capacity of Grazing Ranges in Southern Arizona"; Bulletin 367, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1916.
- Wooten, E. O., "Certain Desert Plants as Emergency Stock Feed"; Bulletin 728, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1918.
- Wooten, E. O., "Factors Affecting Range Management in New Mexico"; Bulletin 211, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1915.
- Wooten, E. O., "The Range Problem in New Mexico"; New Mexico Agricultural Experiment Station Bulletin 66, State College, New Mexico, 1908.
- Wooten, E. O., "The Relation of Land Tenure to the Use of the Arid Grazing Lands of the Southwestern States"; Bulletin 1001, United States Department of Agriculture; Government Printing Office, Washington, D. C., 1922.
- Wooten, E. O., and Standley, P. C., "The Grasses and Grasslike Plants of New Mexico"; Bulletin 81, New Mexico Agricultural Experiment Station; State College, New Mexico, 1911.
- Wright, Turner, and Bell, George, A., "Live Stock Conditions in Europe"; Separate No. 821, from 1919 Yearbook of United States Department of Agriculture; Government Printing Office, Washington, D. C., 1920.



