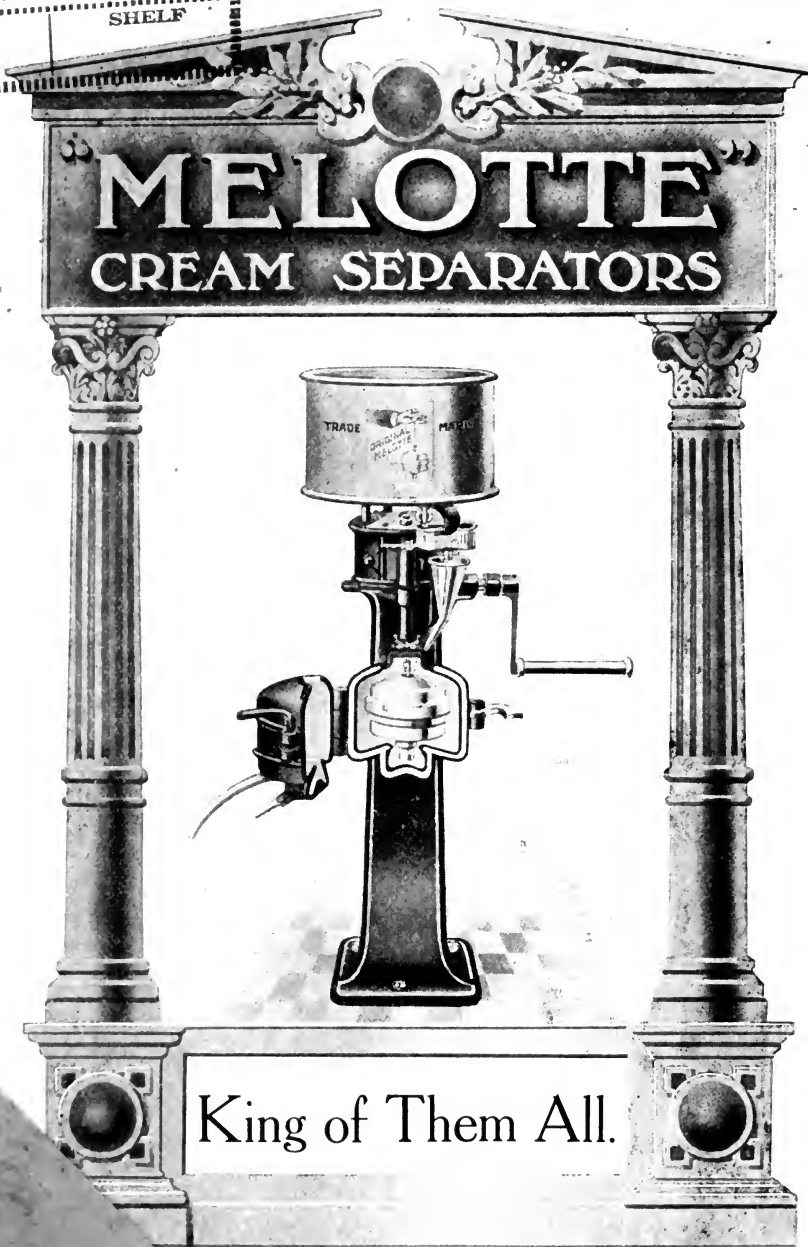


B 4 278 285

FIRST CENTURY
OF DAIRYING
IN NEW SOUTH WALES



Frank McCaffrey



King of Them All.

Work, Clean & Keep in Order.
—Skims Cleanest—

AGENTS IN ALL DISTRICTS.

RIEND & Co.,
SYDNEY.

Rec'd JAN 3 1923

The N.S.W.

8761 & NVF 7,028
Rec'd JAN 3 1923

Fresh Food & Ice Co.,

LIMITED.

Established by the late T. S. Mort in 1875.

PIONEERS

OF

The Frozen Meat Industry
 The Country Milk Trade
 Exportation of Butter
 Pasteurisation of Milk and
 Cream.

The Largest Purveyors

of

Food Products

IN THE STATE.

*Superfine Butter.**Pasteurised Milk & Cream.**Ice Manufacturers.**Fish, Game and Poultry Dealers*(Importers & Exporters.)*Fruit Merchants.**Bread, Pastry and Cake Manufacturers.*

The Largest Cold Storage Works in Australia.

Head Office and Refrigerating Works: HARBOR ST., SYDNEY.

Refreshment Rooms : KING ST., SYDNEY.

Retail Fish and Poultry Shop : KING ST., SYDNEY.

Branches and Agencies in all Suburbs.

— o o —

The N.S.W. Fresh Food & Ice Company,

LIMITED.

ESTABLISHED 1862.

Head Office :

George and Hunter Streets, Sydney.

THE


UNITED INSURANCE CO.

LIMITED.

FIRE Insurances effected on All Classes of Buildings and Contents, including Farms, Dwellings, Barns, etc.

MARINE Insurances accepted on Farm Produce, etc., coastwise, and to all parts of the world.

Wool and other Station Produce insured at and from Station to London or elsewhere.

Accident Insurance as per Arrangement.

Being a Local Company, having Large Capital and Reserves.

 **All the Profits are Retained in the State.** 

Manager :
THOMAS M. TINLEY

Secretary :
BARTON HAIGH.

Agents in Principal Towns Throughout all the States.

The Best to Drink!

“Auld Jock”

Whisky

TOOTH & CO. LTD. PROPRIETORS,
Kent Brewery,
Sydney

Great Popularity of Sunol Tobacco

S

U

N

O

L

S

U

N

O

L

ALL NATIONS PRAISE
SUNOL

*"I Guess an kalkerlate
 that no Tobacco an
 Airtli kin lich*

**SUNOL
 TOBACCO**

AWARDED
3 GOLD MEDALS.

For PURITY
 NATURAL AROMA
 and PERFECTION

SUNOL
 Cannot be Excelled.



SUNOL attained its present degree of high favor mainly by reason of one important departure, the manufacturers have wisely taken from the much abused modern method of making, viz, the total exclusion of perfumes or flavoring of any kind, retaining the leaf's original aroma, and excluding all injurious impurities.

SUNOL, Plug, Dk. or Bt. **6 0** lb. pst. fr.

SUNOL, Cut, D or B 11b bx **6 0** do. do.

SUNOL, Cut D or B 2ozpkts **6 6** do. do.

SUNOL, Cut D or B 1oz pkts **7 0** do. do.

MICK SIMMONS

HAYMARKET, SYDNEY, N.S.W.

Tobacconists & Storekeepers. Send for our
Tobacco, Sports and Fishing Tackle
Price Lists, Free.

Sales of **SUNOL** Daily Increasing

MICK SIMMONS - Sole Agents

Sutton Forest Meat Co.,

(RALPH WALKER & SONS)

WHOLESALE & RETAIL

**Butchers, Small-Goodsmen,
—and Bacon Curers—**

761 & 763 George-street, South

(opp. Christ Church),

—SYDNEY.—

TELEPHONE 1152.

Write for Price List.

Country Orders a Speciality.

William Inglis and Son,

Stock & Station Agents

Cattle Sheep, Pig, Horse,

Salesmen

and Pedigree Stock Agents.

HEAD OFFICE

ESTABLISHED 1867.

244 PITT STREET, SYDNEY.

Fat Cattle and Sheep—

At Flemington, Mondays
and Thursdays.

Calves—

At the Corporation Yards,
Sussex-street, every
Wednesday.

**Milch Cows Dry Cattle
Calves Lambs, and Pigs—**

At our Railway Yards
(adjoining Railway Un-
loading Station), every

Thursday.

Pigs—

At the Corporation Yards,
Sussex-street, on Tues-
days, Wednesdays, and
Fridays.

Horses—

At our Bazaar, Pitt and
Castlereagh streets,
Daily; and at Camper-
down according to ar-
rangement.

BARNES

(B)

Bacon and Hams

UNSURPASSED.

½

 *Awarded Gold Medal at Franco-British Exhibition, 1908.*

Also Agents for Hicks' Famous O.K. Bacon

All Classes of Dairy Produce and
Live Stock Sold on Commission

Careful Attention Given, and
Returns Promptly Made.

WE SOLICIT A TRIAL.



— SYDNEY.

Photographs of Illawarra Cattle.

Photographs of the Prize-winning
Cattle of the South Coast.

Dairy Farms, and Stock Stations
Photographed in any part of District.

The Illustrations in this book are
supplied by me.

SAMUEL COCKS, Photographer,

Studios: Manning Street, KIAMA, N.S.W.

Stewart & Morton



JOHN STEWART.

General
Auctioneers
and
Valuers.

Established 1888

Sales Conducted
throughout the South
Coast.

Head Office:

NOWRA.



M. F. MORTON.

OFFICES AT

Berry, Gerringong, Kiama and Albion Park.

Careful Valuations Made. Dairy Cattle Selected and Purchased to Order

The Selection of Dairy Cattle a Speciality.

Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation



Yours faithfully
Frank McCaffrey

FIRST CENTURY
OF DAIRYING
IN
NEW SOUTH WALES

637

BY FRANK McCaffrey.



All Rights Reserved.

Sydney :
Sydney and Melbourne Publishing Co., Ltd.,
74a Pitt St, Sydney,

1909.



A FOREWORD.

I have much pleasure in writing a foreword for this interesting and instructive addition to the dairying literature of New South Wales.

The author, Mr. Frank McCaffrey, got his early practical training in the best of all schools—on his father's dairy farm in the Jamberoo district. When the Separator was introduced to this State, he was selected to take charge of one of the earliest butter factories in the same district, where I first made his genial acquaintance, twenty years ago; and he subsequently made an excellent name as a practical instructor when in charge of the travelling dairy sent out by the Department of Agriculture in 1891.

He has taken infinite pains to get from the historical records and oldest Gazettes in the Public Library the exact facts about the earliest introduction of different strains of pure-bred cattle into this State, and has gauged with intelligent discernment their relative value in making the famous Illawarra breed, and in fixing other types of our dairy cattle. He has also rescued from oblivion the names of the principal pioneers in the Dairying industry of the South Coast, and has given them their well-merited place on our roll of agricultural honor.

All these facts he has brought together in this book, and they must be of distinct value to all students of our dairying industry.

While not professing to be a literary expert, the author sometimes allows his Celtic fire and imagination some little play, and evidence of his wide and careful reading is present on every page. His numerous old friends and all earnest students of our agricultural development will welcome this book, and give it an honored place on their shelves.

I have no doubt that it will be found to supplement most happily the text-books now in use, and the practical instruction now given at our College and Farm Schools, both in the field and in the dairy.

Henry C. L. Anderson.

Sydney, 3rd September, 1909.

CONTENTS.

A FOREWORD: By H. C. L. Anderson, M.A., Under Secretary,
Department of Agriculture, New South Wales.

PART I.—HISTORICAL.

Chapter.	Page.
I.—INTRODUCTORY	17
II.—FIRST AUSTRALIAN SETTLEMENT	21
III.—THE BIRTH OF ILLAWARRA	27
IV.—STRUGGLES OF THE EARLY SETTLERS	35
V.—OPENING UP THE COLONY	42
VI.—FOUNDING THE ILLAWARRA HERDS	50
VII.—IN THE FIFTIES AND SIXTIES	58
VIII.—ILLAWARRA IN THE SEVENTIES	67
IX.—THE DAWN OF DAIRYING CO-OPERATION	75
X.—THE BEGINNINGS OF THE AGRICULTURAL SOCIETIES	83

PART II.—THE ORIGIN AND BREEDS OF CATTLE.

I.—THE ORIGIN OF CATTLE	93
II.—THE DIFFERENT BREEDS.. .. .	104
III.—THE SHORTHORN	108
IV.—THE AYRSHIRE	117
V.—THE CHANNEL ISLANDS BREEDS	128
VI.—ON WHITE CATTLE IN GENERAL	137
VII.—WHITE CATTLE	143
VIII.—HOLLAND CATTLE	148
IX.—THE IRISH BREEDS OF CATTLE	152
X.—THE HERFORD	158
XI.—THE DEVON	160

PART III.—CATTLE REFLECTIONS OF A LIFETIME.

I.—CHANGES IN OLD TIME CATTLE	162
II.—ON A NEW THEORY OF BREEDING CATTLE	167
III.—WHAT CONSTITUTES A GOOD DAIRY BULL	171
IV.—REMINISCENCES OF ILLAWARRA	183
V.—DAIRYING IN THE GOLD FEVER DAYS	189
VI.—ON FEEDING AND PRODUCTION	192
VII.—ON THE REARING OF HEIFER CALVES	199
VIII.—ON BREEDING DAIRY CATTLE.. .. .	201
IX.—ON THE INTERMINGLING OF BREEDS	211
X.—THE PECULIARITY OF BREED	216
XI.—THE BATTLE OF THE BREEDS.. .. .	224
XII.—RETROSPECTIVE REFLECTIONS	229

PART IV.—PRACTICAL ADVICE TO DAIRYMEN.

I.—ON FEEDING CATTLE	235
II.—ON BREEDING	245
III.—ON THE CALF	249
IV.—MILK FEVER OR DROP AFTER CALVING	252
V.—THE MILK MIRROR	256

VI.—MILK TESTING.. .. .	259
VII.—TUBERCULOSIS	263
VIII.—ABORTION IN COWS	270
IX.—BLACKLEG	274
X.—ON SELECTION	276
XI.—PRACTICAL HINTS FOR DAIRYMEN FROM MODERN WRITERS	277
XII.—FIFTY DAIRY RULES	283
XIII.—A FEW PRACTICAL HINTS TO CREAM RAISERS	287
XIV.—CHEESE MAKING	289
XV.—PIG RAISING	293
XVI.—THE HORSE	300
XVII.—ON SOILS	305
XVIII.—ON THE SILO	309
CONCLUDING REMARKS	315
APPENDIX	319

ILLUSTRATIONS.

Frontispiece.

Cow, Fussy II. (Hugh Dudgeon, owner)	16
Cape of Good Hope Cattle	19
Devonshire Bull imported by Lieutenant Kent in 1800	22
Typical Longhorned Cow. The Celebrated Dairy Cow "Beach"	25
Some Early Pioneers (H. Osborne, C. Throsby, H. Badgery, W. Jenkins, C. McAlister, J. Robb)	33
Australian Stockman of Early Days	37
Typical Illawarra Dairy Cow	37
Another Group of Pioneers (G. Grey, J. Colley, N. Craig, J. Black, H. Fredricks, W. Grey)	45
Hardy Illawarra Pioneers (W. Moles, J. McGill, J. Russell, W. James, J. Dunster, H. Bartlett)	51
Sturdy Illawarra Settlers (S. Marks, J. Hanrahan, C. McCaffrey, E. Larkin, H. Dudgeon, G. Wood)	55
Well-known South Coast Men (J. Brown, Evan Evans, A. Campbell, J. Lindsay, F. O'Donnell, W. Musgrave)	59
Illawarra Men of Mark (W. Lovegrove, D. Hyam, J. Wilson, D. Boyd, T. Brown, J. Love)	63
Four Splendid Types of Pioneers (W. Coman, J. Grant F. McMahon, T. Cork)	65
Group of Leading Bega Settlers (J. Farragher, J. Collins, J. Keys, R. Ritchie, W. Allan, W. Rixon)	69
Prominent Men in the Seventies and Eighties (M. Hindmarsh, J. Miller, G. Tate, J. Sharpe, D. Dymock, S. Grey)	73
Prominent South Coast Public Men, Past and Present (A. Berry, T. S. Mort, Captain Charles, J. Marks, Sir John Hay, Sir Joseph Carruthers)	79

First Presidents of South Coast Agricultural Societies (E. F. Wood, D. Irvine, Dr. R. Menzies, H. G. Morton, J. Miller, L. McIntyre)	85
Kiama in 1869 and Kiama in 1909	87
Some of the Presidents of South Coast Agricultural Societies in 1908 (H. D. Morton, A. Colley, G. Lindsay, H. Robb, H. McKenzie, J. W. Musgrave)	91
Cows, Fuchsia and Betsy (E. J. Marks, owner)	95
Bulls, Emblem and Banker II.; Cows, Melba and Oonah (Scottish Australian Investment Co., Ltd., owners)	100, 101
Shorthorn Bull, Royal Windsor (late E. B. Woodhouse, owner)	109
Bull, Aristocrat of Oakdale; Cow, Tory of Oakdale (George Tate, owner)	113
Bull, Jemie of Oakbank; Cow, Jenny of Oakbank (late Sir John Hay, owner)	118
Bull, Atlanta's Prince of Meroo; Cow, Aid of Oakbank (C. Lamond, owner)	119
Champion Group of Ayrshire Cattle (owner, the late Sir John Hay)	123
Ayrshire Cows, Whinflower of Oakbank and Sophia IV. of Coolangatta (owner, the late Sir John Hay)	125
Channel Island Breeds: Bull, Eridge Park (owner, David Hyam); Cow, Lady Clare (owner, T. O'Shea)	131
Cows, Blossom II. and Blossom III. (owner David Hyam)	135
Cows, Daisy, Modesty, and Fussy II. (owner, Hugh Dudgeon)	141
Cows, Lucky of Oakdale (owner George Tate) and Perfection (owner, Moses King)	149
Bull, Belmore; Cow, Fairy (owner, J. W. Musgrave)	157
Bulls, Pirate King (owner, Alex. Campbell), Guss of Coolangatta (owner, T. Brown)	163
Cows, Dumplin II. and Butterfly (owner, George Grey)	169
Cows, Gentle, Favorite, and Butterfly (owner, E. J. Marks)	179
Friesian Bull, Edinglassie; Ayrshire-Friesian Cow, Beautie (owner, Alex. Lamond)	185
Model Dairy Cow, Honeycomb (owner, late John Lindsay)	195
Cows, Blossom, Queen II. and Model (owner, E. J. Marks)	205
Bulls, Barney II. of Nethervale (owner, J. M. Miller), and Barney II. of Alyne Bank (owner, John Love)	220
Cows, Snaily and Model (owner, J. M. Miller)	221
Cow, Tot of Oakdale (owner, George Tate)	239
Shorthorn Dairy Cows, Favorite, Kate, and Princess (owners, James Bros.)	247
Bull, Sunnyvale (owner, A. F. Warden)	253
Cow, Alice (owner, James Bros.)	253
Lady and Gentleman's Hackney, and An All-round Horse (owner, Arthur Grey)	301



Fussy II. Bred by Messrs. McGill Bros., Croome, Shellharbor, New South Wales.
The property of Mr. Hugh Dudgeon, Hill View, Jamberoo, New South Wales.
Fussy II.'s dam was Fussy I. Bred by and the property of the late Mr. James McGill, of Croome, Shell harbor.

PART I.

CHAPTER I.

INTRODUCTORY.

In writing history it is not easy to distinguish between what we have seen, heard, read, or even practised. This is particularly the case when one writes for the public, where there are always certain formalities and many considerations to be observed. Reason and experience tell us that to be able to form a proper conception of the advancement in dairying, its development in New South Wales, and to describe its many material and moral aspects it is necessary to have lived and travelled for a considerable time in the country, and to have been in constant intercourse with the people engaged in the industry, never tiring of asking questions, and taking careful observations of their systems of breeding dairy cattle.

Few men rise completely above the circumstances which surround them. Few there are who incur great danger for the sole cause of truth. There are cases in which silence is not only prudent, but obligatory; and therefore the reader must pardon the writer for not saying all he had on his mind, if he says nothing contrary to it.

When the idea first caught on with the writer of placing on record the many things that interested him whilst reading the histories of practical pioneers, together with the accounts of their stock, and chatting with these old pioneers and noting down their experiences, as well as when travelling over the scenes of these operations, he was fully alive to the fact that we are not always able to acquire knowledge of the existence of a thing by ourselves, but that we must avail ourselves of the testimony of others; and that two conditions are required to prevent this testimony from leading us into error—namely, that the witness be not himself deceived, and that he has no desire to deceive us.

In a work of this kind many interesting stories of pioneering days must be omitted for obvious reasons. Statements have to be made to show facts which have to be stripped of their personal bearing. A repetition of facts relating to the history of the various herds of cattle in use by the pioneer breeders could not well be avoided owing to the few notable cattle breeders being largely associated in so many localities. These and many other obstacles have to be overcome as far as the writer's abilities served him whilst bringing a nebulous mass of notes and references into a somewhat concrete form.

The chief object of this work is to trace the origin of those cattle which, at one time or another, were introduced into the Illawarra and other districts of this State, and trace which of those breeds had been introduced and reproduced in the Cumberland, Camden, Illawarra, and Shoalhaven districts from surrounding regions.

The dairy cow and her various characteristics are, of course, quite familiar to everyone conversant with cattle raising. Nevertheless, opinion varies as to what constitutes a really first-class dairy cow, and

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

this difference of opinion the world over has given rise to the scores of breeds to be found to-day. Ancient authors inform us that certain breeds obtained for centuries back altered from time to time according to fancy or requirement, with an occasional cry back to their prototypes. As to the history of the cow in the service of man, suffice it to say that every writer of note covers up his shortcomings by stating that "the origin of this breed is lost in antiquity." Most of the wealth of the Celtic Kings of Ireland consisted of cattle. The very word "chattels" comes from this root. One of the fiercest battles fought in those mystic centuries prior to the birth of St. Patrick was over the exchange of a white for a brown bull.

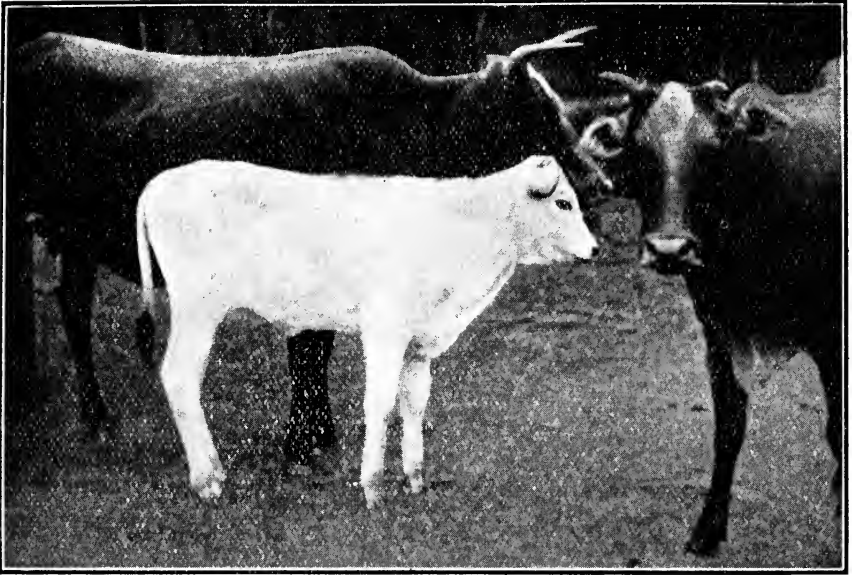
While on this point it is interesting to note that it was the crowned heads of Europe that were largely instrumental in preserving for us the foundations of the herds and flocks we are so proud of to-day. Spain, besides the merino sheep, gave us the Spanish cow, Holland the Friesian, Scotland the Ayrshire and Polled Angus, England the Shorthorn, Hereford, Devon, Red Sussex, Ireland the Longhorns and Kerry cattle, Wales the Pembroke, France and the Channel Isles those splendid specimens the Normandy, Brittany, Jersey, and Alderney.

Any attempt to fix a common origin for various breeds cannot fail to prove confusing. Study serves only to convince one that our herds have sprung from at least two semi-aboriginal breeds. Take, for example, the Friesian, Durham, Holderness, Pembroke, Longhorn, and Normandy cattle, and compare them with the Ayrshire, Suffolk, Kerry, Jersey, and Brittany breeds; a moment is enough to notice the vast difference in size, character, and temperament between the larger and smaller breeds, though they may be raised generation after generation on practically the same food. No amount of feed or change of climate, so far as we know, could change a Kerry into, say, a Durham, or a Durham into a deer-like Jersey cow in the course of a few generations. We cannot fail to notice something remarkable about all well-known and tried breeds. As a celebrated authority puts it :—

"There are three systems, to which all the organs are directly or indirectly subsidiary, and are united in the plan in which the dairy cow is formed. There is the nutritive system, composed of stomach, intestines, liver, pancreas, glands, and vessels by which food is elaborated, effete matter removed, the blood manufactured, and the whole organisation nourished. Then there is the nervous system, which co-ordinates all the organs and functions, and enables the animal to entertain relations with the world around it, directing it what to avoid and what to approach, and without which so much complexity of structure as finds place in her organisation would be constantly at fault. There is, again, the reproductive system by which a succession of animals is secured, and the hold of the race on the earth assured." The breed of cow that we should desire must have these systems each in health and order.

The cow in nature lives to one end, the keeping alive the race, as plants have all their energies concentrated to produce seed. The domesticated cow, on the other hand, lives to continue her race and to nourish human beings, so that every support must be given to whatsoever will tend to develop her whole organism into the form and activity that conduces to this double service. "Bichat" has defined life to be organisation in action. The most productive cow, like the most productive man in mental and physical labor, lives an intense life. Life, in the sense of motion—birth and death of cells in the organism—is lived doubly when the activity is of double measure. This quickened life we conceive to be one of the marked characteristics of the Ayrshire, Brittany, Jersey, and Kerry cows. It is, therefore, the animal that unites this vitality in a form that favours

INTRODUCTORY.



A Group of Cape of Good Hope Cattle of similar type to those imported to New South Wales by Captain Phillip in 1788, showing cream-colored calf sired by an Ayrshire bull.



A Cape of Good Hope Bull of similar type to those imported to New South Wales by Captain Phillip in 1788.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

most economical production, with parts adjusted in symmetrical relations and proportions, that constitutes the perfect cow, and Ayrshire breeders claim this for the Ayrshire. So do those who favour the other breeds mentioned. Many are to be found who suggest that the Ayrshire is simply the product of previous judicious crossing of some common breed of domesticated cows with the wild white bulls to be found in the forests of Britain. Yet there clings to the Ayrshire an indescribable something, an air, a style, that sets her apart from all others. . In other words, she is a distinct type of cow.

If, however, one is allowed to venture an opinion on the suggested crosses, the writer would favour the theory that the Ayrshire, together with the other smaller breeds, is the descendant of the original semi-wild white and black breeds of Britain, and the Holderness and similar breeds of domesticated cattle are representative of a larger type. Much inquiry has failed to clear up the origin of the Shorthorn, but the cattle of the Baltic and North Sea provinces appear to have possessed many of their characteristics, including excellent milking qualities. The modern Shorthorn is undoubtedly descended from the Longhorned Durham, which were descended from the Longhorns.

Prior to 1750 British breeds were prized for their great milking qualities. But the effect of the Napoleonic wars was to force up the prices of meat and grain so high that nearly all the milk breeds were superseded by animals that produced nothing but their progeny and casks of beef. Blakewell, of Dishley, systematically improved the beef-producing qualities of the Irish Longhorns, but left no records, so his system remains a secret, beyond the fact that he in-bred extensively. Bates improved on the beef-producing qualities of Bakewell's Longhorns, and produced what was afterwards known as the Longhorned Durham by a system of in-breeding without any mixture of new blood—a system which he claimed added largely to the beef-producing qualities of his stock without deteriorating their milking qualities.

In 1777 Mr. Charles Collings purchased Hubback to serve a purpose which has never been clearly explained. It appears, however, that he was a great feeder, and responded quickly to generous treatment, which goes to prove that he put on beef at a rapid pace. Hence, according to Coates, he was the foundation of the "improved Shorthorns." His color was yellow-red and white, with clear waxy horns, deep large body, and mild bright eyes, a description, curiously, that would apply to the Spanish cattle and bred them with a special system of his own.

CHAPTER II.

FIRST AUSTRALIAN SETTLEMENT.

Turning to the beginning of stock raising in Australia, the penal nature of the settlement was scarcely favourable at first. There were cows on board the first fleet, principally of the Bengal breed, although there were also cows shipped from England for the use of the officers and their families. They are seldom mentioned in any of the official reports for obvious reasons. . . . In 1800 Captain Kent imported a Devon bull and a few Durham cows, which he afterwards sold to the New South Wales Government at long prices. A picture of Captain Kent's bull appears on the next page. The insurrection against Governor Bligh, headed by Captain John Macarthur, marks the dawn of squatterdom in Australia. The disaffected were anxious to have the lands unlocked; the British authorities favoured, but Bligh opposed granting Macarthur 5000 acres, and threatened he should not keep his 10,000 acres at Camden.

In 1805 there were in New South Wales 2000 male and 3000 female cattle. After the recovery of the "wild cattle," a well-known incident, which gave us the name "Cowpasture," the beasts having strayed away while Phillip was Governor, Phillip put in a claim, stating that the majority were his private property, and received 100 cows, fifty heifers, and fifty oxen, then worth about £10,000. In Bligh's time the brothers Blaxland arrived, and went in for stock raising. In 1803 a general order for the breeding of stock had set apart large areas round Sydney, and animals from the Government herds were paid for by instalments. From 1799 to 1802 nearly every ship brought out cattle, and shipments of the best British breeds continued for years.

The first cultivation by free or freed men settlers is interesting as marking the initial step towards making the colony self-supporting. The former class was made up of mechanics and others engaged to instruct convicts, as well as of soldiers whose service had expired (the place at which they settled was called "Field of Mars"); the latter of prisoners who had received their liberty. A paternal Government assisted them in many ways, including the use of convicts. The way the land grants were made continued in abuse right up till 1813, when they ceased, and this is of a piece with the whole history of our land policy. To illustrate early values, in 1793 an English cow in calf brought £80, and a calf, a bull, was subsequently sold for £15. And though almost every ship brought cattle either on order or as a speculation of the captain, prices did not decrease. At the end of 1796 the dairy cattle numbered nearly 200, not including those at the Cowpasture. The latter were in a grassy tract from which they were not likely to move, and Governor Hunter had them protected as a reserve against emergencies. On his departure in 1800 the colony's figures had grown to 332 bulls and oxen, and 712 cows. He erected several stockyards for the protection of horned cattle.

In Governor Bligh's time the Messrs. Blaxland arrived in the colony, and having received a grant of 1290 acres of land, one of the brothers at once went in for stock raising, and selected from the Government herds sixty cows, one bull, and four bullocks. The land in those days and for years afterwards was granted at a quit rental of so much per year according to approximate value, the Government holding thereby the power of resuming any lands that might afterwards be required for other purposes. The stock were obtained from the Government herds on the promise of payment in instalments according to the estimated value of the animals or other varying circumstances. In



A Devonshire Bull Imported to New South Wales by Lieutenant Kent in 1800.
From an Old Print 110 Years Old.

11

FIRST AUSTRALIAN SETTLEMENT.

order, therefore, to keep up a supply of stock for the use of settlers, a "General Order" was issued by the Governor in 1803, as follows :— "For the preservation, increase, or breeding of stock, portions of lands there reserved or set apart and leased in those districts as under— Nelson district, in Mulgrave Place, 5650 acres ; Richmond Hill district, Mulgrave Place, 5130 acres, land bounded by Smith and Webb's farms on Yellow Munday's Lagoon, south side of the Hawkesbury River ; Phillip district in Mulgrave Place, 6150 acres ; Prospect Hill district, including Toongabbie and the west side of Seven Hills, 9345 acres ; Baulkham Hills, 3880 acres ; Field of Mars and eastern farms, 5050 acres.

In 1799, 1800, 1801, 1802, nearly every ship that arrived from England carried cattle, averaging from one to twenty head of the various British breeds. Cows that were brought out for the ship's use were, as a rule, sold on the wharf at Sydney ; the larger numbers were generally on consignment to either the Government or wealthy settlers.

During those years much correspondence was carried on between the colonial authorities and the British Government with a view of getting cattle from Madagascar instead of the Cape of Good Hope. the Madagascar cattle being considered by the colonial authorities superior to the Cape cattle, the latter being merely crossbred buffaloes.

In 1791 his Majesty's ship Gorgan arrived from Cape of Good Hope with one bull calf and sixteen cows on board. The Marquis Cornwallis arrived from same place with a consignment of cattle for the Government consisting of 158 cows and 20 bulls.

In 1793 Captain John Macarthur had increased his herd of Longhorned cattle to fifty head, valued at £1850; and the Rev. Mr. Marsden was considered the largest and most successful farmer in New South Wales. During this year the cattle, the offspring of those few head which strayed away from the settlement whilst Captain Phillip was busily engaged clearing and fencing in a vegetable garden somewhere near Hunter-street, were discovered at what has since been known as the Cowpastures. Their numbers had increased beyond modern calculations.

The ships Shah Hormuzear and Daedalus arrived in 1793. The former had on board one bull and twenty-four cows, and the latter had six bulls and twelve cows. These cattle were sold at the wharf on their arrival. The ship Endeavour arrived in 1795 with 132 head of cattle, consisting of six bulls, sixty cows, twenty-four calves, and forty bullocks.

During 1797 there were landed in Sydney the following numbers of cattle :—6 bulls and 77 cows.

It will thus be seen how the foundation of the immense herd of cattle was laid in the county of Cumberland during the first decade of our history. In the following decade, from 1797 to 1807, we perceive from abundant facts that cattle raising had become a most important branch of industry. At a sale of cattle belonging to Mr. William Cox, conducted by Mr. Robert Campbell, whose saleyards were where the Union Club now stands, a Longhorned-Durham bull brought £86, a Longhorned bull £57, a red and white Ayrshire bull brought £37, a Devon bull brought £35 ; two Shorthorn cows brought £120, and twenty cows brought £1226. Mr. Cox's dairy farm was situated in Woolloomooloo.

In 1803 the grant to John Macarthur, an ex-officer of the New South Wales Corps of 10,000 acres in the centre of the coveted Cowpastures caused much discontent. At the same date the value of cattle is indicated by the following sale prices :—Shorthorn bull, £86 2s. ; Longhorn bull, £37 6s. ; black and white Ayrshire bull, £25 4s. ; a pure Shorthorn cow, £79 16s. ; and 28 cows, £1526. Next year Governor

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

King established dairy farms at Parramatta and South Creek, where he introduced the best English-bred cattle. In 1806 the first cattle show took place on Sunday, July 13, at Parramatta. The Governor, King Major Johnston—and, these being less strictly Sabbatarian times—Rev. Samuel Marsden were present, they being, besides King, the owners of the 3000 head of cattle which were inspected. In 1807, on account of the large number held by the settlers, a Government proclamation announced the discontinuance of the practice of leasing stock. New settlements were formed for the disposal of Government stock from time to time. In 1808 we read of the Rev. Samuel Marsden making a journey to England, to import a consignment of Norfolk and Suffolk cattle.

In 1805 an Alderney bull was sold by Mr. Simon Lord for £50. The chief cattle raisers then were Rev. Samuel Marsden—who had the Red Polled Norfolk and Polled Suffolk Dun breeds; Captain John Macarthur, who had the Longhorned breed; Major Antil, Captain Kent, Major Johnston, and Captain King, who bred Durhams, Short-horns, Devons, and Herefords.

It is to Captain King the honor belongs of having established the first model farm in Australia. It was situated adjacent to Parramatta, and was kept as an object lesson for settlers. In 1806 the first cattle show took place on Sunday, July 13, at Parramatta. The Governor (Captain King), Major Johnston, and—these being less strictly Sabbatarian times—Rev. Samuel Marsden were present, they being besides Captain King, the owners of the 3000 head of cattle which were inspected. On this occasion a present of seventeen cows was made to the Female Orphan Institution at Parramatta. It was considered that Mr. John T. Palmer's herd, which he kept on his Woolloomooloo station, was one of the finest in the young settlement.

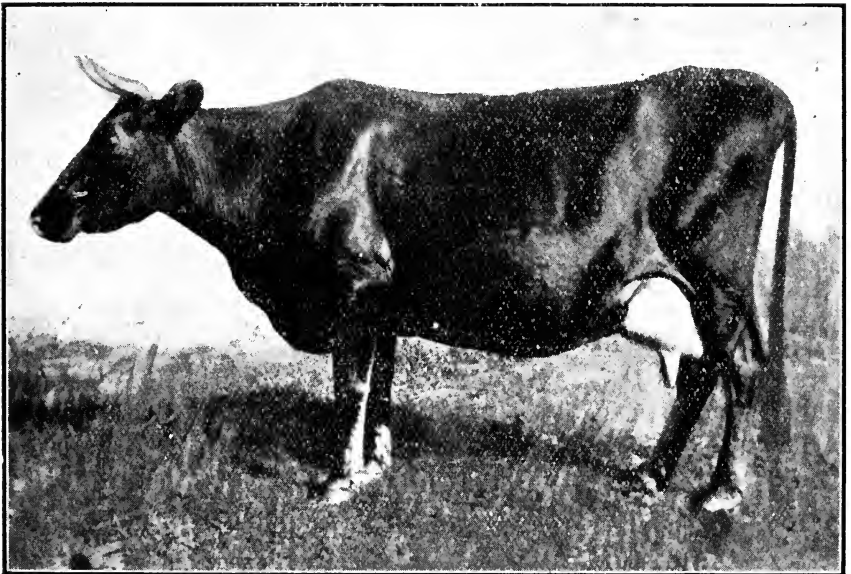
In 1808 the Rev. Samuel Marsden returned from a visit to England with a consignment of Red Norfolk and Suffolk Dun polled cattle for his farm at South Creek. South Creek about this time contained many herds of valuable cattle, among which was that of Mr. James Badgery. On the Nepean River Mr. John Jamison had a valuable herd of Devon and Hereford cattle, and Mr. Samuel Laycock had possessed himself of a very choice Ayrshire herd, described as large-bodied, red and white speckled animals. His farm was near Seven Hills, Parramatta.

1809 brings Sir Lachlan Macquarie on the scene as Governor of New South Wales. Macquarie was notable for two things, viz.—(a) having either the fore or aft part of his name attached to anything and everything found or discovered during the eleven years of his Governorship, and (b) the advancement of the colony by every means within his power.

The arrival of Lachlan Macquarie as Governor in 1809 was a landmark in our farming story. Between 1810 and 1821, under his regime, the number of horned cattle increased from 12,500 to 103,000, or 800 per cent., while the population ran from 11,500 to 29,500, clearly showing the remarkable progress of stock raising. The passage of the Blue Mountain Range, opening Bathurst Plains, and the discovery of the district called Bong Bong before Sutton Forest and Berrima were formed, gave an impetus to settlers, and those who had means started for the new regions. It gave breathing room to a cramped community. It moulded a distinct type of settler, characteristically independent. Leading Sydney merchants obtained large grants of land in good spots; small settlers were sent thereon, and received rations in return for their produce, agricultural and dairy. By similar exchange they obtained stock, which sometimes came directly from ship's captains, and to the order of the merchants.



A Typical ^{one} Cow of the Longhorned Breed, similar in type to those imported to New South Wales in 1805 by Captain John Macarthur, of Camden, New South Wales.



The Celebrated Dairy Cow Beach, typical of the Longhorned Durham breed. Bred from stock raised by the late William Coman, of Eurobodalla-Moruya, New South Wales.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

In 1811 we have the names of Messrs. Charles Throsby, sen., Blaxland Bros., Hassall Bros., McDougall Bros., Henry Cox, John Nichols, Richard Brooks, William Howe, George Johnston, S. Bradley, Andrew Thompson, Ebenezer Bunker, Robert Campbell, and Dr. White added to the list of breeders of stud cattle. In the years prior to this it was customary for the Governors to issue a proclamation each year for a general muster of cattle to be held at various periods of the year in the several localities where Government breeding stations were established under the charge of the superintendent of stock. It would appear that a system of cattle stealing was going on from the Government herds. This was discovered, and Governor Macquarie in 1811 issued orders that all the cattle in the colony be mustered and counted on the same day, so that the cattle inspected at, say, No. 1 station could not be driven over to No. 3 station and inspected and counted a few days later. The writer leaves the reader to form his own conclusions.

In 1813 an important sale of cattle took place at the Sydney markets by Mr. Bevan on account of Mr. Bayley. Primrose, a Red Lincoln cow, with calf at foot and in calf by Mr. Blaxland's Durham bull, brought £80. The dam of this cow was imported here by Colonel Foveaux. Jenny, a purebred Lincoln cow, whose granddam was "Scott," imported by Captain Scott, of H.M.S. Porpoise, with a female calf at foot and in calf by Mr. Blaxland's Durham bull, brought £60. "Tib," a Longhorned Durham, with bull calf at foot and in calf to Mr. Blaxland's Durham bull, brought £90. "Magpie," a granddaughter of the famous "Magpie," by Connolly's Friesian bull, with bull calf at foot and in calf to Mr. Blaxland's Durham bull, £50. "Cherry Longsides," a purebred Longhorn, bred by Captain John Macarthur, together with two Longhorned cows bred by Mr. James Badgery, and all in calf to Mr. Badgery's bull, brought £140. "Raspberry," out of old "Daisy," dam of "Scott," with a young bull at foot and in calf to Mr. Blackland's Durham bull, £70; a two-year-old bull from the stock of the late Captain Kent (Devon), £50. The mixed bred cattle brought from £30 to £60 each.

In 1814 Messrs. W. H. Hovell, John Oxley, (Mrs.) Jenkins, Smith Bros., John Piper, John Dixon, Andrew Byrne, became noted cattle breeders, and Sir John Jamison arrived back from England with a consignment of Devon and Hereford cattle for his Regentville Estate.

CHAPTER III.

THE BIRTH OF ILLAWARRA.

The year 1816 brings us to the birth of Illawarra. The solitudes of this romantic and picturesque district had no sooner become familiar with the sound of the bushman's axe, the crosscut saw, and the swish and distinctive knock of the pit-saw and tiller from the lonely sawpit, together with the crack of the whips in the dexterous hands of Messrs. Throsby and Badgery's stockmen, than a new and more progressive system was adopted by the Government in establishing a cattle station at the "Five Islands." Great promises were discerned, even at that early date, in the abundant and succulent pasturage of this open country. Space compels us to refrain from details of Illawarra beginnings, and to be content with the grouping of leading events till 1828, a point at which Australia was claiming the attention of enterprising men throughout Great Britain and Ireland. If he who causes two blades of grass to grow where but one grew before is a benefactor to his kind, what shall be said of the early Illawarra settlers who cut a path through the bush with axes and brush-hooks, and cleared spots on which to erect shelter houses of bark, cabbage-tree, and mud, and afterwards caused grass and cattle to grow and increase where none grew or existed before.

In the year 1817 we are confronted with the sales of "land grants," as Mr. Simon Lord, one of Sydney's early auctioneers, sold a number of land grants, together with several herds of cattle numbering from five to twenty head. The following gentlemen were mentioned as being interested in cattle stations in the counties of Cumberland, Camden, and Argyle:—Messrs. Brooks, Browne, Badgery, Allan, Jenkins, Hughes and Hoskins, Johnston, Horsley, and Throsby. At this period most of these gentlemen were interested in business in both Parramatta and Sydney.

In 1818, 1819, 1820 the whole of the coast from Port Hacking to Jervis Bay, on the South Coast, was being settled by a class of settlers known as sawyers and timber getters, who were as a rule in the employ of the Sydney merchants who were in search of cedar. These men were often joined in their bush seclusion by convicts escaping from their misery, and sailors from the coastal whaling stations, which in those days were very plentiful.

In 1821-22 Mr. Commissioner Bigge was in Sydney investigating matters connected with the working of the new settlement. He afterwards issued three reports, which were published by order of the House of Commons, England. At this period the Government had three farms to provide food for cattle: No. 1, Grose Farm, containing 280 acres, situated on the Parramatta-road (now University Grounds); No. 2, Longbottom Farm, containing 700 acres, situated on Parramatta-road, at a distance of ten miles from Sydney; No. 3, Emu Plains Farm, situated on Nepean River, containing 269 acres. Mr. J. T. Campbell was in charge of No. 1 farm, Major Druiitt had charge of No. 2 farm, whilst Mr. Fitzgerald had charge of No. 3 farm. According to Commissioner Bigge's report, dated 1822, Mr. Samuel Terry owned 19,000 acres of land, 1450 head of cattle, and 3800 sheep. Messrs. D'Arcy Wentworth and Captain John Macarthur were considered to be equally wealthy in land and stock, the gatherings of but a very few years.

The early twenties bring us to the dawn of our coastal dairying—the clearing of brush and grass growing. With the grass and the

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

dairy cattle came prosperity to the settlers, and as years rolled on the highways and byways that were for many years before mere cedar crossings were bridged over with logs and sawn planks. It was only from the stories told by the mothers or grandmothers of the present generation that the real truths of the pioneering days could be obtained. Their husbands, or brothers, or fathers, as the case might be, were as a rule away in the bush working whilst the mothers and daughters were looking after the little home, and attending a few cows, poultry, and other live stock of the little bush farm. While this was being done the rich settlers had large or small gangs—according to circumstances—of convict and emigrant servants employed clearing and improving their holdings, which they had obtained either free from the Crown or for a few articles that at that time were considered current coin in New South Wales by way of barter, from some poor unfortunate who had lost heart over some family trouble. It goes without saying that many large holdings were put together in this way. Yet in the midst of all the strugglings of the poorer classes and all the graspings of the rich ones, there was much genuine friendship and very little crime. In the midst of all those wild days mothers thought nothing of walking with a child in arms to and from Kiama, Jamberoo, or Shellharbor, or from either of these three places to either Shoalhaven or Wollongong to see and comfort a sick friend, and they in turn received visits from their lady friends from those localities over twenty miles distant. Those mothers who could afford a horse constantly carried a baby and sundries in front of them, and rode from Kiama to Sydney. From Shoalhaven and Kangaroo Valley over the bush tracks to and from Wollongong on horseback was quite common. The monotony of these journeys was broken by the thousands of birds that were to be seen by day, and the various kinds of marsupials that kept constantly moving by night. Human beings, however, were practically safe from injury whilst travelling by day or night. The smaller settlers welcomed the stranger, and shared the best they had with him; the rich, on the other hand, passed him round to their kitchen and saw him no more. But the poorest were rich in those days, because they had plenty and were contented.

1820-23.—In the January of 1820 Mr. George Johnston, the eldest son of George Johnston, Esq., of Annandale, Sydney, paid a visit to Illawarra, where his father had received some very valuable grants of land. It was Mr. George Johnston's intention—he being at the time in an important and responsible situation—namely, Superintendent of Government Stock—to settle in Illawarra and turn his attention to breeding purebred cattle and horses, but he was unfortunately thrown from his horse and killed a few weeks after his visit to Illawarra, at the age of 31 years. His father, George Johnston, Esq., formerly Lieutenant-Colonel in the 102nd Regiment, and Acting Ruler of this colony for some months in 1808, during the memorable suspension of Governor Bligh's authority, died at his seat at Annandale January 5th, 1823.

About the year 1823 many settlers were establishing good homes in and around the Liverpool district, and as Illawarra was adjacent thereto a number of these well-to-do settlers obtained grants of land from the Crown in Illawarra, and by means of the packhorse (an animal which greatly assisted the early settlers to pioneer every nook and corner of this country) they commenced settling on the fertile lands of one of the most beautiful districts in Australia. The pack-horses and the dairy cows grazed side by side in Illawarra. The cow produced the wealth and the horse packed it to market, out of difficult gullies, over flooded creeks, through dense timber, and over rocky ranges for years and years before a wheeled conveyance could be brought into the greater part of this country. About Dapto Forest, in Illawarra, many small grants of land were made of from fifty to one hundred acres each. Then came the larger and more important grants which were carefully surveyed into convenient areas. Each of the larger settlers, who were anxious to improve their holdings,

THE BIRTH OF ILLAWARRA.

received servants from the penal settlement at Wollongong (which was established for the purpose), and so much provisions and clothing for each man thus obtained. By this means the timber was felled and burnt off, and chock-and-log fences created for the protection of the grass and crops that were being sown. There were some few turned their attention to fruit growing, but wheat growing and dairying was the rule.

1821.—In 1821 the first Agricultural Society of New South Wales was established: President, Sir John Jamison; vice-presidents, Rev. Parson Marsden, William Cox, Esq., and Dr. Townson, LL.D.; joint secretaries, Messrs. G. T. Palmer and Alexander Berry; joint treasurers, Messrs. Riley and Walker; annual subscription, £5 5s. each. A subscription fund of £25 each was also started with a view of introducing from the mother country more important breeds of cattle, horses, sheep, &c. An important auction sale of 100 head of cows and calves and heifers took place at Surry Hills, Sydney, the property of a Mrs. Hall. The young cattle were the progeny of a bull sired by Captain Kent's imported bull, and out of an imported cow owned by Mr. Palmer.

1823.—The prizes are published in connection with the New South Wales Agricultural Society, and are as follows:—For best colonial bull, first prize plate valued 40 dollars, second prize ditto 20 dollars; to be not more than three years old. For the best colonial bred heifer, two years old, first prize a piece of plate valued 20 dollars. There were, in all, thirteen prizes for stock, including cattle, horses, and sheep. A prize was also offered for the best servant. A general muster of the stock at the five Government cattle stations then in the colony was announced by order of the Governor to take place on same day. Mr. Robert Cooper imported a purebred Derbyshire bull and cow, and Mr. Macarthur a Hampshire bull and four Leicestershire cows of superior quality. Mr. Charles Throsby opened the Sydney abattoirs by forwarding ten fat bullocks to be slaughtered. They were of the Longhorned Durham breed, and when dressed weighed 100lb. each. Mr. Archibald Bell, jun., discovered the first route overland to the Hunter River Valley, and drove the first cattle overland to that country. A meeting of the proprietors of the Agricultural Society of New South Wales' stock funds is announced to arrange for the appropriation of the stock imported from England, Mr. E. Wollstonecraft secretary.

The following is a list of the subscribers to the stock fund of 1823:—

James Atkinson, Esq. . . . .	.. £25	Thomas McVitie, Esq. . . . .	.. £25
Alexander Berry, Esq. . . . .	.. 50	Rev. Samuel Marsden . . . . .	.. 25
John Blaxland, Esq. . . . .	.. 25	William H. Moore, Esq. . . . .	.. 25
Richard Brooks, Esq. . . . .	.. 25	James Norton, Esq. . . . .	.. 25
John T. Campbell, Esq. . . . .	.. 25	Nathaniel Norton, Esq. . . . .	.. 25
James Chandler, Esq. . . . .	.. 25	John Oxley, Esq. . . . .	.. 25
William Cox, Esq. . . . .	.. 25	John Palmer, Esq. . . . .	.. 25
William Cox, jun., Esq. . . . .	.. 25	George T. Palmer, Esq. . . . .	.. 25
Robert Crawford, Esq. . . . .	.. 25	John Piper, Esq. . . . .	.. 25
Prosper De Mestre, Esq. . . . .	.. 25	Edward Riley, Esq. . . . .	.. 25
John Dixon, Esq. . . . .	.. 25	Charles Throsby, Esq. . . . .	.. 25
Major Goulburn . . . . .	.. 100	Dr. Robert Townson, LL.D.	25
William Howe . . . . .	.. 25	William Walker, Esq. . . . .	.. 50
Sir John Jamison . . . . .	.. 100	Thomas Walker, Esq. . . . .	.. 25
Captain King, R.N. . . . .	.. 25	D'Arcy Wentworth, Esq. . . . .	.. 25
William Lawson, Esq. . . . .	.. 25	Major West . . . . .	.. 25
Robert Lowe, Esq. . . . .	.. 25	Edward Wolstonecraft, Esq.	50
Hannibal Macarthur, Esq. . . . .	.. 25		

ALLAN CUNNINGHAM, Esq., Corresponding Secretary.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

1823.—In 1823 Captain Currie, R.N., discovered the plains of Monaro, variously spelt Maneroo, Menaroo, and Moneroo. It was originally named the Brisbane Downs by Captain Currie, but finally received the name given it by the natives—Moneroo.

1824.—The Australian Stock Importation Company's ship Greenock arrived in Sydney with a valuable cargo and a consignment of four-year-old cows and two-year-old bulls of the pure Ayrshire milk breed, Mr. Alexander Warren in charge of the stock. This company was established with a capital of £100,000 in connection with the New South Wales Agricultural Society. They owned two ships, the Greenock, Captain Richmond (for New South Wales), and the Triton, Captain Crear (for Tasmania). Their respective tonnage was 442 and 404 tons—to be engaged in conveying passengers, goods, and stock between Leith and Australia, Mr. Robert Brown manager at Leith.

Imported into this colony by Captain Watson, a fine bull and cow of the Normanby breed. This bull and cow were the means of laying the foundation of Mr. Alexander Macleay's herd, afterwards established at Brownlow Hill, Camden. The Australian Agricultural Company having been formed in England with a capital of £1,000,000, and having received a grant of 1,000,000 acres of land at Port Stephens, had just appointed the following representatives as a committee to represent the company in New South Wales:—Rev. Archdeacon Scott, Captain P. P. King, R.N., Messrs. James Macarthur, Hannibal Macarthur, Dr. Brownson, Lord Bathurst. The instructions to Mr. Commissioner Bigge was that in issuing future land grants better regulations should be adopted to protect the settlers by encouraging, rather than compelling, them to work the land by giving it them at a quit rental.

1825.—In 1825 there were landed in the colony the thoroughbred stallion "Steeltrap." Steeltrap is represented as being a dark-brown chestnut, 16 hands high. Also four bulls and seven cows from Scotland. The sale of the cattle imported in the Greenock is reported as follows:—One heifer to J. T. Campbell for £25, one heifer to same buyer £41, one heifer to same buyer £53, one heifer to John Dickson £36, one heifer to John Dickson £48, one heifer to J. T. Campbell for £63, one heifer to D'Arcy Wentworth £50, one heifer to John Dickson for £53, one bull to Sir John Jamison £85, one bull to Mr. John Dickson for £107. The Australian Agricultural Company's ship The Brothers arrived at Port Stephens with a large shipment of stud horned cattle. In this and subsequent shipments of stock by this company were many of the best Durham and Argyleshire breeds. The company, however, made a great blunder in appointing agents in the colony to purchase stock for the estate. In consequence a large number of crossbred buffaloes were selected in the colony at high prices, and sent up to Port Stephens. In a few years afterwards an inquiry was instituted, and some of the New South Wales directors were censured. It is not necessary to give names under the circumstances.

1825.—Mr. Andrew Allan, of Sydney, established a cattle station at the Five Islands, and appointed Connor Woolaghan as overseer. The ship William Shand landed three Durham heifers and one bull, and five Devonshire heifers and one bull in Sydney. A four-year-old cow with a four months' old calf of the Yorkshire Shorthorn breed is being offered for sale in Sydney. The auctioneer, Mr. Atkinson, states—This cow was carefully selected in England from a herd of 800 milk cows belonging to Mr. Rhodes. This cow has given such an abundance of milk during the voyage as to make her a valuable acquisition for dairy purposes, and a like opportunity of landholders supplying themselves with two such fine choice animals of this truly valuable breed may not soon occur. The McIntyre family (twenty-seven in number) landed in the colony to take charge of the Honor-

THE BIRTH OF ILLAWARRA.

able Potter Macqueen's estate of 20,000 acres (Segenhoe), near Singleton. The Berkley Estate (Illawarra) had been in charge of a Mr. John Robinson, who had been dairying there for some few years with successful results. The Agricultural and Stock Society received on behalf of Mr. Bunton a consignment of two bulls and eight heifers per ship William Shand.

1826.—In his account of Captain John Macarthur's estate at Camden, Dr. P. Cunningham, R.N., says—"Neither has the breed of horses and cattle passed unnoticed by Mr. Macarthur. His cattle, partaking much of the Lancashire Longhorns, being mostly with dark-red or red-brindled bodies, with large spreading, drooping horns, appear to answer the climate particularly well, fattening easy, and giving a large supply of milk.

In 1826 a Mr. Wylie had been engaged stock raising and dairying on the Dunlop Vale Estate, Illawarra, and had collected a magnificent herd of the best types of Ayrshire cattle. Mr. George Tate was at that time raising bullocks on the Spring Hill Estate, which he owned. It was then the T in heart brand was established. The A.A. Company received another consignment of very choice cattle, comprising breeds from Saxony, Scotland, and the South of Europe. G. W. Paul, a Sydney merchant, and Colonel Mote sent down cattle to their estates in Illawarra and commenced breeding operations. Captain Bishop had been for some time establishing a garrison at Battery Point, Illawarra, and forming a settlement with a view of supplying settlers with laborers, &c. Dr. Townson had an important sale of 1240 horned cattle. A Cattle Board is established for the protection of stock and to prevent cattle stealing, which was then prevalent. The Australian Company's imported stock were divided among the shareholders as follows—J. T. Campbell, one red Devon cow; J. T. Campbell, one piebald Durham cow; J. T. Campbell, one red Devon bull; John Dickson, one Devon cow; J. T. Campbell, one Durham cow; D'Arcy Wentworth, one Devon cow; John Dickson, one Devon cow; Sir John Jamison, one Durham bull; Sir John Jamison, one Durham cow; John Dickson, one Devon cow. The colonial executive of the A.A. Company form a settlement at Warra, on the Liverpool Plains. A severe drought is prevailing throughout New South Wales and Tasmania.

1827.—In 1827 a great financial crisis occurs in New South Wales, consequent on foolish and extravagant speculation in sheep and cattle. Much distress results, and many colonists are ruined. A writer, referring to those days, says:—"Ah! who shall tell of the old ghosts and old interests, old tales and histories from 1826 to 1852, locked up in those worn-out and hoary old Sydney bank ledgers, nearly every page being the nucleus of a vivid three-volume novel if the whole surroundings were but tracked and delineated. Dost think there are no ghosts in Sydney? Beware, it is not London. Has there been no time since 1788 for wrong to be done, for hearts to be broken, for mortgages to be foreclosed, fortunes to be made? Ruin here? Good luck there? Happiness and joy? Misery and despair? All told of indirectly in the ledger columns." "Scrooge and Marley" have lived in Sydney as well as in London.

The Government commenced selling off their stocks of cattle, comprising many hundred head, at each of the five cattle stations, owing to the large stocks held by the bond and free and colonial settlers. One thousand head of cattle were disposed of at Emu Plains cattle station. According to Mr. James Atkinson, "these cattle were derived from various countries—England, Cape of Good Hope, India, Madagascar, and other places—and were bred with little discrimination, and were a mixed lot. Some few breeders, however, paid more attention, and possessed good herds—the best cattle being found among the smaller settlers." He mentions Rev. S. Marsden, John Macarthur, H. Macarthur, Sir John Jamison, J. Dickson, J. T. Campbell, and William Cox among the most careful breeders of that period. These were,

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

however, beginning to devote more attention to beef raising, whereas those breeders who were settling in Illawarra and the South-western tableland districts still adhered to the milk breeds. To those men his advice was to continue with the South Wales and Yorkshire (Holder-ness) Shorthorns and Longhorns for crossing on the colonial cattle. Heifers were being purchased in Illawarra at £3 to £4 per head for the A.A. Company's station at Port Stephens. At this point Macarthur grants amounted to 30,000 acres. Mr. H. Macarthur had decided to establish a small Devon herd as an experiment.

1828.—The first model farm established in New South Wales was owned by Captain (afterwards Admiral) King, and known as "Dunhaved." Captain King was the father of P. Gidley King, M.L.C. The manager of the estate was a Mr. William Hayes, who for a term of years managed it successfully, and was superseded by an Irish agriculturist named Flanagan, who raised not only a large and valuable stud of horses, dairy cattle, and sheep, but a large family of sons and daughters. Lady King arrived in 1829 with her six sons, the seventh being with the captain, assisting him in exploring the coast of Australia. Under the management of Flanagan the farm became celebrated and a pattern to be imitated by the other colonists. The sires used in raising horses were Lawson's Steeltrap, Lane's Hector, Sir John Jamison's Camerton. Hector and another horse, not named, were kept on the estate. The cattle used were imported Shorthorns, Ayrshires, and Guernseys. At this period—1828 to 1836—within a radius of twenty miles of the county of Cumberland there were at least thirty big estates, most of them well managed, employing from 100 to 150 prisoners each, besides managers and overseers. Strange as it may seem, where all these men once resided in affluence, there is scarcely a stone left upon another to mark the scenes of their former possessions; and most of their descendants have disappeared; names once so familiar are now almost obliterated from memory. The good work, however, of the King family was not lost, as many of those men, and women, too, who had to spend a few years of their lives in compulsory employment, learned lessons in farming and dairying which were not only useful to them, but their neighbours, when they got an opportunity of settling down for themselves in other districts. The Illawarra and Shoalhaven Valley districts benefited by not a few such settlers.

1829.—Drs. Alexander and John Osborne and Mr. Henry Osborne came to reside in Illawarra, having received grants of land each. Mr. John Wylie's Ayrshire herd are reported to be adapting themselves admirably to the climatic conditions of Illawarra. His estate comprised 4000 acres. The first sale of Alderney and Jersey cattle is reported from Windsor, when Mr. G. T. Palmer's herd, comprising 200 head, were sold at satisfactory prices. These cattle are said to have laid the foundation of Howe's (Glenlee) and other dairy herds. A two-year-old imported Durham bull was sold by auction in Sydney at £80. In this year an important proclamation is issued proclaiming Five Islands, Kiama, Gerringong, Shoalhaven, Coolangatta, and Ulladulla townships. The Brooks Bros., A. B. Spark, Hughes & Hoskins, and others sent large numbers of stock to the South Coast. The increase of horned cattle in New South Wales is stated to be considerable, being at the rate of 30,000 head per year. At present the estimated number of horned cattle in the colony is over 600,000 head. Speaking of the drought that was being experienced, a gentleman said:—"New South Wales must expect these visitations occasionally; she must expect depressions; they are portion of every territory beneath the sun; but she will triumphantly surmount them all and become the queen of the half of the southern hemisphere." Mr. Alexander Berry resigns from the secretaryship of the New South Wales Agricultural Society, and Mr. A. B. Spark is appointed. In the doings of the Agricultural Society published in 1829 an article is published on the increase of the dairying industry in the colony owing

THE BIRTH OF ILLAWARRA.



HENRY OSBORNE, Esq.
Born Co. Tyrone, Ire. 1803.
Died Illawarra, N.S.W. 1859.



CHARLES THROSBY, Esq.
Born Leicester, Eng. 1800.
Died Bong Bong, N.S.W. 1854.



HENRY BADGERY, Esq.
Born South Creek N.S.W. 1803.
Died Bong Bong, N.S.W. 1881.



WILLIAM WARREN JENKINS
Born Eagle Vale, N.S.W. 1815.
Died Illawarra N.S.W. 1884.



CHARLES McALISTER, Esq.
Born Edinburgh, Scotland 1828.
Died Goulburn, N.S.W. 1908.



JAMES ROBB Esq.
Born Perthshire, Scor. 1805.
Died Kiama N.S.W. 1881.

SOME OF THE EARLY PIONEERS.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

to the surrounding districts of the Hunter River, Port Macquarie, Bathurst, and Wellington coming into composition with counties of Camden, Cumberland, and Argyle. The same writer states :—"The character and quality of our herds are acquiring increased usefulness and value through the use of imported highly improved English, Scotch, and Irish bulls and their male descendants, and that every owner of cattle will find an interest in breeding from the best male stock from the herd of Sir John Jamison." Mr. John Horsley, who was on the committee of the association, sent some of Sir John's breed of cattle to his estate at Illawarra, as did also Mr. David Johnston. Mr. Charles Throsby's herd at Bong Bong was recognised the best on the tableland. It is stated that the Holderness and Longhorns, characterised by their white backs, bellies, and faces, were very much admired in those days by the smaller settlers. The whole of the South Coast was suffering more or less from the continued drought, which had practically continued from 1826, and bush fires were raging on the mountains and range sides. As Carlyle says :—"Do not fires, fevers, sown seeds, chemical mixtures, men, events, all embodiments of 'force' that work in this miraculous complex of 'forces,' named universe, go on growing through their natural phases and developments, each according to its kind; reach their height, reach their visible decline; finally sink under, vanishing, and what we call die? They all grow; there is nothing but what grows, and shoots forth into its special expansion, once give it leave to spring. Observe, too, that each grows with a rapidity proportioned in general to the energy or unhealthiness there is in it. Slow, regular growth, though this end in death, is what we name healthy energy."

A mob of cattle was selected in the Illawarra district by the Government authorities in Queensland for the use of the settlement. These were the first cattle introduced into that country, and were depastured at Red Bank Plains, in the vicinity of "Limestone" (now Ipswich). They were in charge of a constable named Thorne. Several of these animals got away from their keepers, and travelled back to their native haunts in Illawarra. (See Stuart Russell's "Genesis of Queensland")

CHAPTER IV.

STRUGGLES OF THE EARLY SETTLERS.

1830.—In or about 1830 there were many developments in connection with the settlement of the counties of Argyle, Murray, St. Vincent, Dampier, and Auckland. Messrs. Charles Throsby, Henry Badgery, and a few other settlers held almost the uninterrupted grazing right of the whole of the open country south and west of Jervis Bay. Those who were spying out the land seldom journeyed further south than Moruya in the late twenties. But the late drought of 1827-28-29 created a great rush for those rich lands south of Moruya, and those lands at the head of the Shoalhaven River and its tributaries which were unoccupied by Messrs. Berry and Wollonstonecroft. The larger stockowners had hitherto been content with their holdings in Cumberland and Camden. Whilst vegetable life is resting during a drought, animal life must be removed where they can hustle for a living. Hence we find the greedy and the needy all on the move for pastures new.

Among those who moved towards the low-lying valleys were Messrs. James Osborne, Brooks Bros., Leslie Duguid, and A. B. Spark. James Osborne was at Bong Bong, Brooks Bros. were at Denham Court, Liverpool, Leslie Duguid, Commercial Bank, Sydney, and A. B. Sparks owned Tempe, Cook's River. They jointly and severally took up the Kangaroo Valley. Mr. George Macleay, of Brownlow Hill, Camden, took up Croobar, Ulladulla. Mr. John Hawden took up Kiora, Bodalla, and Bergalia, in the Moruya district. He had previously lived at Elderslie, Campbelltown. Mr. Abraham Polack, one of Sydney's auctioneers, took up Brogo; Mr. James Foster, of Bong Bong, took up Narooma, on the Wogonga River; Mr. George Curlew took up Krarwarres. The Byrnes, of Cadgee, had a great scope of country; whilst the Imlay Bros., Drs. George and Alexander, R.N., and Mr. Peter Imlay owned the greater part of the country south to Twofold Bay.

Although the above names only are mentioned, it is not to be understood that they comprise anything like the number of men's names that could be associated with the development of New South Wales, which could be attributed to the search for grass for stock in droughty times from the very dawn of its history. Even at the very period under review there were other settlers trying after the most fancied spots with a view of building up smaller squattages, often in the centre of the bigger holdings. This latter system would, of course, largely depend on the amount of influence the smaller men had with the Government officials.

Mr. J. T. Campbell was a spirited buyer of cattle in those early thirties. He was an admirer of the Durham, and kept a first-class collection of stud animals. But it would appear that a very large percentage of the cattle raised in those parts were crossbred Long-horns; the brindled and strawberry ballies, with their long corkscrew horns, were to be found in abundance on every station. Messrs. William Campbell and John Hawden's cattle were, however, well supplied with the imported bulls (the best obtainable), as both kept stud herds near their homesteads, and as time went on smaller settlers who came and squatted in the locality possessed themselves of the breed very cheaply, and raised excellent stock on their own account. Among these settlers might be mentioned the names of O'Keefe, Rae, Flanagan, and Charles Campbell.

There were several whaling stations on the sea coast in the vicinity of the Moruya River, which goes to show that a considerable amount

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

of trade was being done in wool, horns, hides, and tallow.

In these years—1830-35—the cattlemen had what was called heifer stations. These heifer stations were, generally speaking, isolated gullies with but one inlet, which was also the only outlet. The heifers would be placed in there in charge of a stockman and hut man. The bulls were kept in secure paddocks, and therefore the heifers would not be allowed near the bull until about three years old. When they calved they were large, full-framed animals, with plenty of constitution.

To give an idea of the class of cattle used hundreds of miles from Sydney:—In 1831 Dr. Dobie imported a few cattle from England, including a very fine Shorthorn bull (Spencer, 8623, C.H.B.). Spencer was bred by Lord Althrop, and was by "Mercury" (2301, C.H.B.), dam by Dandy (951, C.H.B.), g.d. by Cecil (120, C.H.B.), gr.g.d. by Midas (435, C.H.B.), by Meteor (431, C.H.B.), by Petrarch (488, C.H.B.), by Alexander (20, C.H.B.), by Traveller (655, C.H.B.), by Son of Bo!ngbroke (86, C.H.B.). This bull died 1840, and was merely one of many such animals imported to New South Wales for service on cattle stations, with the object of improving the existing herds of cattle throughout the colony. Spencer's progeny were afterwards used by Mr. W. R. Jenkins, of Berkeley, Illawarra.

1832.—When Governor Bourke arrived in Australia it was the custom of all Governors to give free grants of land at a quit rent to all deserving settlers. Unfortunately no sensible provision had been made to prevent the dissipation of these grants by their temporary holders. It would appear that none but rich men or men of daring enterprise, combined with genius, could afford to hold on to those early grants. This is shown by the large number of transfers issued by the Colonial Secretary's Office and the extensive sales of stock following in the line of depression that this country passed through up to the discovery of gold in the fifties. During 1832 it was an ominous fact that the conversion of the smaller grants into large holdings and the large holdings into wide domains has kept the progress of the country back and is still retarding its progress.

In the early thirties the produce of the settlers around Wollongong was taken to Sydney for sale in "sloops." The producers used to go to Sydney with their own produce and sell it on the wharf, then purchase with the proceeds the stores and provisions required for their own use, and return in the "sloop" to Wollongong. This practice was almost general throughout the district, until a Mr. Meiklejohn, who had a small farm in the district, undertook to do all the selling of produce and marketing for his neighbours. This may be termed the commencement of the commission agency business as regards the South Coast district.

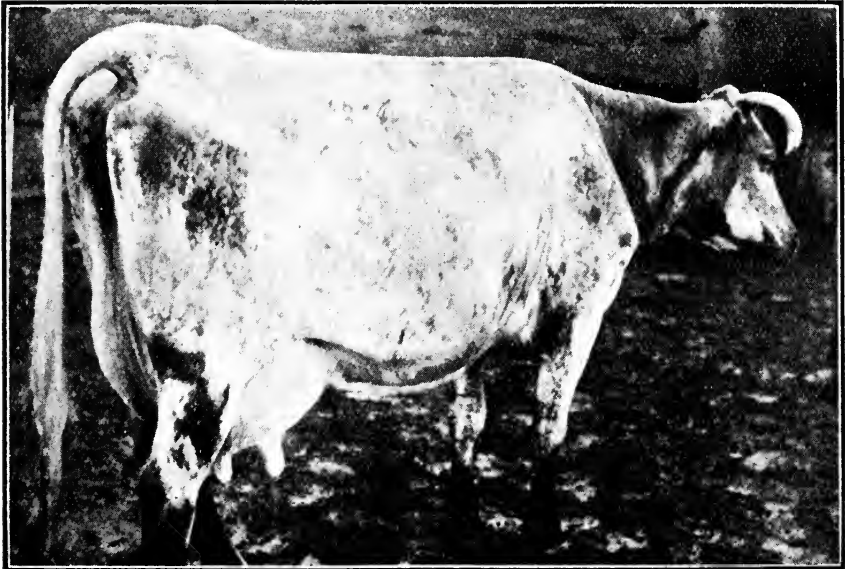
There was a great newspaper war raging among the Press of New South Wales in the early thirties, and one cannot help referring to one writer, who stated as follows:—"Where land is a luxury the luxurious find its enjoyment heightened by solitude. 'Woe,' cried the ancient prophet, 'to them that lay field to field till there be no place that they may be placed alone in the midst of the earth.'" The sequel of the land grant system of New South Wales goes to prove that that quotation was prophetic.

1832.—Capital combined with industry and enterprise. The favoured few of those days, who knew where to tap the golden stream, not only received a maximum of profit with a minimum of toil and anxiety, but they lived in an age when money could procure for themselves an enjoyment of life far longer, far more various, and far more refined than was possible before in this country. But, unfortunately, there is another side to the picture. For during those 50 years that had such an uncommonly happy time for the rich it is impossible to say so much for the poor struggling settlers.

STRUGGLES OF THE EARLY SETTLERS.



An Australian Stockman of the Early Days.



A Typical Illawarra Dairy Cow. Bred by Mr. Hugh Dudgeon, Hillview, Jamberoo. The property of Mr. David Weir, Clunes, Richmond River.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

1834.—In 1834 Mr. John Dickson sold a large number of stock, amounting to 600 head, including 20 purebred Devon bulls and 50 Devon heifers; the remainder were milk cows of various breeds. Captain Waldron, an important settler, was murdered on his Spring Hill property, Wollongong, on January 28th of this year. The tragedy created a great sensation in the young settlement. Captain Westmacott, who was A.D.C. to Governor Bourke, took up land at Bulli, and established a small dairy herd and a small stud of choice blood horses thereon.

In 1834 the residents of Illawarra, including C. O'Brien, George, Brown, William Gart, Thomas Coapley, William Thomas, C. T. Smith, and others, signed a petition to be presented to the Governor with a view of arriving at a system by which better roads could be obtained to give ingress and egress to their beautiful and fertile district, and thus give the settlers better facilities to the Sydney markets. The Governor, in reply, promised to visit Illawarra. The Governor afterwards visited Illawarra, and after duly considering the various tracks suggested by Messrs. Spearing, O'Brien, and Rixon, sent Major Mitchell to draw a chart of the best route. This was accordingly done, and Lieutenant Otway and a gang of convict men were sent down to make the road from Wollongong to Appin. Henry Osborne, Dr. John Osborne (Wollongong), Michael Hindmarsh (Gerringong), Dr. Alexander Imley (Dapto), George Brown (Dapto) applied to the Bench of Magistrates (Wollongong), consisting of Police Magistrate W. N. Grey and C. O'Brien J.P., for a number of servants from the Crown. The annual meeting of the A.A. Company was held, and ten of the company's young bulls were offered for sale. The company had then 3000 horned cattle on their estate. The cattle in the Illawarra district were showing a marked improvement in both color and type. During the calving season the dairies were showing a busy appearance. Dr. Lang at this time was endeavouring to induce Scotch settlers to settle in Illawarra. Apparently, taking advantage of Dr. Lang's special efforts in this direction, a Mr. Chadley, auctioneer, of Sydney, advertised fourteen farms from 90 to 100 acres each, each commanding a frontage to the Minnamurra River. He describes the land as being covered with cedar and hardwood of every description. The auctioneer also stated that an estate of 20,000 acres was adjacent to this land, and that at Kiama there was a harbor and sheds erected to receive all forms of produce. George Brown had the contract for erecting a courthouse and gaol at the new town of Wollongong. The town had previously been established in the vicinity of Port Kembla—called Red Point.

In 1836 Mr. Riley sold his estate near Jervis Bay, comprising 2560 acres, including 250 head of cattle. Seventy of the animals were milk cows specially selected for the dairy from Mr. William Cox's herd of dairy cattle. At this time there was a small settlement at Hoskisson, on the shores of Jervis Bay, which rapidly grew into importance. Large vessels used to call there for wool, tallow, hides, &c. Cattle were also shipped at both Jervis Bay and Twofold for New Zealand, Port Phillip, and the Swan Bay settlements. The greater portion of the stock for Port Phillip, however, went overland from the stations on the Lachlan and Murrumbidgee Rivers. Mr. George Macleay sold at Parramatta 100 head of choice dairy cows in calf to imported Durham bulls. Mr. George Brown, of Dapto, established salt pans for the manufacture of salt at Gooseberry Island, Lake Illawarra.

1836-37.—In 1836 Mr. William Lee, of Bathurst, imported a purebred Shorthorn bull named "Julian," bred by the Rev. Henry Barry. "Julian" is described as a roan bull got by "Maggot" (2238). In the following year (1837) Mr. William Lee, of Bathurst, imported a pure Shorthorn bull, Petrarch, and his dam. Petrarch is described as being red with roan hair; got by Colossus (1847), by Ambo (1636), dam Beauty, by Imperial (2151), g.d. Beauty by Favourite (1030). &c. This

STRUGGLES OF THE EARLY SETTLERS.

bull's pedigree goes back to Charge's grey bull (872) and Browne's white bull (98). In 1840 the same breeder imported two more bulls, the pedigrees of which are lost—both unnamed.

Re Petrarch: This great bull went back in line of descent to Charge's grey bull and Browne's white bull, both of which bulls laid the foundations of many of the most important tribes of Shorthorns in England. Petrarch became a famous sire in New South Wales under the guidance of Mr. William Lee, who is said to have been the best breeder of station Shorthorns of his day in Australia. He was followed by Mr. Thomas Lee, of Woodlands, Bathurst, who became a celebrated breeder in the late fifties and early sixties.

1837.—Messrs. Hawdon, of Howlong, on the Murray River, drive cattle overland to Melbourne, thus opening up the overland cattle trade. A fortnightly mail is established between Sydney and Melbourne, carried by John Bourke, Mr. Hawdon's stockman. Before leaving the colony Governor Sir Richard Bourke sold out his valuable herd of dairy cattle, which he had carefully collected during his stay in the colony. This herd was from stock bred by the Rev. Samuel Marsden—Suffolk dun polled—and were represented by the auctioneer as excellent milkers. Mr. William Warren Jenkins commenced cattle raising on an extensive scale on the Berkeley Estate, Illawarra, being materially assisted by his father-in-law, Mr. James Wilshire, in the selection of suitable animals for the farm, among which were some valuable dairy cattle. Mr. Armstrong, a veterinary surgeon, who had a horse and cattle bazaar in Sydney, had a large number of both horses and cattle grazing in Illawarra. Some of the horses were very valuable, he having imported them in conjunction with John Berry, of Shoalhaven, in the "Emerald Isle," a ship belonging to the East India Company's service.

An important sale of high-class cattle took place on the estate of Captain Ebor Bunker, Collingwood, Liverpool. Seven hundred head of horned cattle were disposed of in two days. There were several large buyers from Illawarra, among them being Mr. William Wilson, of Fairy Meadow. Mr. T. W. Smart had for sale in Sydney thirty Durham milk cows bred by Mr. Riley on his estate at Jervis Bay. The Toryburn Estate, comprising 4000 acres on Liverpool Plains. Mr. Blaxland was the purchaser, who afterwards sold the stud herd of Durhams (milkers) in the Sydney market. John Tooth, merchant, Spring-street, Sydney, sold 674 head of cows, heifers, and bulls of the pure Durham breed in one lot; and 588 head of cows, heifers, and bulls of the pure Durham and Ayrshire breeds in another lot by auction. These cattle were all bred on his estate, Camden.

The merchants and other business firms in Sydney were doing enormous deals in horned cattle during this period of our history. Richard Jones, merchant, Hunter-street, Sydney, sold 550 head of breeding and milking cows and heifers, also twelve superior purebred Durham bulls, among which was the celebrated imported bull "Roger." A number of the cows were reported to be in calf to Mr. T. Iceley's famous bull "Rodney." This bull was imported by Mr. Iceley from England.

Applications were made by a large number of squatters in New South Wales for leave to go outside the present boundaries defined by the Government to take up stations. These applications were dated 16th July 1837. About this time Messrs. John Terry Hughes, John Eales, Peter McIntyre, and George Porter were at law with the Government over the extension of their vast landed estates in the colony. At this time there was 800 acres of land situated in the Kangaroo Ground in the market for sale at 5s. per acre. There was also the announcement of the sale of Mr. John Dickson's celebrated herd of purebred Devon cattle. Mr. Dickson had died and left Alexander Berry, M.C., his sole executor. Dickson owned a flour mill in Sussex-

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

street, Sydney, and also a breeding farm near Camden called Nonorah. He kept a special herd of Shorthorns and Longhorns, which were purchased by Mr. Berry for his Jindyandy dairy at Shoalhaven. Mr. Thomas Reddall was doing business with a Mr. George Watson in dairying lines at Lake Illawarra. Their cattle were of the Holderness and Longhorned breeds, many of them having white back, belly, and face, with black sides. The whole of the land around Lake Conjola, Ulladullo, was sold by the Government. Mr. George Macleay sold at Parramatta 100 head of dairy cows in calf to the purest Normanby bull in the colony.

At this time the Segenhoe Estate, near Singleton, were sending to Sydney some excellent cattle for sale annually. Thomas Potter McQueen, Esq., was the owner, and he had imported at great cost valuable Durham bulls and cows. These lots comprised: 1st Bravo, 2nd Barron, 3rd Musselman, 4th Tancred, 5th Mameluke, 6th Meteor, 7th Star, 8th Friar Tuck, 9th Ranger, 10th Casper, 11th Rosey, 12th Young Comet. Although a serious drought was threatening the colony, these bulls brought big prices, the chief buyers being South Coast and tableland station owners. Thomas U. Ryder had a valuable herd of Shorthorn cattle on his estate, Belltrees, Hunter River, the whole of which were sold during this year. Mr. Ryder had gone to great pains selecting stud stock. The dispersion of this herd gave many of the small breeders an opportunity of getting possession of the very choicest animals at very reasonable prices, especially as all the best animals were sent to Sydney market for sale in lots to suit purchasers. For example:—A. Polack, auctioneer, Sydney, has for sale at his bazaar thirteen purebred Devon and Durham bulls, just landed ex ship "Juliet"; also on account of Mr. T. U. Ryder, one pure Durham bull and three pure Durham heifers. These animals were imported by Mr. Ryder, and were of special merit according to the auctioneer's announcement.

1838.—At Mr. Thomas Potter McQueen's estate sale, held in Sydney January, 1838. The horses, cattle, and sheep realised the sum of £17,091 7s. 6d. The cattle realised as follows:—Bulls: "Rob Roy," John Terry Hughes, £21 10s.; "Jasper," George Boman, £12; "Ivanhoe," George Boman, £8; "Conqueror," J. Johnson, £13; "Knave of Clubs," George Porter, £20; "Forrester," J. McDonald, £17 10s.; "Morning Star," Geo. Townsend, £12; "Fergus," Geo. Townsend, £8; "Young Comet," A. Foss, £40; "Sweet William," A. B. Spark, £26; "Commodore," S. A. Bryant, £22; "Rainbow," J. Johnstone, £24; "Emperor," G. A. Bryant, £25; "Cerberes," P. Haydon, £22; "Orion," John Hale, £30. All these bulls were under 12 months, and of the lots sold those of John Terry Hughes, J. Johnson, and A. B. Spark came to Illawarra, and thence on to Monaro. There were also sold:—Bulls: "Mercury," 2 years, A. Fotheringham, £45; "Jupiter," 4 years, William Howe (Glenlee), £85; "Japhet," 4 years, J. Hale (Parramatta), £60; "Lottery," 6 years, J. Hale (Parramatta), £35. The cows were sold in ten lots of twenty each and ten lots of fifteen each, and were purchased by practically the same buyers as purchased the bulls, and averaged £10 per head.

The sale of Dr. Lang's estate near Mullet Creek, and adjoining the Illawarra Lake, is advertised in allotments as follows:—Four allotments of 12 acres each, five small farms from 35 to 60 acres each; four small farms from 25 to 30 acres each; Peninsula farm, containing 112 acres; Hook's farm, containing 60 acres; the Lake farms, containing as follows: 45, 45, 50, 35, 60, 60, 70, 50, and 50 acres each. Some of the farms were adjoining the properties of Messrs. Carvutha Bros. and Jenkins. Grant of land in January, 1838, to Mr. Charles Throsby Smith, Illawarra, commencing south-west corner of Brady's grant, containing 1280 acres, promised in 1831 by Sir Ralph Darling.

Mr. John Lawson purchased the following imported cattle at Polack's Bazaar, Sydney:—One imported bull, £100; one heifer,

STRUGGLES OF THE EARLY SETTLERS.

£45 ; one heifer and calf, £170 ; one heifer, £125; and one cow, £65. These cattle were represented as being of the best quality, and bred from the best Shorthorn herds in England.

Mr. Armstrong, veterinary surgeon, of Sydney, advertises for sale at his bazaar five Durham bulls, three Hereford bulls, one pure Ayrshire bull, also a bull and cow by Mr. George Hobler's imported bull "Jupiter." The Hereford bulls were bred by the Duke of Bedford, England, and are of superior quality.

Mr. Armstrong, V.S., kept a horse and cattle bazaar in Sydney for a number of years, and was largely interested in the importation of stock to the colony. He, in conjunction with shipping masters such as Towns and Addison, Prosper D'Mestre, John Lawson, A. B. Spark, and others who were interested in the whale fishery business on the South Coast, were all the time trading in cattle and horses in a small way. But larger sperm oil merchants and shipowners, such as Robert Campbell & Co., Richard Jones & Co., Aspinall & Brown, John Tooth, George Blaxland, Cooper & Levy, and William Walker & Co., who were largely interested not only in the whale fisheries on the coast, were also largely interested in cattle stations throughout the settled parts of the colony where boiling-down establishments were carried on. These establishments were the means of fixing a value on the stock raising in the colony by making all horned cattle worth the price of their hides and tallow.

CHAPTER V.

OPENING UP THE COLONY.

Sir George Gipps, who had succeeded Sir Richard Bourke as Governor of New South Wales, had been some months endeavouring to get into touch with the colonists and settlers generally, but in this he did not seem to be a success. Perhaps this arose from his conscious superiority over those with whom he had to transact public business, and a harshness of manner to which they had not been accustomed, especially as one great object of his government appears to have been, from the first, to get all the money he could out of the pockets of the people, and to transfer it as fast as possible to the public treasury. This "risking the life of the calf by not sparing the cow" policy was ever so strong in him that Dr. Lang says:—"His answer to anyone who reminded him of this would have been that 'he did not care five farthings for the calf provided the cow could only be made to give him her milk.'" It appears that Governor Bourke had fixed the selling price of ordinary land at 5s. per acre, and this had proved such a source of revenue to the colony that Lord Glenelg ordered Governor Gipps to raise it to 12s. per acre, adding: "If you should observe that the extension of the population still proceeds with a rapidity beyond what is desirable, and that the want of labor still continues to be seriously felt, you will take measures for checking the sale of land, even at 12s." Governor Gipps afterwards said: "I was sent here to carry out the Wakefield system, and whether it suits the colony or not, it must be done." Of Mr. Wakefield Dr. Lang speaks thus:—"Mr. Edward Gibbon Wakefield, a gentleman for whom I have the utmost respect, and who has laid the colonial world under the highest obligations for the invaluable services he has rendered to society in the cause of colonisation, proposes, in common with other colonial reformers, that the colonial Legislatures should have entire freedom and independence in all subordinate matters, or in other words what we call municipal independence, but that all Imperial questions should be left to the Imperial Parliament." Dr. Lang quoted Dr. Benjamin Franklin, who said:—"The birthright of every British subject is to have property of his own, in his estate, person, and reputation; subject only to laws enacted by his own concurrence, either in person or by his representatives; and which birthright accompanies him wheresoever he wanders or rests, so long as he is within the pale of the British Dominions, and is true to his allegiance"—in proof of the wisdom of adopting Governor Sir George Gipps' land reform scheme.

But the strictly political questions during Governor Gipps' administration were of far more importance than those relating to the land sales regulations. One of these was the legalisation of the squatters' runs, and the imposition, at the request of the squatters, of a small tax per head on all horses, cattle, and sheep to provide for the establishment and support of a border police for their protection. A second was the emigration question, in reference to which it was strongly urged that the Imperial Parliament had no right under Lord John Russell's Act for the regulations of the sale of waste lands in New South Wales to make it compulsory on New South Wales to devote one-half of the proceeds of its land sales to emigration purposes. A third, and more important one, was the sending out from England of what was called the Constitution Act, whereby a Legislature of one House was to be constituted, to consist of thirty-six members, of whom six were to be Government officers, six Crown nominees, and the remaining twenty-four to be elected by the people—namely,

OPENING UP THE COLONY.

eighteen for New South Wales proper and six for Port Phillip.

During 1838 a weekly market and a brewery were established in Wollongong, and were both doing a flourishing business. Mr. Francis Allman was Resident Police Magistrate, and Mr. H. A. B. Bennett clerk at the court house, Wollongong. By advertisement there was for sale at Wollongong 80 cows with calves at their side, 40 heifers 2 years old, 30 heifers 1 year old, and 3 fine bulls. These cattle were of the pure Durham breed, and were in charge of Mr. Thomas Wilson for Mr. A. B. Spark, merchant, Sydney.

In 1838 Mr. Abraham Polack, auctioneer, No. 2 Park-street, Sydney, sold on account of Mr. William Hill, butcher, George-street, Sydney, seven head of imported pedigreed cattle, including two bulls and two cows of the Durham breed, two bulls and one cow of the Herefordshire breed. These animals were described by the auctioneer as being true representatives of their respective breeds, and of high-class quality. Mr. W. C. Wentworth was the purchaser of the lot at the substantial figure £1243.

In 1839-40 there was a severe drought in the Illawarra district, and during this period a bridge was being in course of construction at Dapto. Floods, however, occurred in 1841, and the bridge had to be abandoned owing to the silting up of Mullet Creek. During 1842 Governor Sir George Gipps issued orders for the removal of the stockades from Mullet and Charcoal Creeks to Wollongong, and from thence to Sydney; therefore any works incomplete had to be carried out by local bodies, which had been appointed by the Government.

In 1839 there were quite a number of auctioneers in Sydney, many of whom had large places of business in the city. A few of them combined auctioneering with a dealing business, and either imported stock to the colony or purchased cattle brought out by captains of ships and others as a speculation. A large business was in consequence done with the settlers and others interested in the lands of the colony. This led to the formation of the Australian Auction Company, with a capital of £250,000. The objects of the company was to conduct sales of land and stock at usual rates, and import to the colony stock of the most improved breeds from abroad to suit the colony's requirements. Mr. Thomas Icely, of Coombing Park, near Carcoar, was at this time recognised as being possessed of some of the finest blood horses, sheep, and Durham cattle in New South Wales, and his cheese was recognised as being equal to the best English makes. He sent down drafts of horses and cattle, and dray loads of cheese to the Sydney market, which found a ready sale at a satisfactory price. On the 14th of May, 1839, the Illawarra Steam Packet Company was established, and the company purchased immediately afterwards the s.s. Maitland and sent her on her maiden trip to Wollongong in the June following, and was well patronised by the residents.

In 1839 Mr. John Brown, of Windsor, imported per ship Pemberton Grange for Mr. Robert Brown, of Parma, near Shoalhaven, a consignment of Durham cattle from the celebrated herd of Mr. Robert Jackson, of Berwick Hall, England. Dr. Alex. Osborne, of Wollongong, imported a few Durhams by the same ship.

At this time the county of Cumberland contained within its districts many excellent dairy herds. Representative animals were to be found of all the known breeds of dairy cattle in Europe, as well as the British Isles. From about the year 1828 the various fanciers were improving their herds. The Channel Isles gave the colony some valuable specimens of their stock; but it is difficult to separate the breeds as they came from those islands, as all the cattle coming from there were called 'the St. Hellier breed.' The Shorthorn, Longhorn, Holderness, Lincoln Red, Devon, Hereford, Ayrshire, and Kerry

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

were plentiful, as also the dun-colored Polled Suffolk. Argyleshire and the Frei-ians had their fanciers then as now, but in those days the types were different: the forms and coloring had not become so distinct as now, nor did the breeders conform so much to fashion as in latter years. Many of the large cattle owners kept a limited number of their stock pure for stud purposes: the remainder were allowed to commingle promiscuously together, leaving a genial climate and a rich pasture to bestow its blessing as best it could on the material yearly coming into existence under these neglected conditions. It would appear, however, that the stock thus exposed to Nature, and tainted, as many of them were, strongly with the Indian buffalo cross, grew up into beautiful animals, which gave much force to the old theory that "most of the breeding goes in at the mouth."

In 1840 Mr. Edward Hamilton, of Collaroy, Cassilis, imported a roan bull, unnamed, from which he bred a bull named No. 2. This bull was purchased by Mr. Clarke Irving, of Tomki, Richmond River, in 1846, and is said to have largely helped to lay the foundation of the celebrated Tomki Estate Shorthorn herd.

Owing to the great numbers of emigrants that were pouring into the colony, capitalists were induced to follow with a view of investing their capital. This influx of British capital, and Governor Gipps' drastic rule, which he had been ordered by the Home Government to enforce during his term of office in the colony, created a new order of things. The Government was in the habit of depositing large amounts, the proceeds of land sales in the different banks then existing in the colony at 4 per cent interest, but Governor Gipps insisted on having 7 and $7\frac{1}{2}$ per cent. Thus he obtained, and in order to pay this high rate of interest concurrently with transacting their ordinary business and meeting their usual liabilities, the banks had to enlarge their discounts and to take security for their advances, in doing which they crossed the line of safety. The rage of speculation soon seized the colony with even greater vehemence than during the sheep and cattle mania of Darling's time, the most unbounded extravagance of living was indulged in; nearly everybody bought land and live stock at enormous prices, till at last, the obligations to the banks and loan companies coming due, land and stock, costly equipage, and property of all kinds were forced upon a fallen market, and the inevitable crash came a few years later, when the Bank of Australia became involved in the ruin and fell.

Another of Sir George Gipps' reforms soon followed. He issued a proclamation establishing certain regulations, in which squatters were required, over and above their license fee and the assessment on stock, to make certain compulsory periodical purchases of land for the privilege of squatting. A great outcry followed. Meetings were held, inflammatory speeches were delivered, petitions were signed, and for the due protection of the pastoralists the Pastoral Association of New South Wales was formed.

We give the following specimens of advertising in 1840:—

The Australian Auction Company imported the following stock, which are for sale at the company's bazaar:—One purebred Durham cow, calved 1835, got by Scription out of Red Daisy (see Albert. (This was the calf of the cow mentioned above.) Mary Ann, a purebred Devon cow, with fine bull calf at her side; also, one superior large-framed Devon cow. (Mr. Dodds was agent for this company.

The Australian Auction Company are selling, on behalf of the Segenhoe Estate (Singleton), in Sydney, 71 purebred Durham cows; 60 purebred Durham heifers, 3 years old; 11 purebred Durham bulls, 2 years old; 13 purebred Durham heifers, 2 years

OPENING UP THE COLONY.



GEORGE GREY, Esq.
Born Co. Fermanagh, Ire. 1802.
Died Kiama, N.S.W. 1887.



JOHN COLLEY, Esq.
Born Co. Antrim, Ire. 1813.
Died Jamberoo, N.S.W. 1907.



NICHOLAS CRAIG, Esq.
Born Cornwell, Eng. 1815.
Died Jamberoo, N.S.W. 1907.



JOHN BLACK, Esq.
Born Co. Fermanagh, Ire. 1831.
Died Kiama N.S.W. 1881.



HENRY FREDRICKS, Esq.
Born Newcastle, N.S.W. 1829.
Died Kiama, N.S.W. 1900.



WILLIAM GREY, Esq.
Born Co. Fermanagh, Ire. 1832.
Residing Illawarra 68 Years.

ANOTHER GROUP OF PIONEERS.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

old ; 10 purebred Durham bulls, 1 year old ; 1 bull, 5 years old ; 1 bull, 3 years old ; and 3 yearling bulls of the pure Durham breed.

The Australian Auction Company have for sale in Sydney, on behalf of Mr. Thomas Icely, of Coombing Park, Carcoar, 300 very superior Durham cows in calf to an imported Durham bull, and with calves at their sides ; also 12 superior Durham bulls, 2 years old, by Comet.

Mr. P. P. King, manager of the Australian Agricultural Company, Port Stephens, has for sale in Sydney, 6 young Durham bulls and 25 Durham heifers in calf to pure Durham bull.

The Hunter River Auction Company have for sale, on behalf of Dr. Bowman, 20 good milk cows of the Durham breed, and three superior bulls bred by Dr. Bowman.

Mr. Samuel Lyons has just landed by the ship "Hope" two young Yorkshire bulls ; also by the ship "Earl Grey," three superior Durham bulls. (Mr. Lyons sold these cattle shortly after landing. Mr. John Terry Hughes bought two young bulls, under 2 years old, for £420, and sent them to Illawarra. Mr. Thomas Walker bought one bull at £94 and another at £74, and sent them to Inlay's station at Bega, for whom he was acting as agent.)

In 1840 Messrs. Alexander Berry and W. C. Wentworth were shipping large consignments of cattle to various ports in ships fitted for the purpose. The Australian Auction Company landed, per ship "Competitor," seven purebred Durham bulls and three purebred Hereford bulls. Four of the Durham bulls brought £600 by auction, and were sent on to Manaro ; one white Durham bull brought £60, and went to Argyle ; one roan bull brought £180. (This bull was by Knight's old grey bull.) One yearling bull by You *de* Favourite out of a Phoenix cow was bought by John Terry Hughes for £50. This bull was stated to belong to the best blood in England.

An imported bull owned by Mr. Dawson, of Charlotte-place, Sydney, was purchased by Mr. William Wilson, of Fairy Meadow, Wollongong, for the sum of £128. This was a strawberry Longhorned Durham bull of special quality, and had been a few years at Mr. Dawson's estate, Glenfield. The Australian Auction Company imported, on behalf of Mr. Alexander Berry, a large consignment of stock, including English, Scotch, and Dutch cattle. These cattle were first landed at Tasmania and brought hence in the "Australian packet" to Sydney, then driven down the coast to Coolangatta, where they were to be used for dairy purposes. The same company imported one pure Durham bull, 20 months old, bred by Mr. Smith, England, and combines the most fashionable blood. This animal was purchased by Mr. David Johnston, of Illawarra, and was represented as being of beautiful proportions.

The Australian Auction Company had for sale 850 acres of land originally granted to Hughes and Hoskins, bounded by the township reserve of Kiama and Jerrara Creek and the properties of A. B. Spark, Esq. The Government sold several allotments of land in Manning and Barroul streets, Kiama, at satisfactory prices.

After the Keelogue Estate was sold by Mr. J. Hubert Plunkett, Mr. Lomax, who had been residing on that estate, went to live on Mr. Henry Osborne's property at the Illawarra Lake. He had a very valuable breed of cattle, and imported several high-class Durhams. He had two bulls ; one was a strawberry roan, and the other a beautiful red-colored animal. Mr. T. G. Lomax's cattle soon became famous in Illawarra, and many of the more modern breeders traced their strains back to the Lomax Shorthorns and Red Lincolns. The Red Lincolns of those days were remarkable beasts, inasmuch as in general appearance it was often extremely difficult to say that animals

OPENING UP THE COLONY.

of this breed were not possessed of more than a cross of Devon blood in their veins. They were, however, splendid milkers, and possessed good constitutions.

The Australian Auction Company sold in Sydney 200 head of cows and heifers of the Durham breed, in calf to imported bulls from the celebrated herds of Captain Piper and Mr. A. F. McKenzie, of Bathurst, and Mr. Thomas Icely, of Coombing Park, Carcoar. These cattle were much liked by the settlers, and Sydney being the chief market of the colony, many of the coast dairymen purchased these cattle through their Sydney agents, who were principally city merchants trading in cattle and their products and farm produce. The Hunter River Auction Company, which was a branch of the Australian Auction Company, sent mobs of cattle to Sydney market; these animals would eventually be purchased by coast buyers to supply the increasing demand among the smaller settlers, who had but scant opportunities for rearing stock. One of the largest sales conducted in the colony up to this date was that of Richard Jones, Esq., M.C., who owned several cattle stations. He had the Fleurs Estate, South Creek, on which he carried on breeding. His cattle were of very superior quality, and comprised the Devon and Durham breeds. The chief cattle in the market for dairy purposes were Durhams, Ayrshires, Devons, and Suffolk breeds. Howe's cattle were mentioned as Howe's breed, and Macleay's cattle as Macleay's breed.

In 1841 Ben Boyd was building a town and port at Twofold Bay; had already two steamboats and a schooner yacht, the Wanderer. He had obtained possession of a vast number of sheep and cattle stations. He branded his cattle from hip to shoulder with "BEN BOYD." He also devised a wild scheme of saving labor by putting 3000 sheep instead of 800 under the charge of one shepherd on horseback. He despaired of the prosperity of the colony, unless the wages of a shepherd could be brought to £10 a year, or about 3s. 10d. a week, with meat and flour—without tea and sugar. The two last had been previously universally allowed. He engaged 100 men in Sydney at this wage, and sent them by boat to Twofold Bay, free; but they were to pay £5 for a return passage. A number of them walked back to Sydney. Boyd founded the Union Club, Sydney.

Mr. Joseph Townsend, speaking of the Berry Bros.' estate, Coolan-gatta, in 1842, said:—"Great pains have been taken to improve the breed of cattle on this estate, and bulls have been imported from England at great expense. 'Ella,' a fine Longhorned Durham, is a splendid creature, and cost £500; and there are also some beautiful Ayrshire bulls. Choice animals of this description are kept for sale, in an extensive clover paddock devoted to them alone; and to this place they become so much attached that there is a difficulty in removing them, even in the company of cows. Some of the bullocks, reared and fed on this country, attain a great size, some as much as 15cwt., and the rolls of fat on their backs form hollows something like a saucer. One beast yielded 250lb. of caul and kidney fat; and 5cwt. of tallow was obtained by boiling down two of them—all grass-fed. Drafts of fat cattle are constantly sent from this estate to Sydney, and many dairy cows sold to other settlers. A large dairy is kept on foot, where often 200 cows are milked, but only once a day; for, after the morning's milk is taken from them the calves are allowed with them until night. These cows yield about two gallons of milk each per day; and under another system would doubtless give more. The skim-milk feeds a little army of pigs. Many beautiful mares are to be found among the herds of horses; and a stallion from the English turf was in the stalls. The horses bred on this property attain a great size; their points are well developed, and many have been sent to India."

In describing the boiling-down establishments as carried on by the Messrs. Berry and other settlers in the colony, Mr. Henderson said:—

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

"The process of boiling-down, resorted to during the panic, when stock was nearly at zero, was a very happy idea, as it not only at once made sheep and cattle worth the price of their hide and tallow, but acted beneficially by thinning their stock. The process itself is very summary. Large cauldrons were provided; the beasts were skinned, cut in four, and thrown in, and the fat skimmed off, strained, and put into casks. The heads, bones, and refuse were all thrown away as valueless in a country where manure is not used, the land tilled being of the richest and not yet exhausted. The waste, however, was great, for much might have been made of gelatine, hoofs, horns, &c. The tallow, of both mutton and beef, was in most cases excellent, and commanded high prices in London. This was a grand epoch in the history of the colony. A good deal of beef was salted during the winter months, that being the only season at which it can be done.

"The owners of this estate, the Messrs. Berry, reside in an excellent brick house which crowns a rising ground. Well-built cottages have been erected in convenient situations for the accommodation of the different superintendents. The Shoalhaven, being navigable, adds much to the value of the property; and the produce of the farm is sent up to Sydney in vessels built on the river. The estate would maintain some thousands of people, but the owners of it can never become rich by farming it. To give an idea of the value of farming produce in this colony, I may mention that one of these gentlemen told me that he once grew 2000 bushels of barley, but could only find purchasers for one-half the quantity. The dairy was returning at the rate of £70 per week in butter alone. This was the celebrated Jindyandy Dairy.

"After leaving the mansion of Messrs. Berry, and travelling along a fine beach for about nine miles, the district we have entered is called Illawarra, the native name bestowed by the aborigines; and I have been told that the "native" meaning of this beautiful land, Illawarra, means "Happy Valley."

Mr. T. H. Braim, writing in 1843, said:—"We can confidently recommend—particularly at the present moment—New South Wales as the most desirable sphere for the capitalist and man of fortune. The most inveterate croakers amongst us are now well convinced that our colony must very soon emerge from the difficulties which are now pressing upon us, and when that is the case a healthier state of things in relation to our monetary interests will doubtless be induced. At this moment property of all kinds is sadly depreciated. Good cattle are to be had at from £2 to £3 10s., sheep at 5s. to 6s., and land is sold for a mere trifle.

"To any person with a small capital to embark, possessed of ordinary prudence and business habits, we have no hesitation in stating that this colony presents attractions seldom to be found. We believe that such a person would now require but a comparatively short time to double his capital. The arrival of some few such persons, possessing not only the desire to enrich themselves, but to benefit the land, would be no small advantage to us at the present juncture. Their arrival among us, and their careful and well-directed employment of their resources, would tend materially to hasten the period we have anticipated. To one such individual (Mr. Ben Boyd) we are already indebted for a seasonable employment of labor, and we trust we shall not have to wait long before others appear among us to do the State some service. We assure them they will receive a safe and abundant reward for such public-spirited efforts.

"We have stated our belief that this colony will recover from the depression which has of late weighed upon us, and we ground our belief on the fact that the colonists are beginning to open their eyes to the real condition, to develop the resources of the land, and to

OPENING UP THE COLONY.

recover from the careless habits into which they had sunk. 'Tis true, the storms of adversity are now howling around the land. Fear and trembling have seized upon her merchants and bankers, her tradesmen and mechanics, her agriculturists and graziers, and many are ready to give up all for lost. A panic has seized upon her people, and under its maddening influence everybody is anxious to sell, and nobody willing to buy. The inevitable consequence is that property of all kinds has become already depreciated. Three years ago the colonists were drunk with exaggerated joy; they are now just as drunk with exaggerated despondency. And as the elation of their spirits then caused property to mount too far—far beyond its intrinsic value—so their present dejection has caused it to fall as deeply below what it is fairly and honestly worth.

“Meanwhile, however, the bones and sinews of colonial wealth remain precisely as they were. Our vast extent of territory has not been contracted; our soil has not been impoverished; our hills and dales are still clothed with living and spontaneous verdure; our skies are not less bright; our climate not less genial; our flocks and herds are still thriving and multiplying; our fleece still retains the peculiar virtues for which it has been so highly valued in Europe; our new export of tallow promises to be as profitable as that of our staple commodity, wool; and we shall no longer be obliged to trust to chance to decide the value of our flocks and herds.”

In 1847 Governor Sir Charles Fitzroy imported into New South Wales a few purebred Brahmin cattle. A few years later Mr. Pye, of Parramatta, obtained a few head of these Brahmin cattle and bred them pure. Mr. E. H. Woodhouse, of Mount Gilead, Campbelltown, afterwards bought a pair (a bull and a cow) from Mr. Pye. At a sale of the Mount Gilead stud herds in 1880 the following advertisement appears:—“Purebred Brahmin cattle, one bull and one cow. These cattle were bred by Mr. Pye, of Parramatta, and are represented to be directly descended cattle imported by the late Sir Charles Fitzroy. They are a very handsome pair, and both in full breeding power.”

Writing in 1847, Governor Fitzroy stated:—“I have received a despatch from the Right Hon. the Secretary of State on the subject of establishing steam communication between England and this colony, by way of the Cape of Good Hope, and by means of vessels fitted with auxiliary screw propellers. The great importance of a speedy introduction of any means to effect a certain and rapid postal communication with England is so obvious that it needs no further comment.”

During much of the early history of this colony, and particularly in the old racing days, there were no less than three “Exeter Farms.” No. 1, situated at South Creek, owned by Charley Roberts; No. 2 was situated near Sutton Forest, owned by Henry Badgery; No. 3 was situated in the Braidwood district, and owned by Messrs. Hassall and Roberts, who were for years associated with Mr. Ette D’Mestre, who owned the famous Terrara stud, on the banks of the Shoalhaven River.

CHAPTER VI.

FOUNDING THE ILLAWARRA HERDS.

Hitherto we have been forced to fall back upon the personal private opinions of writers who have long since passed away from the scenes of Australian bush life as the expounders of the exploration, discovery, and development of the dairying lands of New South Wales, whose statements might be convicted paragraph after paragraph by the sweeping accusations of a smart but superficial writer; but on the other hand the writer is not prepared to allow that what has already been written in the foregoing chapters cannot withstand the light of an Australian noonday sun, but we are entering upon a new era in our history—a time when dairying became a separate industry, a time when its history ceased to be a mere series of records or a catechism of events.

Prior to this era men of capital took up large areas of land depastured stock thereon, and milked cows but once a day, the chief income being the progeny thereof. But our fathers and mothers were migrating in hundreds to New South Wales. Having torn themselves away from the fascinating scenes of their native heath, with the love of a home firmly entrenched in their breasts, and being born, as it were, in the home of the dairy cow, they very quickly adopted the habits and customs of bush life, and with the aid of the clearing lease system, then in vogue, and a few head of cattle soon supplanted the large landholder and grazing right systems which had obtained for nearly half a century in New South Wales. Two instances, which the writer can vouch for, will suffice to show what had to be faced by those men and women who laid the foundations of dairying on a sound basis during the years from 1840 to 1865 in this country. In 1840 my late father migrated to Australia. One morning shortly afterwards he found himself in Sydney, friendless and penniless. The following morning he was in Wollongong, having had to carry my mother and an only child on his back through the waves, waist deep, to the shore. That same evening he was on top of a bullock dray which was loaded with general merchandise en route for Marshall Mount, the home-stead of the late Mr. Henry Osborne. The morning after he was placed in charge of a dairy—cows and horses. There he remained for about six years. In the January of 1846 he started for the Kangaroo Valley with packhorses and mules to undertake the management of a large dairying and cattle-breeding concern for Mr. Osborne. "Thou wert faithful in small things, I shall place thee over many," seems to have been his master's idea, for were my father remained another six years. The only inlet and outlet worth the name being what was ever after called, the old butter track. The next the writer wishes to refer to occurred immediately after the passing of the Robertson Land Bill. The late Mr. John Hanrahan and his brothers-in-law, William and John Davis, and Gerard Armstrong—men who had penetrated almost every nook and ravine on the South Coast in search of cedar—armed with a small pocket compass, brush hook and axes, cut their way into the dense bush of Wingecarribee, and having selected land, quickly set to work to establish dairy farms. In those days there were only three houses between the Jamberoo Mountain and Berrima, viz., Stagg's, Shippley's, and Throsby's. Shortly afterwards thriving townships sprang up. These are two out of the many similar instances with which the history of the development of the dairying industry supplies us during those years which are about to

FOUNDING THE ILLAWARRA HERDS.



WILLIAM MOLES, Esq.
Born Co. Monaghan, Ire. 1829
Residing Illawarra 69 Years.



JAMES MCGILL, Esq.
Born Angleshire, Scot. 1821
Died Croome, N.S.W. 1890.



JOHN RUSSELL, Esq.
Born Linlithgowshire, Scot. 1834
Residing Illawarra 69 Years.



WILLIAM JAMES, Esq.
Born Cornwall, Eng. 1825
Died Shellharbour, N.S.W. 1888



JOSEPH DUNSTER, Esq.
Born Kent, Eng. 1826
Died Shellharbour N.S.W. 1877.



HERBERT BARTLETT, Esq.
Born Somersetshire, Eng. 1843
Residing Illawarra, 45 Years.

HARDY ILLAWARRA PIONEERS.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

come under review. The fortunes of individual families among the many who made their homes in Illawarra, the offshoots of which went forth into the Wingecarribee, Twofold Bay, and Richmond River districts in the sixties and seventies, are made, in a later generation, the measure of the example and teachings of those sturdy pioneers of the late thirties and early forties.

Let it not be supposed, however, after what has just been said, that in attributing so much importance to the courage and industrious habits of those settlers under review that the triumphs of dairying and cattle breeding were abandoned to their forces alone, without that co-operation of men with land and capital which the times and circumstances required. Such names as Captain John Macarthur, Messrs. W. C. Wentworth, Henry Osborne, David Johnston, John Terry Hughes, John Ritchie, James Robb, James Mackie Grey, David Berry, John Hawdon, Thomas S. Mort, and the brothers Imlay, Drs. George and Alexander and Mr. Peter Imlay, shall long be remembered as being men of sterling worth. Later on, when new men stepped into their place, the changes and developments became so numerous that it is a thing impossible to record in one volume, such as this, anything like the number of events that occurred which had in one form or other an influence on the dairying industry.

Although much has been chronicled of the happenings of the settlers of the counties of Camden and St. Vincent prior to and during the years 1840-45, there will be at all times room left for the recorder, as each station holder had, as it were, his own settlement, not necessarily, nevertheless often, independent of his nearest neighbours. The settler's station was his kingdom, which he ruled or governed as he pleased, and on which he carried out, weather permitting, whatever plans or schemes happened to be uppermost in his mind during his lifetime. This does not infer that there was not boundless hospitality in those days among the settlers. It merely is intended to show that each man had his own pet system of working out his own destiny.

As has been shown elsewhere, there were several importers of cattle and the smaller settlers were not slow to take advantage of good sorts when and where offered for sale or barter at the general market prices.

It was about 1846 that Mr. John Terry Hughes leased "Duke," a strawberry Durham, from Mr. Henry Osborne. Mr. John Terry Hughes had, of course, other breeds of cattle as well as Durhams, including a very large percentage of the Longhorns imported and bred for years at Camden by Captain John Macarthur. These animals when crossed with the Durham could not be more easily described than by calling them strawberry and yellow brindled ballies. Messrs. Lomax and Osborne, as has been already stated, had the Red Lincolns. It was, therefore, from stock bred by Messrs. Henry Osborne, John Terry Hughes, Macarthur, and Lomax, all of whom imported direct from the old country, that the celebrated herds of Messrs. Duncan Beatson, Evan Evans, Andrew McGill, William Moles, and others sprung up in the early fifties.

To show the influence of Red Lincolns, Mr. Evan Evans had a Lomax bull in the late fifties which he called "Nonsuch," which with some heifers he sent down to his station near Ulladulla, named Murremurang. From there the progeny of this red bull got into the possession of many of the chief cattle breeders of Ulladulla. The progeny of this bull could be traced for years as far south as Mr. Robert Ritchie's herd on the Jellat Jellat flats at Bega. Heifers from Murremurang by this bull were brought up the coast by Mr. Evan

FOUNDING THE ILLAWARRA HERDS.

Evans, and purchased by Mr. William James, of Shellharbor, in the early sixties.

Both Mr. Duncan Beatson and Mr. Andrew McGill had bulls in their herd of the Messrs. Henry Osborne and T. S. Lomax's Red Lincoln strain. Mr. Beatson sold off his entire herd many years ago at the enormous average, at that time, of £15 per head. The McGill strain is well known to most modern breeders of dairy cattle. The deep red and red and a little white on either flank has been noticeable throughout the district, especially in the herds of the Messrs. Black (Kiama), and Boyd Bros., in the Berry district.

One fact stands out plainly in tracing the history of these Red Lincolns, in that in every instance among the early breeders roan or white Durham bulls were used simultaneously with them in the same herd. It was from heifers bred in this manner from the bull "Major" that Mr. Robert Ritchie established his dairy herd at Jellat Jellat, Bega, in the late sixties, Major being mated with the "Non-such" heifers that had been bred and reared at Murremurang and Dapto, under somewhat peculiar circumstances.

In proof of the origin of the best of our dairy herds being bred from the sources mentioned throughout this history of the Illawarra cow, let us turn to Mr. Archie McGill, who states:—"My late father (Mr. Andrew McGill) purchased six heifers in 1851, bred by Mr. John Terry Hughes, by the bull leased from Mr. Henry Osborne (Duke). The names of these six heifers were as follows:—Durham, Yorkey, Lilly, Reddie, Strawberry, and Whiteface." Afterwards Mr. Andrew McGill purchased cattle from Messrs. Duncan Beatson, David Johnston, and Henry Osborne. He then purchased a crossbred Short-horn bull from Mr. Evan Evans, bred by Mr. Howe, of Glenlee, and another bull from Mr. T. S. Lomax. He next purchased from Mr. Duncan Beatson two of his choice cows of the Lomax strain. Their names were Lofty and Queen. It would appear Lofty was in calf, and as it turned out to be a bull which was in due course mated with Queen, the result was a heifer, which was called Queen II. Queen II. was mated with a Durham bull, a descendant of Mr. D. Johnston's Melmoth. The result of this mating was "Scotch Jock." Mr. McGill's celebrated cow, Mary Queen of Scots, was out of a half-sister to Queen II., and by a bull bred by Mr. McGill from Dairymaid, a cow bred by Mr. W. W. Jenkins, of Berkeley, near Wollongong."

The best authorities state that Mr. McGill's Mary Queen of Scots was one of the finest specimens of a dairy cow that anyone might wish to see. She gave evidence of Mr. James McGill's often repeated theory that, in order to concentrate quality, great care must be exercised in selecting and mating the female animals. In this instance we have proof that Mr. Andrew McGill purchased three picked cows for his purpose, viz., Lofty and Queen from Mr. Duncan Beatson, and Dairymaid, a cow bred by Mr. W. W. Jenkins, from a Mr. Hockey, which were three of the finest cows in his neighbourhood, and bred from them successfully until he produced his ideal type of dairy cow.

Many of our breeders have since attempted to follow in Mr. McGill's footsteps, but in the first place few have the pasture which was afforded stock in those days on the "Hopping Joe" Meadow, and fewer still have the opportunities at their command. His farm was situated within an hour's ride of the estates of Messrs. David Johnston, John Terry Hughes, Henry Osborne, Duncan Beatson, T. S. Lomax, and Evan Evans. It will then be easily explained how it was that these breeders, most of whom had interests in cattle stations on the tableland, could keep up a supply of dairy cattle.

In the early fifties there was a great demand for good sorts of Durham cattle in Illawarra and the Shoalhaven Valley for the cattle

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

stations on the North Coast. Mr. Clark Irving, of the Tomki Estate, Richmond River, and Mr. C. G. Tindal, of Ramornie, Clarence River, purchased stock. Mr. Tindal's purchase included Mr. Henry Osborne's Durham cow Charlotte, by Duke (imp.), for £100. At this time Mr. Osborne was offered a tempting sum of money for a splendid Longhorn Durham cow, "Tallboy," a half-sister to Charlotte, but he could not be drawn, which to a great extent proved his judgment, as Tallboy afterwards produced the bulls which sired the heifers which commanded high prices for many years from the coastal dairy farmers. Tallboy's dam was by the imported strawberry Durham bull out of a daughter of Brutus.

It was during the years 1845-50 that Mr. Evan Evans gave up store-keeping and commenced dairying at Penrose, Dapto. He had for a short time previous been purchasing calves from the small settlers around Dapto, and sending them off to the southern tableland until they were forward in calf and then bringing them back and disposing of them to the dairymen around the district. But when he commenced dairying he went to Camden and bought ten heifers and two bulls from the estate of Mr. William Howe, of Glenlee. He shortly after purchased young bulls from Messrs. T. S. Lomax and Henry Osborne. These animals, in conjunction with the stock purchased in the district, as just mentioned, laid a solid foundation which carried the superstructure built up by his son, Mr. Evan R. Evans, well on into the seventies. Mr. Evan Evan, sen., was largely interested in a station property in conjunction with Mr. Henry Osborne, situated in the Lachlan district, in the vicinity of Gundagai, called Waggra. The calves from Illawarra sent there and brought back again to their native climate were dairy cattle of a type and excellence not seen to-day.

It was during the years 1855 and 1865 that the boom set in in beef cattle. Buyers were on the alert, and nearly all the cows showing a preponderance of Shorthorn, Hereford, or Devon in their general outline and color were quickly bought up to mate with the pedigreed bulls of those breeds that were being imported to New South Wales in great numbers. By 1860 every dairyman of note from north to south of the South Coast was trying to prove to the satisfaction of some buyer or other that certain roan, red, or bally cows in his herd were bred by some noted Shorthorn, Devon, or Hereford breeder, in order to effect a satisfactory sale. It is very easy, therefore, to explain away the cause for the absence of authentic written statements regarding the pedigree of so many of our so-called imported bulls. The absence of pedigrees is very marked in all the early Shorthorn, Hereford, and Devon herds that were established between 1854-64.

With such facts in front of us, is there any wonder that we should have our doubts about the correctness of a pedigree based on a certain bull stated to be imported, when almost in the same breath the owner says, "Pedigree lost." When the human eye detects, and reason suspects, a cross in a bull or a cow, the owner, in the absence of authentic proof, may expect trouble should he attempt to use the word "purebred."

Not much can be gained from the show reports of former days with regard to the breeding and mating of dairy cattle. Therefore, any show report cannot be availed of by anyone not actually in possession of the history of the breeding of the animals exhibited. For example, at the Show of 1860, held in the Market Square, adjacent to Elliot's Hotel, Wollongong, the report says:—"Among the horned stock a fine two-year-old bull belonging to Mr. A. McGill, which took first prize, was pronounced by competent judges to be equal to any animal of its kind ever exhibited in the district. The same gentleman also showed a remarkably well-bred cow from imported stock."

FOUNDING THE ILLAWARRA HERDS.



SAMUEL MARKS, Esq.
Born Sydney, N.S.W. 1835.
Died Kiama, N.S.W. 1907.



JOHN HAURAHAN, Esq.
Born Co. Tipperary, Ire. 1815.
Died Robertson, N.S.W. 1886.



CHARLES McCAFFREY, Esq.
Born Co. Fermanagh, Ire. 1806.
Died Jamberoo, N.S.W. 1890.



EDWARD LARKIN, Esq.
Born Sussex, Eng. 1813.
Died Appin N.S.W. 1885.



HUGH DUDGEON, Esq.
Born Co. Fermanagh, Ire. 1842.
Residing Illawarra, 54 Years.



GEORGE WOOD, Esq.
Born Jamberoo, N.S.W. 1836.
Died Jamberoo, N.S.W. 1896.

FAMOUS ILLAWARRA SETTLERS.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Now, if we accept Mr. Archie McGill's statement—and there cannot be any reason assigned for doubting it in any particular—there is strong evidence that the two-year-old bull and the cow mentioned in the show report of 1860 were no other than Scotch Jock and Queen I. If these were not the identical animals—which matters little, as they were in the family—they were undoubtedly very near relations of the two animals in question. Further, it goes to show that from the herds of Messrs. Henry Osborne, J. Terry Hughes, David Johnston, T. S. Lomax, and W. W. Jenkins, through the purchases from Mr. Beatson and Mr. Hockey, Mr. Andrew McGill established his celebrated dairy herd.

There is a name which has figured largely in the early history of Illawarra and its development—namely, the Brown family. But in writing of the Browns of Dapto one might get very easily confused. In order to explain matters we will take Mr. William Browne, merchant, of No. 2 Spring-street, Sydney, who owned the Yallah Estate. He was at one time in his career a great racing man, and kept a stud of blood horses at Yallah, including a few specimens of the Arabian breed. Somewhere in the late thirties he became associated in business with the Imlays, of Bega. Then we have Messrs. George Brown, sen., and his son, John Brown, of Dapto proper, and a William Brown, a shipwright, who erected the wind-power flour mills in South Dapto. In the early thirties and forties, therefore, we have the family of Brown, which include the subjects of this review—that is, Messrs. George (father) and John (his son), who had carried on the joint businesses of flour milling, dairying, and hotel keeping successfully for a number of years. Having migrated from the Liverpool district down the ranges (whence a very large percentage of the early Illawarra settlers came) in 1829, they experienced all the advantages together with the disadvantages of the pioneering days.

Without going into further details, Mr. George Brown in the early forties purchased two cattle stations on Waterloo Plains, Monaro, from Mr. John Hoskins (who was the first Mayor of Sydney). These stations were named Kydra and Glenbog. He commenced cattle raising, and a few years later purchased ten young bulls from Mr. Lomax, of the Durham and Red Lincoln breeds, and sent five each to his Monaro stations. Mr. George Brown died in 1851, and his son, Mr. John Brown, of Dapto, commenced selling drafts of heifers in Dapto. A Mr. Collie was the auctioneer. Mr. Brown thus disposed of 550 head of cattle in a very short space of time to the dairymen of the South Coast. Born at Liverpool, New South Wales, in 1827, he arrived with his parents at Wollongong in 1829, and has remained in the district ever since. Though not a dairyman in the sense, he has always been associated with dairy cattle.

After perusing what Mr. Archie McGill, of Greenmount, Albion Park, and Mr. John Brown, of Dapto (both of whose statements are worthy of the highest respect), have had to say on the influence of Messrs. Osborne, Terry Hughes, and Lomax's imported cattle on the early herds of Illawarra, it is well, however, that we should carefully study what Mr. John Russell, of Croome (of whom it may with all truth be said there is no better authority), has to say of the foundation of Mr. Duncan Beatson's herd, and a host of other herds located between the mountain ranges, the Illawarra Lake, and the Shoalhaven River, which comprised the greatest proportion of the Illawarra district at the time, and since Mr. Russell's arrival in the district, to wit, 1840.

Prior to Mr. Russell's arrival in Illawarra and location on the Terry Hughes' estate (now Albion Park), Mr. John Terry Hughes had a herd of cattle, principally composed of Durhams and Longhorns, which were kept for stud purposes, as has been stated elsewhere, at Shancomore, near Bringelly, in the county of Cumberland.

FOUNDING THE ILLAWARRA HERDS.

This property was situated at the junction of the Bringelly Creek with the Nepean. It has also been stated that in 1844 Mr. Henry Osborne imported a very remarkable strawberry Durham bull about two years old, which he kept in his stud herd till about 1846, when he leased the bull or exchanged him for one imported by Mr. J. Terry Hughes. "In 1842," says Mr. Russell, "Mr. Duncan Beatson became manager for Mr. John Terry Hughes at Terry's Meadows (now Albion Park), and the following year (1847) the English bull, with a bull called the "Bally bull," were put into the herd for stud purposes by Mr. Beatson."

In case some of my readers might labor under the impression that this "Bally bull" was of the Hereford breed, it is better to state at once that the animal in question was of the Longhorn breed, from the stud of Captain John Macarthur, of Camden, as Mr. Russell distinctly indicates, when he describes these Longhorns, as follows:—

"They were brindled and yellow in color, long frames, long heads, with very long crooked horns of various shapes, large-sized udders, and long teats." Some of the cows were strawberry-roan in color with white strips on the back and down the face." Mr. Russell is positive that nearly every dairy herd of note between Bulli and the Shoalhaven River were based more or less on the progeny of these two bulls or from the matings of these bulls with other importations." Mr. Russell is very emphatic when describing the strawberry English bull imported by Mr. Henry Osborne, and says: "That English bull was the best bull ever seen in New South Wales." Mr. Russell also gives a list of names of those who had purchased young bulls by the strawberry English bull prior to 1850: "Dr. Jerrard, (Dapto), T. S. Lomax (Lakelands), Jessett and Tritton Bros (Dapto), Enoch Fowler (Oak Flats), and the Swan family." Mr. Russell further adds: "The dairy herds of the dairymen just mentioned never received any hand feed, yet thirty-six quarts of milk per day was not considered a wonderful performance for one of those Longhorned cows, nor were they like the cows of the present day, which commence to go off their milk as soon as they go in calf. Those cows would, without much care or attention, milk ten months in the year, year in and year out for years."

In proof that Messrs. John Terry Hughes and Mr. Henry Osborne bred practically on the same lines, Mr. Russell states: "In the year 1855 Messrs. Henry Fredricks, John Colley, and James Spina's purchased from Mr. Henry Osbourne thirty herd of springing heifers at £10 each, dividing them equally when they got the heifers to Jerrara, near Kiama." Mr. Russell describes these heifers as being "mostly of the cross between the Longhorned and Shorthorn breed, with a few roan and red colored animals among the mob." This statement bears out exactly the often repeated story which went to show that Mr. Henry Osborne never cared to part with his fancy colored animals. The Messrs. Black and Boyd families made their purchases from Mr. Osborne shortly afterwards. It will be seen from the authentic statements of Messrs. Archie McGill, John Brown, and John Russell, all of whom are alive to-day, and still associated with the dairying industry, that at least twenty years before the bull "Major" was seen or heard of in Illawarra, there were better bulls and a much better type of dairy cattle than has been seen since the sixties. The three gentlemen just quoted do not stand alone in their opinions, as it was the almost unanimous verdict of our fathers in the seventies and eighties.

In 1856 Mr. David Johnston commenced selling off his valuable herd of purebred Durham cattle. These choice animals were submitted to the "hammer," and found ready purchasers among the cattle men of Illawarra. The sales were held at the sale yards, Brown's Hotel, Dapto, Mr. Collie being the auctioneer.

CHAPTER VII.

IN THE FIFTIES AND SIXTIES.

We need not go into any description of the origin of the Longhorn breed of cattle which played such an important part in the founding of so many of our best herds in Illawarra, as shown by Mr. Russell and others. To be candid, the fact is their origin is lost to us. Perhaps at some future date the records of this once famous breed of cattle may be discovered among what now remains of the ancient manuscripts of Ireland.

That the Longhorns were originally brought from Ireland into England, and without the consent of the Irish, goes without saying; but the past in this instance must now remain among the musty shelves for future investigation.

Most English authorities are agreed that the Longhorned bull Bloxedge was to the Longhorns of England (and as far as that goes, of Australia) what the bull Hubback was to the Shorthorns. Bloxedge is mentioned as being of the "Canley" breed of Longhorns, yet this animal by all accounts in no way resembled the Longhorns with the exception of the horns, and what is more remarkable still, no other sire got truer or better types of Longhorns. But on this subject history is not clear.

Without going into Mr. Bakewell's system of breeding Longhorns, and passing by for the present the accounts given of the bulls Bloxedge, D, and Shakespere, or any such Longhorned sires, and take up Youatt's work on the breeds of cattle. There we find that there existed a Longhorned breed prior to Bakewell's time. "A blacksmith named Welby in Derbyshire had a fine herd of Longhorns in 1720." Further, it was from a noted breeder of Longhorns named Webster that the bull Bloxedge was obtained. Further still, we find that "Bakewell," who is credited with being the founder of the Longhorn breed of cattle in England, was not born till 1725, and as he must have been at least 20 years old before he became a cattle breeder, how could he be the founder of the Longhorns? Certainly he never bred the original Longhorned cattle referred to in Youatt's "History of the Breeds of Cattle," published 1835. The Longhorns, like the Devon or Jersey, must remain an animal of disputed origin prior to these breeds having become the cherished possession of the Celts anterior to the 10th century of the Christian era. The Englishman's love for beef and fancy colors destroyed indirectly many a valuable dairy herd in England, and afterwards in Illawarra, and the passing away of the Longhorns can be attributed to nothing else than the introduction of beef Shorthorns among our dairy herds.

Since the Longhorns, the Longhorned Durham, and the Red Lincolns have been absorbed by the beef breeders and converted into beef types, the Shorthorn has been resorted to to fill their places. But the Shorthorn was never intended to be a dairy animal, and dairymen have had to use the Ayrshire breed either openly or on the sly to break down those huge beef-producing animals in order to get milking quality, and milking quality as a rule produces type. Hence we say with all truth the cross between a Shorthorn and an Ayrshire gives us a fine type of animal for the dairy. In other chapters I shall endeavour to explain my reasons for arriving at these conclusions.

Speaking at a show dinner in 1867, Mr. James McGill thus described the Longhorn breed of cattle that were to be seen years before the above date roaming over Mr. De Arcy Wentworth's Peterborough

IN THE FIFTIES AND SIXTIES.



JOHN BROWN, Esq.
Born Liverpool, N.S.W. 1828.
Resident Illawarra 83 Years.



EVAN R. EVANS, Esq.
Born Dapto, N.S.W. 1835.
Died Dapto, N.S.W. 1907.



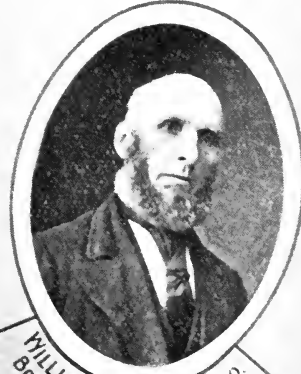
ARCHIBALD CAMPBELL, Esq.
Born Invernessshire Scot. 1834.
Died Wollongong, N.S.W. 1903.



JOHN LINDSAY Esq.
Born Co. Tyrone, Ire. 1832.
Died Dapto, N.S.W. 1894.



FRANK O'DONNELL, Esq.
Born Illawarra, N.S.W. 1843.
Accidentally Killed, Wollongong 1851. 1906



WILLIAM MUSGRAVE Esq.
Born Co. Tyrone, Ire. 1821.
Died Dapto, N.S.W. 1905.

WELL KNOWN SOUTH COAST MEN.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Estate, Shellharbor : " They were," said he, " of the improved Craven or new type of Leicester breed of cattle—and amounted to many hundreds—and for regularity and size and general contour immeasurably superior to any similar number of cattle to be seen nowadays. Johnnie Ritchie, that prince of bush riders, with others, including the native black, Billy Broughton, were ever busy collecting them. They all carried Mr. Wentworth's brand, DW."

In 1855 Sir Charles Fitzroy, Governor of New South Wales, retires, and is succeeded by Sir William Denison, formerly Governor of Tasmania, and the first railway in New South Wales—Sydney to Parramatta—is opened. Steam communication with England is stopped owing to the Crimean War. The Sydney Mint was opened ; and an attempt made to fortify Port Jackson. The first electric telegraph line is opened to South Australia. Responsible government is established in New South Wales.

In 1855 Mr. William Lee, of Bathurst, imported a Shorthorn cow, " Crocus," with a roan bull calf at foot, got by Grand Turk (12,959, C.H.B.). This young bull was named Grandmaster. In 1856 Messrs. Cox Bros., of Mudgee, imported a Shorthorn bull named Middleham (16,562). Middleham was bred on the same lines practically as Mr. David Johnston's (Illawarra) imported bull Melmoth, and when his stock was mated with those of Mr. Lee's Grandmaster there were great milking qualities in the offspring as the result of such matings. Mr. Thomas Lee's Priam was bred on the lines just mentioned. Priam's stock need no comment further than this : They were good milkers.

In 1856 Messrs. F. and A. Cox, of Mudgee, imported a Shorthorn bull named Middleham (16,562), which in due course sired Priam (202). Priam's dam, Jenny, was by Nugget, Nugget by Melmoth. In 1860 the Messrs. Cox imported Sandysike, by Rufus (22,811), &c. Sandysike sired Primrose (223). Mr. Robert Lowe, of Wilbree, Mudgee, purchased a full brother of Primrose from the Messrs. Cox, of Mudgee, which he mated with a Middleham cow. The result of this mating was a bull calf, which was purchased by Mr. John Boxsell, of Berry, in the sixties. There was much of the beef Shorthorn in Mr. Boxsell's bull, but he left some excellent dairy animals behind his track throughout the Berry district.

In 1810, twenty-two years after the founding of the colony, the sheep numbered 25,888, and the cattle 12,442; by 1821 the sheep had more than quadrupled, being 119,777, while the cattle, 91,235, were sevenfold the old figure. Further evidences of rapid pastoral expansion were the half-million sheep and quarter-million cattle of 1828. Further, from 58,000 in 1843, horses had increased to 116,000 in 1851 ; that is, doubled in less than a decade. Horned cattle had gone from 850,000 to 1,375,000 ; and pigs from 54,000 to 65,000. In the latter year, in what might roughly be classed as settled districts, there were 81,000 horses, not unnaturally as against 35,000 in unsettled regions ; 450,000 cattle, half as many as in the unsettled. Thus in 1851, the year of the great International Exhibition in London, which is still remembered, the then remote Antipodes were making giant strides, prophetic of future pastoral importance. And by 1858 the figures were 200,000 horses, over two million cattle, and 92,000 pigs.

In the month of October, 1858, the lung plague of cattle, or contagious pleuro-pneumonia, made its first appearance in Australia. This disease was introduced through an English Shorthorn cow imported by Mr. Boadle, of Melbourne. The malady ravaged his herd for nearly a year before it drew the earnest attention of the colonists. In September, 1859, we are informed by the " Argus " that a meeting of stockowners had just received the report of a committee, and decided to slaughter the infected herd and reimburse the owner by public subscription.

IN THE FIFTIES AND SIXTIES.

Mr. Boadle said : "The first case occurred in an imported cow, landed in good condition, and giving milk. She was attacked and died in November last, six weeks after arrival. Two others died in the latter end of December and beginning of January. From that to the present time, with only one slight intermission of a month, the ravages of the disease have been incessant."

The committee report :—"That of five animals imported by Mr. Boadle two have died, a third is at present recovering from the attack, a fourth is seemingly recovered, and a fifth has hitherto escaped the distemper. The total number of deaths have been twenty-three ; five beasts have recovered, but are evidently unsound, and on the occasion of our inspection ten were ill, of which four were slaughtered for dissection."

Although Mr. Boadle's entire herd of fifty-one head of cattle were destroyed and the farm quarantined, no legislation was effected until it broke out again in a team of bullocks belonging to a Mr. McKinnon in December, 1860. In 1861 the disease appeared at the Ovens, and in a few months later it was introduced into New South Wales by a Mr. McLaurin from Mitta Mitta, Victoria. Since 1861 there has been many outbreaks of the disease in New South Wales. It is being gradually stamped out. The constant outbreak of this plague was the chief cause of retarding the continuous progression of the agricultural and horticultural industries on the South Coast during the years 1856-68. It was first introduced into Illawarra by a Mr. Stucky.

According to the generally adopted system of dairy farming in Illawarra and Shoalhaven Valleys—in fact, the whole of the South Coast—during the long space of time between 1858-88, the cows got their own living for about seven months of each year, and during the remainder the greater part of their food had to be provided for them. In other words, they were allowed to run out on the pasture from October to April, and then hand fed in the paddocks the remaining months. When the seasons were fair and there were not too many cows kept on the farms, the system was very satisfactory indeed. The reasons given for the success of this system were, in the first place, the climate was by no means severe, consequently the temperature did not affect the stock ; secondly, the cows being so much out in the open air, were generally in better health than they would be enclosed in buildings ; and thirdly, when allowed to gather their own food they always seem to be more contented than when cooped up in pens.

Be these contentions what they may, the system prevailed, and gave general satisfaction throughout the coastal districts ; but on the tablelands a system of stall feeding had to be resorted to during the winter months.

Another system was often suggested, but seldom, if ever, followed—namely, the "soiling system." In this case the whole of the food is cut for the cows, and they are entirely stall-fed. Here the cows are sheltered from the weather ; their manure is saved ; and they have the advantage of abundant food. In order to carry out this system, however, the land would require to be heavily manured and in dry time irrigated, which would mean heavy yields of green fodder.

The advantages of this system will be readily seen by those who are in a position to carry it out advantageously. That an increased supply of milk would be obtained from the cows will be admitted by all, as will also the fact that more cows can be kept on the same quantity of land. But the principal question that arises will be, "Will the extra supply of milk pay for the extra labor required ?"

On the one hand, the cows required no attention whatever save milking for nearly seven months in the year ; whilst under the system suggested the whole of their food must be brought to them, and the

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

stalls and sheds would also have to be cleaned up daily. It is, therefore, clear that to balance the additional expense the milk must be largely increased. But it is very questionable whether this system could be made pay without a cheap system of irrigation. However, the purchase of fodder when it is very cheap, and storing it for times of drought, may yet be adopted with a considerable degree of profit and success all along the coast and tablelands where the city milk supply is largely drawn upon during the greater part of the year.

During the 1853-1852 period much discussion took place as to the acreage required per cow per year. Most farmers were in the habit of saying that "three acres would produce enough food for a cow throughout the year," and regulated the size of their herd accordingly. Much, however, depended on the quality of the soil. This makes two and a-half acres while the cow is out in the field, and one half-acre for crop, on the average for a district of fair quality.

It was during those years a matter of experience with those who kept milking cows for city and suburban use where milk rarely sold under 1s. per gallon, that the better the animals were fed the more remunerative they became. In those instances it paid well to give linseed and rape cake, in addition to the best food that could be obtained on the farms. But in the country, where prices of milk vary from 5d. to 7d. per gallon, the food supplies had to be regulated accordingly, and in anything like fair seasons it is much cheaper to grow the fodder on the farm than to purchase foodstuffs in the Sydney market.

The position, however, of the dairy farmers of the Camden and West Camden districts, and right along the seaboard as far south as Twofold Bay, owing to the great fluctuations in the price of butter and cheese, was by no means encouraging during the sixties and seventies. Butter often was as low as 3d. and 4d. per lb. wholesale, with no defined way out of the trouble. The milk had in consequence to be raised by the cheapest possible system. The cheese farmers were in practically the same position owing to the low price of cheese in the Sydney market.

In 1858, a few years after the first gold rush, most of the gold diggers who had left the South Coast districts had returned and commenced dairying. Some had made sufficient money to buy farms; others, again, had made sufficient only to buy a few cows and rented farms. The result was, with the addition of new arrivals, the Illawarra and Shoalhaven Valley districts filled up rapidly with dairy farmers. They were men of grit, and they, with the assistance of their wives and families, soon began to raise up fine herds of cattle. Among the most notable of this generation of cattle men were men of different shades of opinion as regards the class of stock most suited to the dairy. There were Durham breeders, Shorthorn breeders, Ayrshire breeders, and those who preferred the Ayrshire-Durham cross. (Where the term "Ayrshire-Durham cross" is used it is meant to infer that an Ayrshire bull was mated with a Durham cow, and vice versa when a Durham bull was used with an Ayrshire cow.) Therefore, it may be stated with every confidence that either of these types of dairy animals takes many years of careful mating in order to produce successfully a succession of superior animals from them, as we have seen in the past.

It is just possible that the types of Ayrshire used by Messrs. Howe and Macleay in the Camden district in the thirties, or the Ayrshires used by Mr. Wylie, of Dunlop, Illawarra, and Messrs. Berry and De Mestre, about the same period in the Shoalhaven district, were of a much superior and somewhat different type to those of the present day. This we know from practical experience, and we further know that the types of Ayrshire sent by Macleay to the Ulladulla district, and which subsequently formed the nucleus of Mr. John

IN THE FIFTIES AND SIXTIES.



WILLIAM LOVEGROVE, Esq.
Born Tulso Hill, Eng. 1830.
Died Sydney, N.S.W. 1906.



DAVID HYAM, Esq.
Born Jamberoo, N.S.W. 1835.
Residing South Coast, N.S.W. 74 Yrs.



JAMES WILSON, Esq.
Born Co. Fermanagh, Ire. 1834.
Died Berry, N.S.W. 1901.



DANIEL BOYD, Esq.
Born Co. Donegal, Ire. 1830.
Died Berry, N.S.W. 1906.



THOMAS BROWN, Esq.
Born Ayrshire, Scot. 1839.
Residing Illawarra 54 Years.



JOHN LOVE, Esq.
Born Co. Fermanagh, Ire. 1840.
Residing Illawarra, 57 Years.

ILLAWARRA MEN OF MARK.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Marks' dairy herd at Terragong, Jamberoo, were different to the present type.

The types of Ayrshire imported by Dr. Alcorn, of Shoalhaven, in 1854; and the types of Ayrshire imported by Mr. James Robb, of Riversdale, Kiama, in 1862, although being Ayrshires in every sense, were all different in type. The Macleay Ayrshires were of great length, big-bodied, yellow and white mottled, very much dollar-marked, and threw true to their characteristics, although crossed with other strains, for thirty years. Dr. Alcorn's Ayrshires were of a smaller type, mostly red and white or liver and white in color, with long, well-defined horns; and they were true to their characteristics for thirty years. Mr. James Robb's bull was a very dark-brown, inclined to black, and pure white; the cows were yellow and white and brown and white. This bull was well known in the Kiama district. After being used on the Riversdale Estate for several years he was sold to Mr. George Adams, who afterwards sold him to Mr. John Black, who in turn sold him to Mr. John Marks. At Mr. Marks' sale in 1875 he was purchased by Mr. Neil Harper, who in turn sold him to Mr. McIlraith, of Fountaindale, where he broke his neck jumping a fence. Everywhere this bull went good stock were produced. There was a peculiar black streak in his skin that can be detected in his descendants even to the present day in our show rings. Beyond this one characteristic it is difficult to say that the Robb Ayrshire carried with them any defined distinction not peculiar to the strain.

There were two things, however, held in common throughout by these three strains of Ayrshire, namely, vigorous constitutions and productiveness. Furthermore, all three strains seemed to blend easily with the other breeds of cattle in the districts where they flourished. This characteristic was very pronounced in the Macleay strain of Ayrshires, and may possibly be accounted for by the fact that Mr. Macleay, in the early thirties, purchased a Normandy bull and two cows, which he used in his herd at Camden. This breed resembled the Ayrshire in many respects, but their horns turned downward and then upwards. The Glenlee Ayrshires had also the characteristic of blending freely with the other breeds of cattle, but Mr. Howe had the Durham, Devon, Shorthorn, and the Guernsey breeds on his estate in the thirties.

The Durhams used by Messrs. Osborn (Marshall Mount), Brown (Dapto), Lomax (Lakelands), Johnston (The Meadows), Terry Hughes (The Meadows), and Captains Addison and Hopkins, were entirely different to those imported to the coastal districts in subsequent years. They were all with very few exceptions heavy milkers, which was rich in quality. They also combined docility of temper with a vigorous constitution—qualities that are always looked for in an ideal dairy animal throughout the dairy world.

It would be a mistake to attempt to give an exact description of the developments of dairying and cattle breeding without some special reference to the coastal auctioneers and cattle dealers of the fifties, sixties, and seventies. In doing so, therefore, we shall confine our remarks to those of Illawarra district, which was at those periods the cradle of the dairying industry in New South Wales. We may mention Messrs. Collie & Co's, Dapto and Wollongong; later on Messrs. Fowler and Irvine, Kiama; later still we have Messrs. Waldron and Dymock, acting as general auctioneers throughout the South Coast, with the exception of Twofold Bay, where Mr. William Rixon assumed command of the hammer at all important land and cattle sales.

The early dealers comprised Messrs. William Graham and Read of Shoalhaven and Twofold Bay. Mr. Graham used to collect mobs

IN THE FIFTIES AND SIXTIES.

of cattle from the Berry Bros., of Coolangatta, and Dr. McKenzie, Shoalhaven, and sell them to the dairymen along the coast towards Wollongong, and Mr. Read did likewise with occasional mobs collected from the breeders south of Moruya. Later on Mr. Mat. Feehan commenced trading with Messrs. Hassall & Roberts and Maddrell of Braidwood and Araluen, hundreds of which animals passed through the Kiama sale yards, Mr. Waldron, auctioneer. Later still the Messrs. Hindmarsh Bros. commenced trading in cattle on a large scale, Mr. Dymock auctioneer. Paper money was in circulation to a great extent, and moonlight fittings were by no means uncommon during all those years; nevertheless, men made money then, as now, out of the struggling man on the land. Renting land and immediately afterwards selling the goodwill of the lease was carried too far on the South Coast, but the money thus raised helped to boom the North Coast of New South Wales.



WILLIAM COMAN.

Born County Tipperary, Ireland, 1818.
Died Eurobodalla, N.S.W., 1903.



JOHN GRANT,

Born Inverness, Scotland, 1805.
Died Sydney, N.S.W., 1876.



FRANCIS McMAHON.

Born County Monaghan, Ireland, 1815.
Died Sydney, N.S.W., 1897.













THOMAS CORK.

Born England, 1806.
Died Milton, N.S.W., 1890.

FOUR SPLENDID TYPES OF PIONEERS.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

The following is a list of the names of the chief breeders, and their brands, who supplied Illawarra with a large number of cattle in the years from 1850 to 1870, or for some years prior to the beef Shorthorn craze of 1870 :—

F'Arcy Wentworth	Peterborough	Illawarra	DW
Henry Osborne	Marshall Mount	Illawarra	HO
John Terry Hughes	Terry's Meadows	Illawarra	ITH
David Johnston	Johnston's Meadows	Illawarra	
Towns and Addison	Shellharbour	Illawarra	TXA
George Macleay	Brownlow Hill	Camden	LC
Berry & Wolstanecroft	Coolangatta	Shoalhaven	B&W
The Twofold Bay Co.	Tarraganda	Bega	
John Hawdon	Kiora	Moruya	H 5
William Foster	Narooma	Wadonga River	
T. S. Lomax	The Keelagues Estate	Illawarra	LX
Charles Byrnes	Cadgee and Narregundah	Moruya	CB H
William Campbell	Bergalia	Moruya	
Mrs. Jemima Jenkins	Berkeley	Illawarra	JSJ
William Warren Jenkins	Berkeley	Illawarra	WWJ
William Howe	Glenlee	Camden	
William Coman	Eurobodalla	Moruya	
John Wild	Vanderville	Ficton	WILD
John Edrop	Menangle	Camden	
Michael Hindmarsh	Gerringong	Illawarra	
Andrew McGill	Terry's Meadows	Illawarra	AMC
Evan Evans	Dapto	Illawarra	
John Marks	Terragong	Illawarra	
Henry Eadgery	Bong Bong	Illawarra	HB
Charles Throsby	Bong Bong	Illawarra	TY
Edward Ship'ey	Bong Bong	Illawarra	ES
Ben Boyd	Boydton	Twofold Bay	BEN BOYD (on ribs)

CHAPTER VIII.

ILLAWARRA IN THE SEVENTIES.

At or about the time, say 1865-70, when Mr. Evan R. Evans had the alleged imported bull "Major" he had a roan bull bred by the A.A. Company, of Gloucester, and a roan bull bred by Messrs. Cox, of Mudgee. This roan Cox's bull is supposed to be the sire of several of the bulls known throughout the South Coast. Impressions once formed die away but slowly, and the impressions formed in connection with this Cox's bull were no exception to the rule.

Many of our writers on the origin of the Illawarra cattle seem to forget that it was the custom in the earlier days of dairying to always keep two or three bulls running on the farm at the same time, and as no arrangements were ever made with regard to keeping pedigrees, it has all along been a waste of time and paper to defend the pedigree of many of our best bulls against the statements of a man who was probably watching the performance.

In the seventies Mr. Evan R. Evans made other purchases, as stated elsewhere. He purchased from the A.A. Company, of Gloucester, two bulls—Solon and Balco—and from Mr. Cox, of Fern Hill, Mulgoa, a bull which he called Beaumont. Other breeders—namely, Mr. Robert Hindmarsh, had purchased a bull he called "Coronet" from a Mr. Durham, of Singleton; Mr. George Tate purchased a bull from Messrs. Barnes and Smith, which he called "Napoleon"; and other breeders made purchases of bull calves of which no records have been kept. During these years numbers of heifers were purchased from Hassall & Roberts, of Braidwood, Maddrell of Araluen, Campbell of Bergalia, Foster of Narooma, Comen of Eurobodalla, Byrnes of Cadgee, and from dealers who purchased to suit the markets of the coast, to mate with these bulls, as a rule with a view of improving the milking qualities of the dairy herds. But when Mr. W. R. Hindmarsh bought his Victorian-bred bull (a descendant of the celebrated Duke of Derrimut, bred by Mr. Morton, of Mount Derrimut, Victoria) for £750, Mr. W. W. Ewin purchased the 5th Duke of Brunswick for £1150, and two heifers at 1000 guineas each, they were not buying to breed milkers. Their principal object was to breed stud stock for the Sydney market. This system was carried to such an extent that it was quite a common thing to see South Coast men's names figuring as buyers and sellers among the lists at all the pedigreed stud cattle sales in Sydney. During the seventies and eighties some of the Shorthorn cows on the South Coast were said to have as many as seven calves in one year. Be that as it may, it would be a serious mistake to think the men just mentioned, together with Messrs. W. R. Jenkins, of Berkley, Wollongong, Henry Osborne, jun., of Avondale, Dapto, Francis McMahon and William Wilford, of Ulladulla, used, respectively, such bulls as Butterfly, Alexander, Mariner, and Royal Butterfly for the purpose of breeding dairy cattle. Mariner's pedigree has not been published. He is alleged to have been born at sea and purchased in a bazaar in Sydney. Hence the absence of nationality and pedigree. He was a good dairy bull, nevertheless. As men possessed of business tact, they calculated on the value of the calf being bred as it was from pedigreed stock) worth £50, and as the produce of one of the best dairy cows would only be worth, including calf, about £12 a year, it is easily seen why the cattle boom took such a hold on the South Coast dairymen in the seventies, and why so many of their bulls turned out such failures whenever an attempt was made to use their progeny in any of the dairy herds along the South Coast.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

About this time several well-known cattle breeders on the tableland, seeing that dairy heifers were likely to soon command good prices at the several auction yards, selected Ayrshire bulls from Victoria and New Zealand, and put them with the best sorts of their station cattle. By this means a constant supply of heifers was kept up for disposal to the smaller dairymen by the auctioneers for many years after the cattle boom.

But notwithstanding the rush of cattle, pedigreed and otherwise, to the coast from the Sydney markets and the tableland, there were always to be found a number of dairymen in the Illawarra and Shoalhaven Valley districts who moved slowly but surely, and never lost the quality of their dairy herds. It was these men who saved the situation during the eighties. Bulls from their herds produced the milkers, whilst other bulls were kept for pedigreeing purposes.

It was during the cattle boom of the seventies that the disease termed "coast cough," but afterwards diagnosed "tuberculosis," made its appearance among the coastal dairy herds. It was first noticed on the Berkley Estate, near Wollongong, the property of the Messrs. Jenkins. Mr. W. R. Jenkins had obtained possession of the progeny of Royal Butterfly 6th (18, 757, C.H.B.), imported by Mr. R. L. Jenkins, of Nepean Towers. Shortly afterwards the disease made its appearance, and was peculiar to the low-lying, swampy lands for years before it reached the hilly lands, owing probably to a great extent to the fact that it was on the rich flats where these Shorthorns were first introduced in those years. Another cause of the development and spread of the trouble was that it was customary for those farmers who were raising young bulls and heifers for sale to spend much of their time each day for weeks or even months before sale day washing and scrubbing the young animals in order to make their skirt and hair deceptive to the uneducated buyer or observer.

Since then many causes have been put forth for this disease, each having a certain school of followers. These causes include in-and-in breeding—a system of breeding scarcely understood, and certainly not followed to any great extent on the South Coast. Then we have crossbreeding suggested as the real cause. Certainly if this was the cause there would scarcely be a beast left of any strain in ten years. Then, again, the breeding from unpedigreed sires is put down as the main cause of the disease. If this were the cause of the trouble, why, then, did the bull Royal Butterfly 6th (18, 757, C.H.B.) introduce the disease into the Illawarra district in the first instance? The truth is, had our dairymen persisted in the beef Shorthorns for any length of time, a cow that would give 40lb. of milk per day would soon have become a *rara avis* among their herds. When, therefore, the Herd Book was established, breeders were not satisfied with fair returns; they went for phenomenal ones. The result was that excess in production robbed the dairymen, through the agency of "milk fever" and tuberculosis, of many of their most cherished animals. The real trouble is, therefore to be found in over-production.

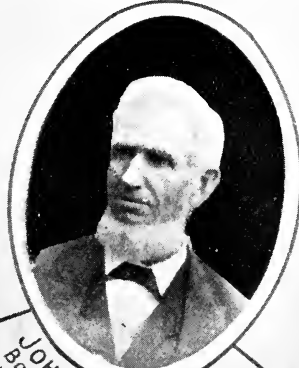
It was about 1878 that Mr. John Farragher, of Kiama, sold out and purchased Greenmount, Candelo. He has previously purchased a pure Jersey bull at the Sydney Exhibition of 1877, which he took to the Bega district, together with a few choice cows. The half-brother of this bull and a few of the cows, which afterwards were purchased by Mr. Farragher from Mr. Henry F. Marr, of Garden Hill, Wollongong. Subjoined is an account of Mr. Marr's cattle, which goes to show that they had been purchased from Mr. Edward Larkin, of Windmill Hill, in 1877:—

Mr. Henry F. Marr, of Garden Hill, Wollongong, writing to the "Illawarra Mercury" in the late part of 1877, says:—"At the present time the attention of 'interested parties' is much given to the neces-

ILLAWARRA IN THE SEVENTIES.



JOHN FARRAKER Esq.
Born Bulli, N.S.W. 1826 Yrs.
Residing South Coast, N.S.W. 83 Yrs.



JOHN COLLINS Esq.
Born Co. Tyrone, Ire. 1820.
Residing South Coast, N.S.W. 68 Yrs.



JOHN KEYS Esq.
Born Co. Tyrone, Ire. 1819.
Died Candelo, N.S.W. 1900.



ROBERT RITCHIE Esq.
Born Co. Tyrone, Ire. 1825.
Died Bega, N.S.W. 1894.



WILLIAM ALLAN Esq.
Born Lincolnshire, Eng. 1834.
Residing South Coast, N.S.W. 49 Yrs.



WILLIAM RIXON Esq.
Born Calhcartt, N.S.W. 1844.
Residing South Coast, N.S.W. 64 Yrs.

A GROUP OF LEADING BEGA SETTLERS.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

sity for improvement in the breeding of dairy cattle, which to a great extent is utterly neglected in the colony (vide 'Sydney Mail' of December 1st). I beg to hand you the following information, which may by you be deemed worthy of mention in your journal:—

"I have recently purchased from Mr. Edward Larkin, of Windmill Hill, near Appin, a purebred Jersey bull, one only of three pure Jersey bulls in New South Wales; also a pure Alderney cow, which has visited the pure imported Jersey bull Sir John. On separate slip I send you copy of the pedigree of my bull, whose half-brother was sold at Exhibition to Mr. John Farragher, of Kiama, for fifty guineas, and who, with my animal and their imported sire Sir John, compose the only trio of purebred Jersey bulls in New South Wales. It is my intention to cross a few of my own picked cows with the Jersey, and next year I may offer his services to the public. Garden Hill, 3/12/77.

"Copy of pedigree of purebred Jersey bull 'Tricolor':—Tricolor, a striped bull, calved June, 1875. Sire, the pure imported Jersey bull Sir John, who took first prize at Sydney Exhibition 1875, and was bred by the Hon. John Baker, Port Adelaide, South Australia, from the choicest animals obtainable in Jersey. Sir John is the only pure imported Jersey in New South Wales, and is the property of Edward Larkin, Esq. Tricolor's dam, Agnes, a pure imported prize Jersey cow, was also bred by Hon. John Baker."

"Copy of purebred Alderney cow's pedigree:—'Fancy Fanny,' light red, 4 years old, by pure Alderney bull, bred by J. D. V. Lamb, Esq., dam Beauty, a pure Alderney cow. (Signed) E. Larkin."

At the time of Mr. Farragher's sale Mr. William Grey, of Kiama, was using a Noble Arthur bull (which cost him £130) in his herd, but he fancied a calf that was just dropped the day of the sale and purchased it. It was by the Jersey bull, and its dam was an Ayrshire Shorthorn cow. The Noble Arthur bull's stock were rank failures in the milk bail; the only milk those animals ever possessed was put into them through their mouth when calves. In due course this crossbred calf grew up, and although Mr. Grey gave but £1 for him, he got, when mated with the ordinary dairy cattle of the district, some of the finest specimens of dairy cattle to be seen, the descendants of which could easily be traced for nearly twenty years since that date.

This is by no means a singular instance in the history of dairying where it can be shown that a bull, with two or more crosses of blood in his veins, has produced very excellent and lasting results, especially when the sire and dam of such an animal has been bred essentially for the same identical purpose, to wit, the dairy.

The Jersey cattle as a breed never obtained a hold in the Illawarra district. No sooner, however, had the "Luicus" blood made its appearance in the Bega district, under the control of that champion breeder, Mr. John Farragher, of Candelo, than it caught on with the dairy farmers, and in a few years the Jersey breed of cattle obtained a firm and lasting hold in that great dairying centre.

It must not be forgotten, however, the part played by the Moruya, Bega, and Twofold settlers in connection with the introduction of beef Shorthorns and Ayrshire cattle during the period under review. As a writer puts it: "One cannot help noticing the great number of fashionably-bred bulls—some of aristocratic lineage—all of breeds that are to be seen in the southern districts."

In the September of 1870, Mr. John Russell, of Croome, Illawarra, purchased in Sydney four two-year-old bulls, viz., "Defiance," bred by Messrs. Barnes & Smith, Dyraba, Richmond River, by Frank

ILLAWARRA IN THE SEVENTIES.

Gwynne, for £50. Defiance's sire, Frank Gwynne, was bred by Mr. Clarke Irving, of Tomki, Richmond River, by Mr. Irving's imported bull Lablache (16, 353, C.H.B.). Duke, bred by Mr. Thomas Lee, Woodlands, Bathurst, by Model Count, dam unknown. Baronet, bred by Mr. Thomas Lee, Woodlands, Bathurst, by Model Count, dam Buttercup, Buttercup by Coronet (14,331), g.d. Lady Emily, by Coronet (14,331), gr.g.d. Daisy, by Grandmaster (14,643)—Violet, by Pirate (imp.)—Quail, by Petrarch (197, N.S.W. H.B.)—Maria, calved on voyage to Australia—Lorina (imp.), by Bachelor (1666). Model Count was bred by Mr. Robert McDougall, Glenroy, Victoria, by Count of the Empire (14,933).

The foundation of Mr. McDougall's herd was laid in the fifties by stock bred by the Circular Head Company, of Tasmania. These two Lee bulls cost Mr. Russell £50 each at Kiss's Bazaar, Sydney. The fourth and worst purchase was Noble Arthur at 56 guineas. Noble Arthur was by Royal Butterfly 6th. The Butterflies were by no means dairymen's cattle, and of the Noble Arthurs much the same thing must be said. Out of these four bulls purchased by Mr. Russell "Baronet" was the only animal worth mentioning. Mr. Russell states that Baronet was the best dairy bull he ever owned. Mr. Henry Fredricks, of Clover Hill, Kiama, rented Baronet from Mr. Russell for two seasons, and bred some excellent stock from him. The writer does not place much importance on cattle pedigrees when submitted for sale by public auction at horse bazaars; nevertheless, Mr. John Russell was too level-headed and practical a man to be easily deceived when purchasing stock of the description referred to herein. Baronet was full brother to Royalty. That being so, he was direct in descent on the dam's side from Middleham and Grandmaster, the bulk of whose stock were of noted milking qualities whenever they were mated with dairy cattle. Baronet was a roan mingled with dark hairs, and had a black muzzle.

Had all the stockbreeders fallen into line about the beginning of the fifties, and kept records of their importations of stock, together with their more important stock transactions, there would not now be much difficulty in tracing out the best strains of any breed of cattle used in building up the herds of this country. As it is, there are several important records either entirely lost or missing. Among these are those of Mr. William Lee, Bathurst, established 1835; the A.A. Company, Port Stephens, established 1830; the Two-fold Bay Company, established 1852. There is another matter which is most confusing to any one trying to trace out a certain strain of cattle used by our dairymen—namely, the number of bulls bearing the same name without having any material relationship to each other. For instance, take the name "Duke." Mr. Henry Osborne, Illawarra, imported a bull named Duke in 1843; Mr. Henry Wren imported a bull named Duke, which he used at Tarragano, Bega, in 1852; Messrs. Pearson Bros., Glenreigh, Clarence River, in 1867 purchased a bull named Duke from Mr. R. McDougall, of Victoria; Messrs. A. & W. Busby bred a white bull named Duke in 1869 by their imported bull Old Michael; Mr. W. J. Dangar, of Neetsfield, Singleton, bred a red bull named Duke from his bull Grand Duke; in 1871 Mr. John Russell (Croome, Illawarra), purchased a bull named Duke from Mr. Thomas Lee, of Woodlands, Bathurst. Thus we have no less than six bulls bearing the name of Duke, all of which are bred on different lines; yet by the continual passing of stock from district to district, the result of cattle sales, &c., breeds were constantly mixing and remixing with each other prior to the establishment of any system of records being kept by many of our breeders.

Records in themselves are only what station managers or dairymen make them. If a fashionable pedigreed bull is getting calves

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

of an unsaleable color, is it not possible to turn him into a secure paddock to be used for pedigreeing purposes only, and put a Devon bull in his place at the stud, as in the case of bulls throwing too many white calves? Instances such as these may be of rare occurrence, but such things have occurred before to-day, and they go a long way to make difficulties for those who wish to place on record the origin of the dairy cattle of either our coast or tableland districts, and at the same time adhere strictly to pedigreed animals. This is not written with a view of upsetting the importance of the records kept by many of the best breeders of cattle in New South Wales. But as there were so many who kept no accounts outside their banking business it was an easy matter for dealers to state in after years that certain young bulls were bred by So-and-So, and no one outside the banking authorities could say nay, it is therefore just as well to state here the true state of things which obtained in New South Wales during the whole of the fat cattle boom which continued through the seventies and eighties.

Another matter which operated on the recent efforts made by some writers to trace the origin of our breeds of dairying cattle was the constant swapping and loaning of bulls that was indulged in very largely in the history of cattle raising throughout the country districts. Then, again, many of the best sires changed ownership several times during their years of usefulness. The bull Major was no exception to the rule, as he was used in the herds of Messrs. Evans, Williams, and Hindmarsh. Had proper records been kept of this bull, no doubt we would have something to show of a definite nature in connection with the mating of cattle and the effects of climate on the progeny of such matings.

It is pretty generally conceded that Major was the sire of Mr. Henry Fredrick's Major II. (although this bull was the first of the two to be named Major). He is also supposed to be the sire of Fox's bull. Yet Major II. and Fox's bull did not resemble each other. Major II. was a bull of good height and great length of body, and of a light roan color, whereas Fox's bull was low-set, deep bodied, of medium length, and a dusty patchy roan color. Major II. sired many stud dairy animals when in Mr. Fredrick's herd, and afterwards in Messrs. Cole Bros.' herd. Fox's bull when mated with a red cow—a Shorthorn-Devon cross (or as they are termed in England a Lincoln-Shorthorn)—produced Dudgeon's bull. Fox's bull was taken as a calf to the Monaro district, and repurchased by Mr. Evan R. Evans, who sold him as a four-year-old to Mr. Fox, of Jamberoo. Again, we have Mr. Peter Quin's bull, bred by Mr. Evan R. Evans, by Major. This bull of Mr. Quin's was of good length and height, and of a light roan color, and was the sire of Boxer. Boxer was the sire of Mr. James Spinks's Musket. Then we come to a bull bred by Mr. Robert Hindmarsh, and taken as a calf to the Braidwood district by Mr. Fred. Hindmarsh, whence he was returned to the Kiama district, and sold to Mr. Gabriel Timbs, of Albion Park, who bred excellent dairy stock from him. This bull was low-set and large bodied, and of a spotted roan color. Like Fox's bull, this animal had to battle for a living on the tableland during its younger days, whereas Major II. and Mr. Peter Quin's bull were reared under those generous climatic conditions such as the rich soils of Illawarra afforded in those years.

As to the breeding of the dams and granddams of these four animals, each is reported to be of pure Durham origin. Nevertheless, if it were possible to bring the four male animals in question, together with their sire, under review, calm Shorthorn critics who were unacquainted with influences of food, soil, and climate environment on young animals, would unhesitatingly declare that,

ILLAWARRA IN THE SEVENTIES.



MICHAEL N. HINDMARSH.
Born Gerringong, N.S.W. 1832.
Residing Illawarra 77 Years.



JAMES MILLER, Esq.
Born Renfrewshire, Scot. 1824.
Died Gerringong, N.S.W. 1894.



GEORGE TATE, Esq.
Born Sydney, N.S.W. 1818.
Died Moss Vale, N.S.W. 1903.



JOHN SHARPE, Esq.
Born Co. Antrim, Ire. 1813.
Died Lismore, N.S.W. 1898.



DAVID L. DYMOCK, Esq.
Born Edinburgh, Scot. 1842.
Residing Australia 47 Years.



SAMUEL W. GREY, Esq.
Born Co. Armagh, Ire. 1823.
Died Sydney, N.S.W. 1889.

PROMINENT MEN IN THE SEVENTIES AND EIGHTIES.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

including Major and downward for several generations, there was distinct evidence of an Ayrshire taint, which has continued with more or less effect throughout.

Now, the contention is that had those who were breeding stud dairy bulls and heifers kept some reliable data of the pedigrees of the animals they were breeding and selling, instead of depending on what is often with some breeders, a treacherous agent—to wit, memory—a valuable lesson in breeding dairy animals would have resulted. Instead of a valuable lesson we have had nothing but disputes as to the actual purity of any of these bulls' breeding, each owner claiming to possess authentic proof that the other fellow's bull was no purer bred than he ought to be. Be this as it may, we have proof, apart altogether from these instances, that the effect on the general appearance and vigor, caused by taking calves from the coast to the tableland, is very marked indeed if the animals are allowed to remain away for two or three years. Nevertheless there is nothing to show that there was not a little Ayrshire blood in all of these bulls under review. In fact, if that peculiar characteristic of the Ayrshire, namely, the "dollar-spot," can be trusted, it was blended in the skin shades of those bulls to a marked degree.

CHAPTER IX.

THE DAWN OF DAIRYING CO-OPERATION.

What may be termed the "Dawn of Unionism" among the dairy farmers of New South Wales commenced in 1862, and has been at work ever since, owing to the actions of Sussex-street agents. The dairymen were constantly complaining about unfair treatment.

In 1864 the grumbling formed itself into a slight rebellion, and one or two farmers seemed disposed to form a union, by which sufficient produce only would be sent to Sydney to satisfy the demands of the consumers. "What are we to do with the surplus?" was the next question. "Throw it over the Sydney Heads," was the reply! The gentleman who made the suggestion and answered the query was Mr. John Colley, of Jerrara Vale, Kiama.

Owing to the fact that butter went up in value during the winter months, when there was a very considerable reduction in quantity with a corresponding rise in quality, acted as a sort of salve to heal the summer sores of the farmers. Be that as it may, very little was done worthy of much notice during the sixties and seventies in the dairying business by way of united action outside of Sussex-street, Sydney. The result was that those who could manufacture good butter under the conditions in which everyone was then placed did so; and those who were unable to grapple with the surroundings went behind.

The conditions of Sir John Robertson's Land Act of 1861 allowed anyone to take up a selection anywhere on three conditions: The area must not be less than forty and not more than 320 acres; the price paid was £1 per acre, 5s. down, the rest in instalments; the selector had to personally live on his selection—at least he was supposed by law to do so. This Act gave opportunities to many of our dairy farmers, who immediately availed themselves of these provisions, and selected land where available throughout the several counties along the southern seaboard, and also on the tableland. These selectors were not slow in converting their lands into dairy farms; and as each additional dairy meant more and more dairy produce, it is easy to conceive how the trouble of the dairy farmers as regards their summer production materially increased accordingly.

In April and the following winter months many of the dairymen used to prepare the butter, which they had salted and packed away in brine casks during the summer when prices were low, in the best possible form, and sent it on to the market when prices went up. This scheme did not by any means improve the condition of the dairy farmer generally; but it goes to show the efforts put into execution by the several dairymen to dispose of a perishable article of commerce to the best advantage, or in other words with the means at their command in the sixties and seventies, and before the invention of dairy machinery.

In 1865, in the month of April, a Mr. Hardy visited Kiama with a view to the purchase of butter for export. He appointed Mr. Mat. Robson as his agent, who purchased fifty-nine casks of butter as a trial shipment, and the following month 105 casks were purchased. Mr. Hardy again visited Kiama in company with Messrs. Hines and Brice, and appointed a Mr. Smith as his agent, and made arrangements to purchase butter each month from 75 to 100 casks till the end of the year. In the June of 1866 Mr. Hardy again visited Kiama, and Mr. Smith purchased considerable quantities throughout the winter months only.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

The following years were very dry, and in consequence there was no great rush of butter. In April, 1869, Mr. Hardy sent a Mr. Brewer to buy for him. Then Mr. Budd commenced buying for a Mr. Griffiths. In May of the same year Mr. John Dymock was on the scene buying for the Melbourne market, and Mr. Robson bought a few casks for a Mr. Allpress, of Sydney.

In 1869 Messrs. John Colley and George Grey commenced shipping butter to various parts on their own account. By some of these shipments fairly good profit was realised, whereas in other instances a loss was sustained, owing to the enormous freight charges and other incidental expenses. In one of Mr. Colley's shipments was a cask of butter for India. By some accident in the address this cask of butter was not landed on its arrival at the port in India, and was returned to Mr. Colley in the following year. On its arrival in Kiama it was examined and found to be in sound condition. It was, therefore, re-shipped to England, and realised 1s. per lb.

In 1870-1 several attempts were made to form butter companies among the dairy farmers, and several small local companies were formed during the seventies. It would appear, however, that when each company carried on for a season or two successfully a serious loss would be sustained, probably on the largest consignment; then a few would have to put their hands into their pockets. In other words, in the majority of cases all unity and enthusiasm died out of the enterprise owing to one-half of the speculators having to pay for any losses that were sustained by the whole. The worst feature of this export business was that the dairy farmers who had the most money often or nearly always reaped the benefits without taking any risks whatever.

The want of ice was much felt in the summer months for reducing the temperature of water for churning purposes. Mr. D. Waugh, a young engineer and a native of the Kiama district, conceived an idea that he could make ice in large quantities cheaply by utilising the Jerrara Falls, near Kiama. His idea was to collect the water as it rushed over the falls, and (by a process which the writer never could grasp) convert it into ice immediately it reached the bottom. How it was to be stored never even reached the stage of conjecture. An experienced Scotch engineer named Jock Taylor visited the scene of operations one morning and carefully surveyed the whole situation. He remarked to his friend, Mr. Waugh, whom he had known from childhood: "David, you may make snow, but you'll ne'er make hail-stains!" The experiment fizzled out, without even the snow or hail-storms, with loss to those who put their money into the company.

In 1877 a patent was granted to Le Feldt and Lentsch for a machine to separate cream from milk by centrifugal force. This first centrifugal separator consisted merely of buckets hung on arms swinging from a central axis. The idea, in the first instance, was obtained by examining the milk which a thoughtless boy was seen carrying by passing it round his body from hand to hand as he walked from the cow bail to the kitchen. When the machine was at rest the buckets assumed a vertical position, but in motion they were thrown out horizontally from the arms. The milk was placed in these buckets, the machine set in motion until the cream was separated from the milk, and when the machine was allowed to come to a standstill the buckets assumed a vertical position, and the cream was removed from the top by a skimmer in the same way as under the old pan setting system.

The idea, however, of having the cream separated from the milk as soon as it was drawn from the cow caught on with the public; and from this simple patent an improved machine consisting of a

THE DAWN OF DAIRYING CO-OPERATION.

revolving bowl or drum in which the separation took place, with arrangements for removing the skim milk and cream without stopping the machine was patented and placed on the market during the next few years. Since then there has been, nothing but new ideas and patents.

In the decade of 1878-88 agricultural societies played an important part in every new development. The dairy farmers did not wander about the country, nor had they the facilities of doing so as we have to-day on the coastal districts. In consequence, much importance was attached to the local shows, and much interest taken in the utterances of intelligent visitors who happened to come among the people on these festive yet highly instructive occasions.

Now, it was in the latter end of the seventies that the idea of co-operation began to take hold of the minds of the dairymen of New South Wales. The best speakers and writers—of which the coastal and tableland districts possessed a good few—were selected for their various duties and sent among the people to form one great co-operative society. Among those who took a prominent part in the movement were Messrs. John Black, D. L. Dymock, John Hanrahan, Samuel Marks, William Grey. Other men of important influence quickly fell in line with the movement, which resulted in the establishment of the South Coast and West Camden Co-operative Company, with Mr. John Graham as its manager, in 1881. It was then anticipated that in the course of but a few years there would not be a commission agent selling butter in Sussex-street. The sequel, however, goes to show that the dream or vision of he who imagined such a thing possible has not yet been fulfilled.

The next important movement was that of the co-operative butter factory system. This also received its first impulse at an agricultural show dinner held in Kiama in the year 1880. At that dinner two gentlemen were introduced by Mr. John Black, namely, Messrs. Barry and Wheeler, with a view of forming a company in Kiama on the American principle of concentrating milk.

Although most of the leading dairymen, acting under certain control, held aloof from the concentrated milk business, it was established at "Omega," Kiama. This was to a great extent due to the personal influence of Messrs. Samuel W. Grey and John Black. Mr. Barry introduced a Mr. Newham from the celebrated factory of Mallo, Ireland. But from the first there seems to have been grave difficulties that never were overcome. It is stated that £20,000 was squandered without much result. Some say the machinery was faulty. But our present experience teaches us that in the absence of refrigerating machinery it was impossible to carry on a work that is so largely controlled by cleanliness, heat, and cold.

The late Mr. T. S. Mort, who was the founder of refrigeration in New South Wales, established the Fresh Food and Ice Company in Sydney, delivered an address at Lithgow, New South Wales, in 1875. To quote from a report of his speech: "He said he had long been anxious to see introduced into the city of Sydney fresh, pure milk at a cheap price. That he thought it was a matter of intense importance, and he should feel very proud if he could succeed in carrying out the scheme he had in view. . . . It was very desirable for the welfare of the rising population that it should be supplied with good wholesome milk. They might rely upon it that not only the physical but the moral element also was concerned in it, and he hoped that those who had the power to join hands in helping him would not fail to do so, in order that he might carry out his plans.

"There was another point that he must not leave unnoticed; that was in regard to the export of provisions. He maintained that this

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

country was destined to become the great feeder of Europe. Before long France and England would look to us almost entirely for their supply of food. How wide is the field of labor may be judged from the fact that the estimated existing yearly deficiency in the annual food supply of the English metropolis alone amounted to no less than 102,000,000lb.; while, if we take the whole kingdom, it reaches the enormous quantity of 3,544,000,000lb., equal to about 70,880,000 sheep. That was the supply of London alone, and when they considered the enormous quantities consumed in other parts of Great Britain and France, they might form some idea of the demand there would be for our produce."

"I feel," said he, "as I have ever felt—that there is no work on the world's carpet greater than this in which I have been engaged. Its object and aim may be summed up in these words: 'There shall be no waste.' That is the sentiment that has kept me nerved to the great battle I have been fighting, which has induced me, single-handed, to risk so large a portion of my children's heritage, and to follow up to the very end the great truth which my friend Mr. Nicolle showed me in the beginning was to be attained. I knew from the hour of our first experiments that the truth was at the bottom of the well, but I had no idea that the well was so deep."

About 1883 the Fresh Food and Ice Company, in conjunction with Mr. T. S. Mørt (who had expended large sums of money in developing the cheese industry at Bodalla, and who had also spent much money trying to develop the milk industry of Sydney during the seventies), imported some Danish separators. This company, as stated, had been working up the milk trade in Sydney. The management, therefore, in conjunction with their milk trade, established a butter factory in Sydney for the manufacture of fresh butter for the Sydney trade. About this time Mr. D. L. Dymock visited England, and when there obtained the sole agency of the De Laval separators for New South Wales. On his return to the colony in 1884 he handed the agency over to Messrs. Waugh & Josephson, of Sydney. Having proved by their Sydney experiment that the manufacture of butter under this new system was in advance of the old methods of dairying, Messrs. Lock and Pateson, of the Fresh Food and Ice Company, journeyed down to Kiama, and after a few months' exertion they succeeded in establishing the Pioneer Dairy Factory at Kiama in 1884—the first of its kind in Australia. It has had as many ups and downs as any other pioneer concern, but it was a great object lesson and an education for those who were to embark afterwards in the same enterprise.

In 1881 a Mr. Henry Harding, a son of Mr. Henry Harding, of Cheddar cheese fame in England, visited Kiama and established a cheese factory on Mr. T. McCaffrey's farm at Jerrara, near Kiama. Mr. Harding was an expert cheese maker, and his system suited admirably the soil and climate of Kiama. The Bega district cheese, however, had the hold on the Sydney market, being long established, and Mr. Harding had to give place to the southern men—not without doing much good in the neighbourhood in which he was located, which is no doubt well adapted for cheese-making.

In 1885 Mr. Dymock succeeded in establishing the Albion Park Co-operative Butter Factory. This gave the dairy farmers between Albion Park and Gerringong a condensed milk factory, a cheese factory, and two butter factories, all established in the course of a very few years.

So long as natural conditions obtained in New South Wales, and our leading men followed agricultural and pastoral pursuits, producing most of their own requirements, everything seemed to move along smoothly. But as soon as the Capital City of Australia began to develop, and the greater portion of our population became centred

THE DAWN OF DAIRYING CO-OPERATION.



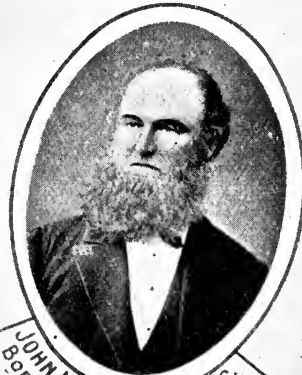
ALEXANDER BERRY, Esq. M.L.C.
Born Fifeshire, Scot. 1781.
Died Sydney, 1873.



THOMAS SUTCLIFFE MORT, Esq.
Born Lancashire, Eng. 1816.
Died Bodalla, 1879.



CAPTAIN CHARLES, M.L.C.
Born Co. Tyrone, Ireland, 1818.
Residing, Sydney.



JOHN MARKS, Esq. M.L.C.
Born Co. Tyrone, Ireland, 1826.
Died Sydney, 1885.



SIR JOHN HAY
Born Shoalhaven N.S.W. 1840
Died Sydney, 1909.



SIR J. H. CARRUTHERS, M.L.C.
Born Kiama N.S.W. 1857.
Residing, Sydney.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

in the city and suburbs of Sydney, the agriculturists and pastoralists soon discovered that the tastes of these non-producing consumers had to be seriously considered. The class of food that would be eaten with a relish by one generation will not suit another generation; hence the question of food supply, with its attendant chain of variations, began to affect the food producers of New South Wales, particularly the Illawarra and Shoalhaven Valley districts, where a large percentage of the fresh milk, cream, and butter was being drawn for the Sydney market supplies in the middle eighties.

It is said that the watchword of progress is "more enlightened utilisation of our resources in every branch of human economy, in the factory, in the municipality, and on the farm." If so, progression in this line in connection with butter factories since 1881 all along the south-eastern coast of New South Wales has been extensive and multifarious. Thousands upon thousands of pounds have been (and apparently it has not yet attained its limit) wasted to please faddists or to comply with the designs of those who were devising schemes for their own ends at the expense of the farmers.

There are many reasons why the old methods of dairying should give place to newer systems, notably the necessity of exporting our surplus foodstuffs. But no reason can be assigned worthy of notice for neglecting the improvement of our cultivation and pasture lands. The criminal neglect, therefore, of our soils must ever remain as a national crime chargeable against those responsible. "The appetite grows on what it feeds." Owing to the final adoption of the factory system of butter making—which may be stated took place when the two Jamberoo factories, Waughope and Woodstock, were opened during the months of October and November, 1887—the business of the farmers were very naturally limited to the production and sale of the raw materials. Beyond supplying the wants of their own families they soon found that they could not afford to enter the markets in competition with the manufactured and finished article. True, many of the more up-to-date dairymen put up a good fight for a few years; but they finally fell in line with the others.

It was not a matter as to whether the factory could make, on an average, better and cheaper butter and cheese than could be produced on the farm dairies, or whether the bacon factory could produce better bacon and hams and more saleable smoked meats than that obtained from the farmer's curing bench and smokehouse. The fact of the matter was the tastes of the consumers at home and abroad caught on to these articles of diet fresh from the respective factories, and that taste has since obtained. Although there is much to be said in favour of the factory system of dairying, there are two important items which never should be lost sight of in connection with the earlier factory methods. For years the milk was carted to the factory from the cow-bails, and after being separated the skim milk was carted back again to feed the pigs and calves of the farm. The pooling of the milk at the factory, and the difficulties of obtaining it at the skim milk vat in even fair condition were numerous and varied. It was, therefore, beyond all doubt the main cause in disseminating disease among herds that had previously been free from disease of any sort whatever.

The second, and not the least important item in connection with the factory system, was the loss, to a great extent, of the pig industry to the dairy farmers. The Danes, however, made great advances in pig feeding and breeding under the factory system. Their system consists in supplying a large proportion of nitrogenised materials in the feeding. This is said to make the fat more solid and better varied with lean, and the bacon from such a system of feeding will not shrink in the boiling.

THE DAWN OF DAIRYING CO-OPERATION.

The next development in connection with the dairying industry was that of mechanical refrigeration. The first to move in this direction was Mr. T. S. Mort, who had become largely interested in dairying owing to his connection with a Mr. Hawdon, who at one time owned the Bodalla Estate, 1835-56. In the year 1872 Mr. Mort imported cattle from the United Kingdom and other dairying countries, including Shorthorns, Ayrshires, Friesians, and Jerseys, which he kept in separate herds. He erected a large cheese factory on the estate, and also an up-to-date bacon factory, and continued to increase the numbers of his cattle until about the mid eighties, when there were about 1200 milkers on the Bodalla Estate, which, together with other improvements, cost £40,000. Mr. Mort did not content himself with being the owner of probably the largest dairying estate in Australia. He commenced experimenting with freezing machinery. His experiments with chilling of milk is one of the most interesting in the history of the development of dairying. Those who are at all acquainted with the action of extreme cold on milk need not be told that it separates the cream from the milk. The experiments which Mr. Mort tried before discovering a simple agitator to counteract this trouble and thus blend all the milk from top to bottom of the milk vats cost thousands of pounds. Then we have the frozen meat and mutton trade, with its gigantic difficulties to be overcome.

In 1886 the Omega (Kiama) Concentrated Milk Company had closed down, and its machinery had been idle for some time, the New South Wales Fresh Food and Ice Company came to the assistance of those most interested, and installed two Danish separators of a capacity of 120 gallons per hour each, and commenced butter making.

The following year, 1887, saw two butter companies established in Jamberoo, with each a capital of £2000 which amounts were subscribed and paid to the credit of each company, named the Wanghope and Woodstock respectively, by the business men and dairymen of that small locality within the short space of six weeks. Three months later the buildings were erected and installed with a separating plant, including four each 60-gallon hollow bowl De Laval separators, churns, butterworker, &c. These two factories proved, with all their shortcomings, the possibilities of the butter factory system throughout Australia.

In 1888 the factory system had taken hold of the great bulk of the dairying population of New South Wales, with the result that factories seemed to spring up like mushrooms. The larger dairymen went in for what was termed private steam power separating plants on the De Laval principle, and converting the cream into butter as usual. This was the forerunner of the creamery system which has since obtained.

Those men who in the past laid the foundations of our dairy herds in Illawarra and elsewhere in New South Wales, together with those who perfected the butter factory system, and later on those who gave us the dairy refrigerator deserve to have their names emblazoned on the scroll of fame, as without these three where would the dairying industry be to-day on the Northern Rivers of New South Wales or Southern Queensland. Without the old Illawarra dairy cow, the De Laval separator, and an up-to-date refrigerating plant, dairying could not possibly have survived the great advancements in dairying which had previously been made in France, Belgium, Germany, Sweden, Denmark, and other countries such as America and Canada.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

THE DEVELOPMENT OF THE DAIRYING INDUSTRY OF NEW SOUTH WALES.

We have ample evidence, if such were necessary, to show that since the foundation of this present Commonwealth, which dates back some 121 years, Government officers have been deputed every year to collect the returns from those engaged in all descriptions of agricultural pursuits. What has become of those returns has been asked over and over again without effect.

That those statistics are of immense value to each State in the Commonwealth goes without showing, yet it would appear they are not available from an official standpoint at the present moment. The fact is that these statistics are rolled up and put away in the archives of Darlinghurst Gaol, side by side with every record that has ever been signed by a Governor or his private secretary from the days of Phillip. It is to be hoped that some future compiler will have an opportunity of inspecting them.

However, be that as it may, the attached is the only records available, and these do not comprise sufficient data to compare the past with the present developments in dairying. In former days nearly every cow in Australia was milked during the summer months with a view of making the calves docile before turning them out on the runs. The butter and cheese made from the milk was often sold in Wollongong, the then centre of the far-famed Illawarra, as Cork (Ireland) butter, packed in Irish perkins. It is said that a consignment of cheese from the western districts of New South Wales was once mistaken on the Sydney market for grindstones of a special quality.

Year.	Dairy Cows in Milk at end of Year.	Butter Made.	Cheese Made.	MILK PRODUCED.	
				Total.	Quantity Used as Milk.
	Number.	lbs.	lbs.	Galls.	Galls.
1888	—	15,550,440	5,687,702	—	—
1889	261,315	17,600,264	4,834,286	—	—
1890	369,023	18,534,130	4,796,567	—	—
1891	343,477	18,362,897	5,506,071	—	—
1892	365,110	21,398,300	5,018,296	—	—
1893	392,579	26,390,844	4,693,104	—	—
1894	438,211	27,359,695	4,820,412	—	—
1895	358,411	23,295,512	2,938,785	—	—
1896	400,183	25,874,277	4,019,844	—	—
1897	409,098	29,409,966	3,937,168	—	—
1898	416,053	31,483,601	3,245,312	—	—
1899	399,327	33,033,881	2,385,987	—	—
1900	420,148	41,479,794	3,558,823	—	—
1901	417,835	39,056,878	3,838,835	122,750,528	22,444,298
1902	351,287	29,950,977	4,148,038	105,742,940	24,457,231
1903	362,429	38,727,107	4,748,176	129,966,059	25,490,112
1904	424,936	53,591,243	4,223,621	158,650,768	23,373,201
1905	442,950	53,040,250	4,625,980	162,918,626	23,417,449
1905	494,820	58,041,137	5,389,345	185,941,230	23,843,558
1907	506,395	60,041,449	4,586,857	183,303,474	24,762,261

Note.—The blank spaces indicate the information is not available.

CHAPTER X.

THE BEGINNINGS OF THE AGRICULTURAL SOCIETIES.

In 1858 the Agricultural Society of New South Wales was reformed, and carried on its operations fairly successfully till the January of 1868, when the council deemed it expedient to enlarge its operations, and in order to do so effectually the seat of the society was removed to Sydney. With the co-operation of the Mayor and aldermen of the city, the Prince Alfred Park and Exhibition Building were rented for the purpose of holding annual shows, which at once became a national institution, attended and looked for not only by all those who had the pastoral, agricultural, and industrial progress of the colony at heart, but also by exhibitors from other colonies in Australasia and countries abroad.

In 1877 there was a great display of Shorthorn cattle. This may be judged by the fact that Mr. W. W. Ewin, of Ulladulla (South Coast) had to be content with highly commended for 5th Duke of Brunswick, bred by Messrs. Robertson Bros., Colac, Victoria and purchased by Mr. Ewin in 1875 for £1150 and resold by Mr. Ewin to Mr. Woodhouse, of Mount Gilead, Campbelltown, for £1200 in 1878. As a bull to get dairy cattle the 5th Duke of Brunswick was a pronounced failure. The circumstance is merely mentioned to show that some of the South Coast dairymen were spirited buyers at the Sydney Exhibitions in the seventies, although those who got dabbling with the beef animals, with very few exceptions, soon scattered their dairy herds to the winds, as a series of droughts quickly followed this cattle boom, and soon the bones of many a costly Shorthorn were left to bleach in the paddocks between Wollongong and Twofold Bay, with a few very rare exceptions indeed.

In 1879 the great International Exhibition was held in Sydney, amidst great opposition from a section of the community. There were, however, strong men on the council of the Agricultural Society, who sooner than see the honor of the institution suffer a rebuff from men of small ideas, set to work to subscribe £12,000 to carry out the design of the committee of management. Among those who took a prominent part in subscribing the necessary funds were Sir P. A. Jennings and Sir John Hay.

Sir Patrick A. Jennings at that time had large pastoral interests in New South Wales and Southern Queensland, and Sir John Hay—who, by the way, had no connection with the late Sir John Hay, of Coolangatta—was largely interested in pastoral pursuits in Southern New South Wales. They were men of honesty of purpose and sterling worth, who were ever ready to die poor rather than to be found associated with institutions that would go back on their promises. To those two gentlemen was due much of the credit of the past and not a few of those more lasting developments of the R.A.S. of New South Wales during the periods under review.

The first coastal district in New South Wales to move in connection with the formation of an agricultural and horticultural society was Wollongong.

The first meeting held in Wollongong to establish the Illawarra Agricultural Society was held in the public schoolhouse, at that time unoccupied, in Crown-street, Wollongong, on the 15th April, 1844, and adjourned to the 21st, when a society was formed, to be called "The Illawarra Agricultural Society." E. F. Wood, Esq.,

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES

of the Keelgues Estate, was elected first president, and R. M. Westmacott, Esq., of Bulli, who was at one time A.D.C. to his Excellency Governor Richard Bourke, was appointed hon. secretary. The following gentlemen were members of the committee:—Messrs. Gerard Gerard, J.P., Chas. Throsby, Smith, Captain Sheaffe, Messrs. Michael Hindmarsh, Edward Palmer, James Mackay Grey J.P. James Shoobert, J. R. Cummins, Dr. Menzies, Messrs. Miller, Way, and Henry Osborne, J.P. Drs. John and Alex. Osborne, J.P., Dr. O'Brien, Captain Addison, Captain Plunkett, and Messrs. George Brown, James Robb, W. Warren Jenkins. The first show was held in a house next to where the telegraph office stands, on Thursday, 27th January, 1845. The exhibits were good, but the room being too small, much inconvenience was felt.

The first ploughing match took place on 12th January, 1845, in Mr. George Brown's paddock at Dapto. The first prize valued at £2, was won by Mr. Thomas McKenzie, of Jamberoo. His neighbour, Mr. Hugh Boyle, drove the bullocks. There was a large attendance, and everything passed off well, according to report.

Since the society was first established a show was held annually for many years, although at times under great difficulties. Still, by the perseverance and assistance of a few of its members it was kept afloat, and is the oldest established agricultural society in the colony, with the exception of the Parramatta A. and H. Society, now known as the Sydney R.A.S. Amongst its most prominent and staunch supporters under all difficulties in after years may be mentioned the names of Messrs. Chas. T. Smith, George Waring, George Hewlett, H. J. Marr, S. D. Lott, J. R. Cummins, Evan Evans, E. R. Evans, Andrew McGill, George W. Brown (hon. secretary), W. Kirton, J. E. Wright, A. McKenzie, D. Aitken, Joseph Ritchie, and Robert Howorth.

In connection with these early shows in Wollongong the cattle were exhibited in the market square opposite Elliot's Farmers' Hotel. The dairy cattle, including the progeny of Mr. Henry Osborne's imported animals, which were exhibited on the first occasion for show purposes, were admired by all who understood them. The same was said of the horse stock, which included some very valuable animals, and were paraded in the market square, which was fenced up for the occasion temporarily.

The Kiama A. and H. Society was established in 1847 by the efforts of Mr. Nicholas Craig, of Kiama. He induced Mr. Hannibal Hawkens Macarthur to become patron of the new society. Dr. Robert Menzies, J.P., of Jamberoo, Mr. James Robb, of Kiama, and Mr. Michael Hindmarsh, of Gerringong, who had been on the committee of the Wollongong Society, joined the movement, and Dr. Menzies was the first president of the society. The first show was held in what was known as Mr. William Gard's brewery, which was partly built, and stood on an allotment of land adjacent to the present Freemason's Hall, between Collins and Shoalhaven streets.

Mr. James Waugh was the first secretary, but as the position in those days was an honorary one, the acting secretaries mixed up their papers with their usual everyday business transactions, and were either destroyed or lost. The writer is therefore largely indebted to the late Mr. Nicholas Craig, of Kiama, and Mr. John Brown, of Brownsville, for much information on the matter.

After a few years (1857) the Dapto Agricultural Society took the lead, with Mr. John Brown as hon. secretary, and we find newer men kept coming on the scene until 1860, when quite an array of dairymen put in an appearance. It was at the Dapto Show in 1860 that Mr. Andrew McGill exhibited his famous dairy Durhams

THE BEGINNINGS OF THE AGRICULTURAL SOCIETIES.



THE PAST.
First Presidents of South Coast Agricultural Societies.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

"Scotch Jack" and "Queen II." Mr. Evan Evans also had on exhibition stock from his red Lincoln bull Nonsuch. These were essentially dairy cattle.

In 1863 we find the Berry Estate establishing a show, which was to be held annually in different centres of the estate. The late Mr. Henry Gordon Morton, the manager of the estate, was first president. It was called the Shoalhaven Estate Show. At the third show in 1866 connected with the estate, Mr. John Boxsell exhibited what was termed a very perfect Shorthorn bull, which was the sire of Mr. George Tate's "Boxsell." These shows were carried out very successfully until they merged into the Shoalhaven A. and H. Society, as we now understand it. But in those days the cattle of the Shoalhaven district were mostly descended from the Berry and Wollstonecraft famous Jindyandy herds of dairy cattle, and comprised all breeds.

The Kiama A. and H. Society, which had been first established in 1847 and allowed to die out in the fifties, and resurrected in 1857, to be buried again after a few years with disastrous results, was re-established on a sound basis by the residents of the district, including Mr. John Black and Mr. Joseph Weston, proprietor of the "Kiama Independent" in 1866. During part of the early sixties Mr. Robert Perrott became president of the Kiama A. and H. Society, with Mr. William Irvine, a one-time Kiama auctioneer, as secretary. The reason of the Kiama shows dying out in the fifties was the "gold fever" that set in and drew the attention of many of the best of our cattle men to gold digging. Then, after being established again in the latter part of the fifties by Mr. Robert Perrott and Mr. William Irvine, the pleuropneumonia set in among several of the dairy herds, and no one felt disposed to risk their stock away from their own farm. At this show, 1866, Mr. George Tate took first prize with his bull Boxsell, bred by Mr. John Boxsell, of Berry; and Mr. Evan R. Evans won second prize with Major. Mr. Andrew McGill took first with his celebrated Mary Queen of Scots, and Mr. Henry Fredricks won second prize with a cow of the Osborne and McGill strains. Mary Queen of Scots was said to be the best cow ever exhibited in Illawarra.

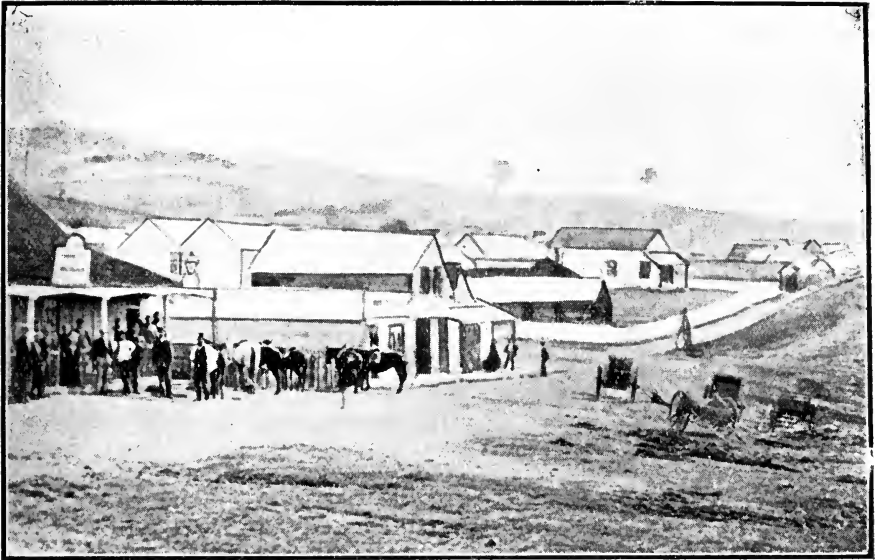
In 1868 the first Agricultural and Horticultural Show was held in Ulladulla. Mr. John Miller was the first president. Mr. Miller had previously resided at Gerringong, being one of the well-known Miller Bros., of that place.

In 1866, however, a show was held at Broughton Creek, and at that show Mr. John Boxsell exhibited a very handsome Shorthorn bull. He was described as being a beautiful roan, with long square hips, and possessed a magnificent head, adorned by a pair of matchless eyes. This bull obtained first prize. This fine animal was bred by Mr. Robert Lowe, of Mudgee, and was by his imported bull Middleham (16, 562, C.H.B.). Mr. Boxsell at that time had a very excellent herd of dairy cattle, principally of the HO brand (Henry Osborne) strain, which he had obtained from a Mr. Elliot, of Mount Pleasant, Kiama. Needless to say, Mr. Boxsell sold many young bulls, the result of that show in 1866.

In 1867 a small quantity of the sugar that was manufactured by Mr. James Robb, of Riversdale, Kiama, was forwarded by Mr. John Colley, of Jamberoo, to his brother-in-law, the Rev. George Mackie, of Melbourne, Victoria, and was awarded honors at the Melbourne Exhibition of 1867.

At the Kiama Show the same year Mr. George Tate took first and Mr. Evan R. Evans second prize for bulls. Mr. Andrew McGill took first and Mr. Henry Fredricks second prize for cow.

THE BEGINNINGS OF THE AGRICULTURAL SOCIETIES.



KIAMA IN 1869.

Taken from Storm Bay, showing Mr. George Adam's Steam Packet Hotel, together with the Show Shed and Court House.



FORTY YEARS LATER : KIAMA IN 1909.

Taken from Storm Bay, showing Mr. John McCaffrey's Brighton Hotel, the Post and Telegraph Office, and Railway Line.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

In 1867, at an important sale in England of purebred Alderney cattle, fifty-seven cows averaged 45 guineas each, twenty-nine two-year-old heifers averaged 53 guineas each, and twenty-three one-year-old heifers averaged 42 guineas each. It is said that it was this sale and the subsequent Press reports which caused the first boom in Channel Island cattle in England.

Much the same types of cattle, and cattle of similar breeds and strains, were exhibited in the Illawarra district, and practically by the same exhibitors, during the following years of 1868 and 1869, with the addition of Mr. Hugh Colley, of Longbrush, Kiama, who won first prize during those years in the Ayrshire class with a very handsome black and white Ayrshire bull bred by Mr. James Robb, of Riversdale, Kiama, from the black and white imported bull.

In 1870 a decided change took place in the class of stock exhibited in Kiama and elsewhere. It was the dawn of the Shorthorn beef craze, which never should have been tolerated at cattle shows in what was essentially then the centre of the dairying in New South Wales. The Kiama Society broke away from the old faith, and gave its best prizes to beef Shorthorns. Just imagine the change that took place in the few short years that followed. In 1875 we find Mr. W. R. Hindmarsh's 6th Duke of Derriment, a bull bred by Mr. Morton, of Mount Derriment, Victoria, which cost £750, carrying off all the honors, and Mr. William James' dairy bull, bred purely for dairy purposes, being classed as a crossbred. If we turn to the Ulladulla A. and H. Society from 1875 to 1878 we will find Mr. W. R. Hindmarsh's brother-in-law (Mr. W. W. Ewin) 5th Duke of Brunswick (bred by Messrs. Robertson Bros., of Colac, Victoria), for which he gave £1050, winning all the prizes, and yet Ulladulla was, and is now, essentially a dairying district. Why was it done? Simply because there was money in these Shorthorns at the time. The Duke of Derriment's heifers, without a single exception, would not, because they could not, feed their own calves. Young animals of this strain were reared on foster mothers of the old dairy type, and the real dairy calves were killed to make room for these animals that were worse than worthless for the dairy. The committees of the several agricultural societies lent themselves to this craze, very likely thinking that when the boom was over they could revive very soon again their old breeds of dairy cattle. But the sequel goes to show that only those dairymen who held on to the old breeds were successful in the dairy cow tests that were established late in the seventies to counteract the beef breed craze in the early seventies. That is to say, if we take the good strains that were to the fore in 1867, those strains with very few exceptions were to the fore in the tests of 1879-1883, which goes to prove that the beef Shorthorns were, with rare exceptions—the cry-back which accidentally dropped into the hands of a practical dairymen—a ruinous investment for dairymen. Of these we can only enumerate about six out of hundreds that we have seen. The idea of getting back to the old breeds and strains by using the Ayrshire as a cross has not been successfully carried out in many instances. At least there has been a very considerable number of failures to the very few successes. The repeated failures caused many excellent dairymen to drift into herds composed of pure Ayrshires and Jerseys.

In 1879 the Kiama Agricultural Association offered prizes of £6, £5, £4, £3, and £2 respectively for the five best butter producing cows on home pasture. The following is the result of the competition:—

Cole Bros.—Date of Test: 28th February, 1879, till 6th March, 1879.

Weight of milk for week: 420½lb. Weight of butter: 18lb.

THE BEGINNINGS OF THE AGRICULTURAL SOCIETIES.

- 4 oz. Nature of feed : Grazed in paddock of rye grass, and fed with broadcast corn.
- Cole Bros.—Date of test : 19th till 25th May, 1879. Weight of milk for week : 309lb. Weight of butter, 14lb. 10 oz. Nature of feed : Grazed in paddock of rye grass, and fed with sorghum.
- Cole Bros.—Date of test : 27th June, 1879, till 30th July, 1879. Weight of milk for week : 325½lb. Weight of butter : 12lb. 13¼ oz. Nature of feed : Grazed in paddock of rye grass, and fed with green oats and caten hay.
- Chas. Price, Jun.—Date of test : 19th till 25th July, 1879. Weight of milk for week : 262lb. Weight of butter, 17lb. 1¼ oz. Nature of feed : Grazed in paddock of rye grass, and fed with corn and hay morning and evening.
- William Brown (Kangaloon).—Date of test : 23rd till 29th July, 1879. Weight of milk per week, 290½lb. Weight of butter : 14lb. 8 oz. Nature of feed : Grazed on green oats and rye grass, and housed at night, weather being rough during week of trial.
- Chas. Price, Jun.—Date of test : 9th till 15th October, 1879. Weight of milk per week : 359lb. Weight of butter : 18lb. 3 oz. Nature of feed : Grazed in paddock of rye grass, two hours morning and evening in paddock of green barley, and fed twice a day with green corn.
- H. Fredericks.—Date of test : 1st till 7th November, 1879. Weight of milk per week : 378lb. Weight of butter : 14lb. Nature of feed : Grazed in grass paddock. No artificial feed.
- H. Fredericks.—Date of test : 29th November, 1879, till 5th December, 1879. Weight of milk per week : 357lb. Weight of butter : 16lb. 8 oz. Nature of feed : No artificial feed.
- W. Walmsley.—Date of test : 1st till 7th December, 1879. Weight of milk per week : 391lb. Weight of butter : 18lb. 4 oz. Nature of feed : No artificial feed.
- Cole Bros.—Date of test : 5th till 11th December, 1879. Weight of milk per week : 341lb. Weight of butter : 12lb. Nature of feed : Grazed in paddock of rye grass and rib grass.
- John Carberry.—Date of test : 22nd till 28th January, 1880. Weight of milk per week : 340½lb. Weight of butter : 14lb. 8¼ oz. Nature of feed : Fed on bran mash, boiled corn, milk, hay, and green corn.

In November, 1883, the Association's Dairy Herd Book was established under rules previously prepared, one of which defined that the animals entitled to a place in the Herd Book "shall be any cow that has produced at least 12lb. butter or 350lb. of milk in one week ; the progeny, male or female, of all cows qualified as above for a place in the Herd Book ; and any bull, four of whose progeny have passed the required test." Another of the rules required that tests for the above purposes should take place in the same locality, the object being to place competing animals on an equal footing.

The following extract from the Herd Book gives the result of tests conducted on Mr. N. Craig's farm, Jerrara Park, near Kiama:—

- Hugh Colley, Jun.—Date of test : 12th to 19th November, 1883. Weight of milk for week : 419lb. Weight of butter : 18lb. Nature of pasture : Rye grass and clover. Weather : Strong westerly winds for some days, remainder of time hot and dry.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

- Hugh Colley, Jun.—Date of test : Same as above. Weight of milk for week : 352lb. Weight of butter : 15lb. Nature of pasture : Same as above. Weather : Same as above.
- Cole Bros.—Date of test : 15th to 22nd November, 1883. Weight of milk for week : 343lb. Weight of butter : 13lb. 4 oz. Nature of pasture : Same as above. Weather : Windy and hot.
- Cole Bros.—Date of test : Same as above. Weight of milk for week : 293lb. Weight of butter : 12lb. Nature of pasture : Same as above. Weather : Windy and hot.
- Jno. McCaffrey.—Date of test : 17th to 24th December, 1883. Weight of milk for week : 289lb. Weight of butter : 14lb. 4 oz. Nature of pasture : Same as above. Weather : Excessively hot and windy for three days out of seven.
- William Grey.—Date of test : 1st to 8th February, 1884. Weight of milk for week : 300lb. Weight of butter : 12lb. 8 oz. Nature of pasture : Grass (dry), supplemented with broadcast corn. Weather : Close and dry.
- Hugh Colley, Jun.—Date of test : 24th to 31st January, 1886. Weight of milk for week : 266lb. Weight of butter : 12lb. 4 oz. Nature of pasture : Broadcast corn. Weather : Windy, hot and dry.
- J. T. & E. Cole.—Date of test : 1st to 7th June, 1886. Weight of milk for week : 256lb. Weight of butter : 12lb. 12 oz. Nature of pasture : Grass pasture only. Weather : Cold.
- Hugh Dudgeon.—2nd to 9th December, 1886. Weight of milk for week : 301lb. Weight of butter : 12lb. Nature of pasture : Same as above. Weather : Hot, but moist.
- Spinks Bros.—Date of test : Same as above. Weight of milk for week : 312lb. Weight of butter : 14lb. 10 oz. Nature of pasture : Same as above. Weather : Same as above.

Note.—The fact of only one cow having been sent to the testing farm in 1884, and none in 1885, is due to the extreme drought that prevailed during those years.

In the Kiama Association's prize list for 1885-6, the following prizes were offered, viz.:—For cow giving the largest quantity of milk in 24 hours, £10; second ditto, £8 8s.; third ditto, £5; fourth ditto, £3 3s.; fifth ditto, £2 2s. Best milking heifer under 3 years old, £2 2s.; second ditto, £1. In both classes competing animals had to be milked three times within twenty-four hours, in the presence of two members of the committee, the second and third milkings only being weighed.

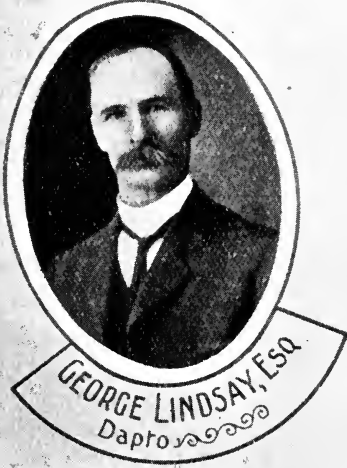
The result of the competition between the prize winners was as follows:—Cows : Mr. H. Fredericks' cow, 53lb.; Mr. H. Dudgeon's, 53lb.; Mr. H. Colley's, 51½lb.; Mr. John Lindsay's, 51½lb.; and Messrs. James Bros., 49½lb. Heifers : Mr. James W. Cole's heifer, 44½lb.; and Mr. H. Fredericks', 39½lb.

In 1886 the association offered similar prizes to the above, under somewhat altered conditions, and the following results were obtained:—

John Lindsay.—Color of animal : Red. Date of test : 9th January, 1886. Weight of milk in 24 hours : Morning 26lb., evening, 25½lb., total 51½lb. Pasture : Grass, sour milk, cracked corn and bran.

John Lindsay.—Color of animal : Light roan. Date of test : 9th January, 1886. Weight of milk in 24 hours : Morning 22lb.,

THE BEGINNINGS OF THE AGRICULTURAL SOCIETIES.



THE PRESENT.

Some of the Presidents of South Coast Agricultural Societies in 1908

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

- evening 22½lb., total 44½lb. Pasture : Grass, cracked corn and bran.
- John Lindsay.—Color of animal : Dark red. Date of test : 9th January, 1886. Weight of milk in 24 hours : Morning 21lb., evening 21lb., total 42lb. Pasture : Grass, cracked corn and bran.
- Daniel Boyd.—Color of animal : Roan. Date of test : 5th May, 1886. Weight of milk in 24 hours : Morning 30½lb., evening 28lb., total 58½lb. Pasture : Rye grass.
- Daniel Boyd.—Color of animal : Red. Date of test : 9th June, 1886. Weight of milk in 24 hours : Morning 27lb., evening 22lb., total 49lb. Pasture : Grass paddock.
- Robert Miller.—Color of animal : Red. Date of test : 2nd October, 1886. Weight of milk in 24 hours : Morning 26lb., evening 29lb., total 55lb. Pasture : Clover and rye grass.
- H. Fredericks.—Color of animal : Red. Date of test : 22nd October, 1886. Weight of milk in 24 hours : Total, 52½lb. Pasture : Clover and rye grass .
- James Sharpe.—Color of animal : Roan. Date of test : 23rd November, 1885. Weight of milk in 24 hours : Morning 27lb., evening 25½lb., total 52½lb. Pasture : Clover and rye grass
- James Sharpe.—Color of animal : Red and white. Date of test : 30th December, 1886. Weight of milk in 24 hours : Morning 27lb. 14 oz., evening 27lb., total 54lb. 14 oz. Pasture : Clover and rye grass.
- James W. Cole.—Color of animal : Light roan. Date of test : 28th January, 1887. Weight of milk in 24 hours : Morning 31½lb., evening 28lb., total 59½lb. Pasture : Clover and rye grass.
- *Hugh Colley, Jun.—Color of animal : Light roan. Date of test : 27th November, 1886. Weight of milk in 24 hours : Morning 17½lb., evening 17½lb., total 35lb. Pasture : Clover and rye grass.
- *Robert Miller.—Color of animal : Light roan. Date of test : 20th October, 1886. Weight of milk in 24 hours : Morning 18lb., evening 18½lb., total 36½lb. Pasture : Clover and rye grass.
- * Heifers under 3 years old.

PART II.

THE ORIGIN AND BREEDS OF CATTLE.

CHAPTER I.

THE ORIGIN OF CATTLE.

Professor Boyd Hawkins, as the result of his investigations as to the origin of British breeds of cattle, believes the two principal stocks from which all breeds are descended are undoubtedly (1) the *Urus*, an animal wild in the forests of Europe later than the days of Charles the Great, but since then extinct in the British Isles; and (2) the *Pos Longifrons*, or "small Celtic Short-horn," an animal which "never was aboriginally wild in Europe." Both were probably domesticated in Asia and in parts of Europe.

As it has been generally conceded to the Celts the honor of domesticating the majority of the British breeds of domesticated cattle, it may not be out of place when endeavouring to explain the origins of our dairy stock to explain also the origin of the Celts, who have tenaciously clung to their cattle as being among the most cherished of their earthly possessions, since they were all liberated from the "Ark." Without, however, rushing back to prehistoric ages for our information, we can conclude that the Romans knew and understood the Celts. The Romans even knew that the Scots were Celts, and classed them rightly with the Celts of France (Gaul) and Spain, and, with prophetic foresight, built the wall running from the Forth to the Clyde almost exactly on the march or boundary of modern Celt and Saxondom. As a matter of fact, the Celtic race proper is of Indo-Persic origin, and it is certain that it was from this great source that the Celts of Scotland, Ireland, Wales, and Cornwall in Great Britain, and the Celts of France and Spain are derived.

"Blood is thicker than water" means a deal more than mere words to the student of history, whether he be dilating on the breeds of cattle or the races of mankind. Schlosser gives four leading subdivisions of the great Indo-European or Indo-Persic family, the parent stem of the Celtic race:—(1.) The Armenian, whose seat is in the Caspian, and whose part in history has hitherto been small. (2.) The Scythian race, overspreading the vast regions of Eastern and North-eastern Europe and of Central Asia to the confines of the Mongolian countries. (3.) The Pelasgic race, diffused in the remotest ages through Asia Minor, the Aegean Islands, Greece, Italy, and other parts of Southern Europe, and the mother race of the Greek and Roman peoples. (4.) The Indo-Persic race proper, stretching in Asia from the Caspian to the Bay of Bengal; and the parent in the west of the two great modern races, the Celts of Gaul, Britain, Spain, &c., and the Germans of Central Europe and the Scandinavian Peninsula."

The students of race and history have here a splendid field for the study of the flux and reflux of blood influences and temperamental influences, all the elements, in short, that go to influence the making of history of man and beast. Out of this great kaleidoscopic race and environment folk-cauldron the Irish and Scottish Celts have emerged with their breeds of cattle, sheep, horses, and other domesticated animals into the highest order of civilisation.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

In the earlier days of the development of Australia we must treat the subject of its settlement different to that of any country under the sun. When Captain Phillip landed on these shores he did not contemplate meeting with any opposition from the original inhabitants — nor did he. He had no intention of taking up his abode in this country. He therefore left England without having on board his tranships any cattle beyond those brought out by the officials for private and domestic purposes. Consequently, when he had set out to sea with his cargo of sorrow he had ample time for reflection. He then repented over his neglect to see that provision had not been made in England for a supply of stock, which are so necessary in the establishment of new colonies. He therefore commanded a number of the tranships to call at the Cape of Good Hope and obtain a consignment of stock, including cattle, horses, sheep, pigs, and poultry. The cattle taken on board were mostly bullocks for hauling purposes, and were found of great value in forming the settlement afterwards. Subsequently it was found necessary to import more cattle from the Cape of Good Hope, India, Bengal, Madagascar, and St. Helliers.

Now, on close inquiry, it can be seen that the cattle then imported into New South Wales were identical with the "Bos Longifrons" from which Celts evolved the majority of the present British breeds of domesticated cattle. These animals were termed "Buffaloes" by the early writers, without an attempt of any sort to describe them. It would not be possible to-day to give a description of them were it not for the records kept by a few of the old pioneers who understood the breeds of cattle used by the people of India, the Cape of Good Hope, and other places.

The Hausi or Hissar cattle of India are described as follows:— "They are of medium height, their heads are broad, necks short, humps high, hips broad, and hindquarters square; they carry their heads erect, and have long curved horns, inclined backwards, and thin long tails; they are of great substance, and have long bodies, deep wide chests, and massive and rather short legs, fairly apart to support the carcass. The bullocks are very large and strong, and draw great weights and heavy ploughs, but are not so fast as the bullocks of other breeds. They are generally of a nice white color, but sometimes red, black, brown, or piebald ones are found. They are handsome in appearance, and give very rich milk."

The Nagourie are said to be natives of Nagpore, in the Central Provinces in former days. These cattle are like the "Hausi" in appearance, but they give milk for a much longer period.

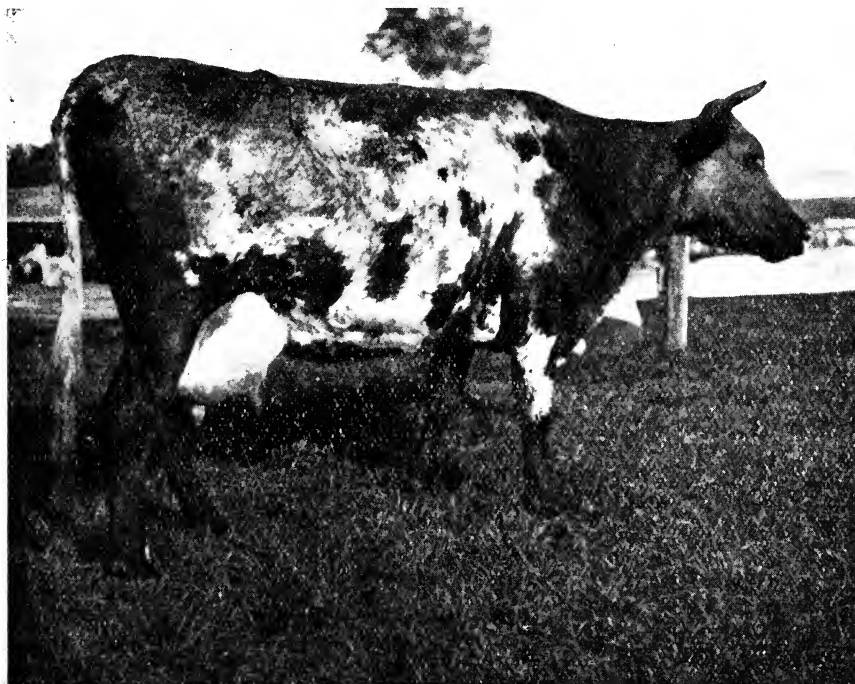
The Nellore breed belongs to the Madras Presidency, and have long been celebrated for its milking qualities of the cows and the great strength and endurance of the bullocks. The "Nellore" is generally recognised by its form and horns. The horns are hardly ever longer than from 3in. to 6in., and are inclined outward, tapering to a blunt point. This animal has a dull countenance and large, prominent, heavy-looking eyes. Its face is short, and its forehead and muzzle broad: its ears are large and lapping; its eyes, hoofs, and tail tuft are black; it carries its head erect, and has a short stout neck rising over the withers into a huge hump, which frequently inclines to one side; its back is short and straight; its chest is fairly deep and wide; and its carcass compact and solid looking, with heavy dewlaps; its legs are clean and massive, straight and fairly set apart to support the body; its skin is fine, and covered with soft short hair. The prevailing color is white.

The Cape of Good Hope cattle were simply offshoots of these breeds, but the nature and condition of the country was to a great extent responsible for their ungainly looks and physical deterioration. The Bengal and Madagascar cattle on the other hand were larger and better developed, and many of the animals imported here were crossed with one or other of the British breeds, which improved them much

THE ORIGIN OF CATTLE.



Cow, Fuchsia. Color : Light Roan.
Bred by and the Property of Mr. E. J. Marks, Terragong, Jamberoo, N.S.W.



Cow, Betsy. Color : Roan and White.
Bred by and the Property of Mr. E. J. Marks, Terragong, Jamberoo, N.S.W.

(For further particulars see Appendix.)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

in appearance and quality. The pasture of New South Wales suited these animals, and when the cows were crossed with Ayrshire bulls of good quality it was surprising to see how the hump on the shoulder and the heavy dewlap disappeared. In a few generations the progeny of these "Bos Longifrons" cows assumed the appearance of neglected Jerseys. This led many of the old New South Wales native-born to exclaim when they saw the first Jersey cattle on exhibition thirty or forty years ago, "Many a score of those bulls were to be found in the ranges when we were boys." These native cattle had a variety of color, and it would be interesting to follow the varied descriptions given of the lost, stolen, or strayed animals of the breed given in the "Police Gazette"; black sides with white faces, cream color, piebald, grey and white were very common descriptions. They were to be found in all the settled districts throughout New South Wales until the beginning of the forties, when they gradually gave place to the more fashionable breeds of Europe. A Mr. William Wilson, who lived at Fairy Meadow, near Wollongong, and afterwards at the Five Islands, had one of these bulls in 1835. Mr. Wilson called the animal Punch. His color was described as cream, and by all accounts was recognised as a valuable animal by the small settlers around that part of the district, as a fee was charged for his service. This bull was afterwards stolen from his owner and never returned.

It would probably have been extremely interesting, as well as instructive, to our present-day scientists had the population of Australia, with its flocks and herds as they existed in 1807 been cut off from the outer world, and the higher intelligence been thus cast on its own resources to work out a destiny for a future Australian nation. We do know, from the knowledge obtained from those who have studied the black population of Australia that they are the descendants of a higher intelligence. We know, however, that the crossbred buffalo cattle that escaped from their keepers shortly after being landed by Captain Phillip soon found their way into good country at the "Cowpastures"—now known as Camden. They increased and multiplied, and eventually formed themselves into groups, each with a warrior bull at its head. They soon drifted back to their semi-aboriginal shapes and habits. They drove the blackfellow out of the locality, and it is said that no blackfellow could be induced to go near them. The spears, boomerangs, and waddies of the blacks prevailed not when an old bull was in the vicinity.

These wild cattle, as they were afterwards called, defied for years capture by armed bodies of whites with three successive Governors and the civil and military officers at their head; in fact, these wild cattle were never captured; they simply drifted away in small mobs when disturbed into the mountain fastnesses, and the gorges and valleys adjacent thereto provided them with food and protection until they became a source of annoyance and a pest to the smaller settlers, whose crops were constantly in danger of being destroyed by their nightly visitations. The sawyers and timber-getters used to shoot them—they of course shot more than "buffaloes" in those days—and the station holders used to offer bushmen £1 for the horns and part of the skull of all the bulls. By this means the young females were crossed by good bulls, and the progeny converted into profitable animals. Therefore it may be truthfully stated that the blood of the cattle of New South Wales was in many instances largely impregnated with the blood of these "Longifrons" right up to the forties and fifties; and it does not appear from the records kept that an infusion of this "Longifron" blood is objectionable, the reverse is the more probable.

"Looking," says an eminent authority, "at the great diversities which present themselves in the different races of the bovine family, a natural curiosity prompts us to inquire whether they are one species: and whether, on the assumption that they are one species, they have sprung from the same stock, and spread over the earth from some

THE ORIGIN OF CATTLE.

common centre in the company of man ; or whether they have been called into existence, either contemporaneously, or at different epochs, according as the different parts of the earth became fitted for their reception, and independent of human influence. So far all writers of note are agreed the majority at least of our domesticated cattle are of Eastern origin, living under man's subjection ever since.

If by species we understand animals possessing certain characteristics in common, which we term specific, and having the power, which we see them possess, of reproducing animals having the same characters, there can be no difficulty in admitting that all the bovine races, in so far as they have yet been examined, are of one species.

If, however, we adopt the hypothesis of one centre of dispersion for all the bovine races, we must suppose that change of place accounts for the possession of white hair by the wild cattle of Chillingham Park, England, and black hair by the wild cattle of Scotland ; and the hump and humpless breeds of Asia and Africa. Naturalists however, seem to stumble over more difficult obstacles in their rambles through scientific research, than we who without science's aid have been using the various breeds of domesticated cattle all our lives in their endeavour to connect all bovine races with one common centre than those just mentioned. From the days of Laban and Jacob we have had handed down to us not only by tradition from sire to son, but by history, the cause of the varieties which took place in the colors of the flocks that were not only eating the same food, and under the same climatic conditions, but drinking the same water.

We have also a strange example in what is termed the "dollar spot" in the skin of the Ayrshire breed of cattle. It is undoubtedly peculiar to the Ayrshire, and gives considerable proof to the evidence already given of the strong admixture of aboriginal blood from the wild white and black cattle of the British Isles being in the veins of the Ayrshire more than any other breed.

We have also seen the descendants of the buffaloes that were imported to New South Wales during the early settlement—a few of those animals have been preserved in the colony. We have seen the lumps disappear after a few generations of crossing with the humpless breeds of Great Britain. But we have never seen nor read of a man (with the exception of Professor Low), who by the means of domestication alone, was able to breed humpless buffaloes ; a cross with a humpless breed must be resorted to before any improvement can be effected in that direction. These observations have no doubt raised doubts in the minds of unscientific breeders as to the correctness of any theory which may have for its object the tracing of all our breeds of dairy cattle from a common ancestry. But doubts seldom, if ever, disprove any theory.

We have ample proof of the affinity that exists between certain breeds of cattle which are dissimilar in every respect as regards general appearance—so far as the human eye and hand can detect. Take the Ayrshire cow, for example ; she is outwardly unlike all other breeds of cows in general outline, yet no other cow possesses the same range of affinity. You can cross an Ayrshire with either a Jersey, Short-horn, Guernsey, or Friesian bull, and get a superior dairy animal. Not so with a Jersey cow. She must be mated with bulls of her own breed, otherwise the progeny will not be so good.

Within our own memories we have seen a great variety of breeds of dairy cattle in New South Wales, and innumerable crosses from these breeds. One is safe in stating that during the decade 1840-1850 there were in the county of Camden, Argyle, Murray, Auckland, and St. Vincent the very best representatives of all the breeds of cattle then existing in Great Britain and Ireland. There were Durhams, Longhorns, Holderness, Pembroke, Friesian, Suffolk polled, Norfolk polled, Lincoln red, Normandy, Devon, Hereford, Alderney, Jersey,

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Guernsey, Ayrshire, Argyleshire, and Kerry. Each breed had its advocates in the colony as on their native heaths, and were kept pure or judiciously crossed for whatever purpose they were required. In other and probably more numerous instances these breeds were allowed to mix together indiscriminately. But if our memories serves us rightly they were all good milkers. In our boyhood days we have seen what would pass for representatives of all those breeds in one dairy herd of seventy or one hundred head. As years rolled on many of these breeds seemed to have dropped out of existence, and it now seems like so much waste time to follow them to their graves; nor could any tangible reason be assigned for the dispersal of many of these breeds of cattle, valuable as they have been in New South Wales, outside that already given—to wit, the beef craze.

The writer would not be in a position to-day to even state with any degree of certainty anything regarding these discarded (if we dare say it) breeds of cattle that obtained in the past, and from which undoubtedly sprung our best types of dairy cattle were it not for the records that have been kept of the transactions of our pioneer settlers, and the many statements that have been collected from the sons of those old pioneers who were the cowboys of the thirties and forties. The writer has spent twenty-five years collecting information from the old pioneers and their sons who carried on dairying and the milking of cows during the years 1835-65, and the general opinion of all those settlers throughout the counties just named is that, with few exceptions, all the breeds of cattle during those years were capable of giving up to the dairymen the very best milking cows, some herds, of course, being much more prized than others for giving good returns under all conditions.

No doubt many would account for the passing out, in the sixties, of such a number of valuable breeds of cattle without leaving many of their descendants behind, to the law of absorption or that of the survival of the fittest. Be that as it may, one is quite safe in stating that, at the beginning of the sixties, the Red Lincoln, the polled Suffolk, and Norfolk, the Longhorns, the Holderness, the Pembroke, the Guernsey, the Jersey, and Normanby, &c., had all ceased to be considered breeds of cattle in New South Wales; and the breeds that survived and became generally recognised throughout the colony were the Shorthorn, the Hereford, the Devon, the Ayrshire, Argyleshire, and polled Scotch breeds, the Friesian or magpie cattle and their numerous crosses. Some of the breeds that ceased to be recognised simply passed out for the want of admirers, such as the Longhorns, Holderness, Pembroke, Suffolk, and Norfolk polled; and their places were taken up by the Shorthorn and Red Lincoln; the Normandy and Ayrshire took the place of the Alderneys, Jerseys, and Guerneys, &c. The Herefords, Devons, and black Scotch cattle, taking the fancy of the beef-raisers, were soon discarded for the dairy. Later on the Shorthorn absorbed the Lincoln reds, and the Ayrshire absorbed the Normandy, leaving the dairymen to choose between the Shorthorn, Ayrshire, and Friesian.

Few, unfortunately, of our early dairymen studied purity of blood; the majority of dairymen did not bother about purity so long as a cow gave plenty of milk, and depended largely on those who had large herds of cattle to supply them from time to time with bulls. This system of keeping up the bull supply had many advantages, inasmuch as the larger breeders had better opportunities of selecting good sires and dams from which to breed bulls; and, further, the smaller dairymen, not being so much interested in bull as in cow breeding, used to borrow and lend bulls to each other freely. Therefore, when a good bull came into a locality he was not so liable to be destroyed as in later years, but would be passed on from farm to farm until six or more dairymen would have practically the same blood disseminated through their herds. The strain of this bull (if good) would be sought out, and more bulls would be obtained from the

THE ORIGIN OF CATTLE.

person who bred the original animal, and thus the fame of a certain strain would in time become famous.

On the other hand, if breeders sent bulls into the market who had failed to satisfy the small settlers with the quality of their stock, there would be no demand for them, and in consequence such breeders would have to turn their attention to improving their stud herds as quickly as possible. This competition for first place among the large breeders stimulated the ambitions of young men to go in for stock raising with a view of eclipsing the efforts of their fathers. This ambition, laudable as it may appear, did not succeed to that point which most breeders would have considered the crowning epoch.

As has been pointed out elsewhere, when touching on the administration of Sir George Gipps, the monetary depression which immediately followed the sudden boom which the Governor created by enforcing the theories of Mr. Gibbon Wakefield on the settlement of New South Wales in 1840-44, soon began to operate in the opposite direction. During the years just mentioned a great boom set in in connection with station property and stock of all kinds. It was customary to purchase stations with the stock thrown in. Scores of these stations were stocked with cattle that represented all sorts of breeds. These mixtures may be described as blacks, blues, browns, brindles, and being at this time objectionable colors among the younger class of breeders in the colony, they were sold off and sent off to be boiled down for their hides and tallow. It was in this dispersion that the breeds mentioned herein disappeared. Any bull showing his appearance on any station or farm with a skin covered with black, brown, blue, or brindled colored hair where there was either Shorthorns, Lincolns, Devons, or Hereford herds, was shot on sight. The breeders of the black Scotch breeds were equally jealous of their herds, and would not permit anything approaching a light-colored animal to live on their holdings.

The passion for discovery soon took possession of the native-born white population, and the new arrivals being anxious to see bush life, took advantage of the opportunities afforded by these experienced bushmen to see what was to be seen without risking too much. To us who live in times when Australia has ceased to be an unknown land their efforts in this direction may appear to have been small and the results insignificant, but it should not be forgotten that the horizon was at that time the boundary of most of our cattle stations in New South Wales. Most readers of Australian history will have ere this read of the adventures of the convict cattle king, George Clarke, better known in his own time as "George the Barber," who, having run away from the "settlement," he took to "cattle-duffing" and squatting as a tortoise goes to water. Others, again, may have read of the famous cattle queen "Molly Morgan," who carried out cattle raising, and took her turn at droving far beyond the bounds of settlement. Each in turn answered a purpose by stimulating the youth of the country to go afield to find new pastures.

In 1852 the Killerly herd of Shorthorns were sold by auction in England. It would appear that there was a general depression in agriculture in all parts of the United Kingdom and Ireland, and the cattle at this sale did not realise satisfactory prices. The Booths were the first breeders to exhibit stall-fed or housed cattle at English shows in or about the year 1843. At the above sale Mr. R. Booth bought the highest priced animal, namely, "Venus Victrix," at 175 guineas, and presented her to his brother. "Venus Victrix" is described as a cow of exceedingly good form. "Her back was broad and level, her ribs well arched; her breast heavy and wide, and her thighs full." Her weak point was that which is usually found in conjunction with good milking qualities—a little want of substance in the neck and chin.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

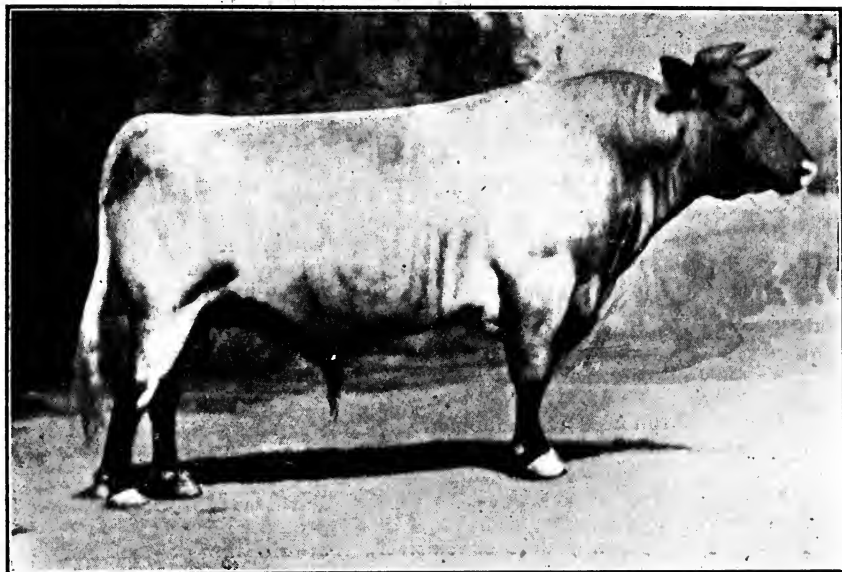


Bull Emblem of Darbalara. Color : Roan.
Bred by and the Property of the Scottish Australian Investment Co., Ltd.

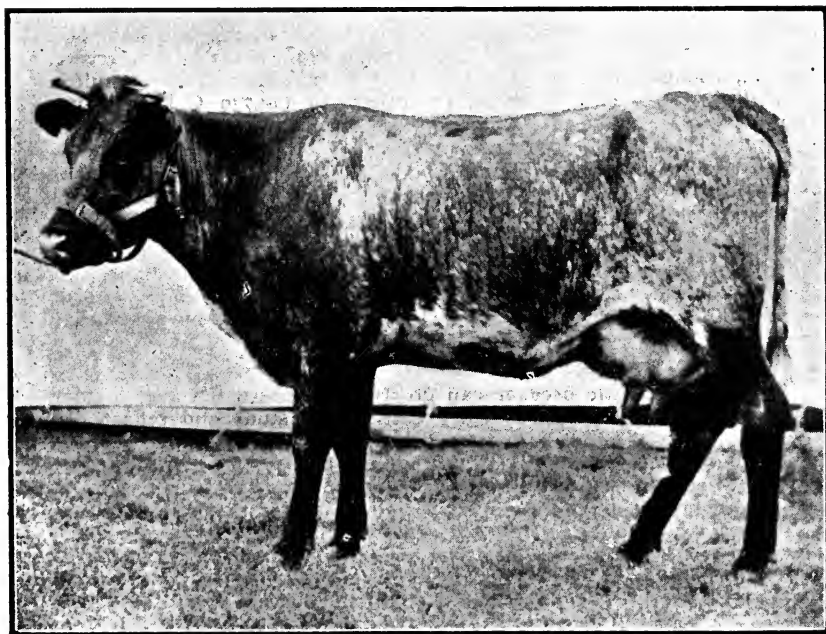


Cow, Melba. Color : Roan.
Bred by and the Property of the Scottish Australian Investment Co., Ltd.
(For further particulars see Appendix.)

THE ORIGIN OF CATTLE.



Bull, Banker II. Color : Light Roan.
Bred by and the Property of the Scottish Australian Investment Co., Ltd.



Cow, Oonah of Darbalara. Color : Roan.
Bred by and the Property of the Scottish Australian Investment Co., Ltd.
(For further particulars see Appendix.)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

From Venus Victrix was descended "Hecuba," by Hopewell from a dam by Hamlet out of a Leonard cow. She was in color a dense red; a large animal on short legs; when not in milk laying on flesh with wonderful rapidity; and when in milk she was what every dairy cow ought to be, a great deep milker, with capacious udder. From this cow the unrivalled bull, "Windsor," was descended, the progenitor of the bull "Royal Windsor," whose portrait is given on page 109.

If we retrace our steps to the year 1810, when the Collings Bros. parted with their celebrated bull Comet for a small sum of 1000 guineas, and study the history of development of the beef breeds of cattle of Great Britain and Ireland, we cannot be but impressed with the plain truth that excessive feeding and in-and-in breeding had at that early date been in operation—but possibly not to the enormous extent which obtained in the fifties. It was not till about the fifties that Bates' Longhorned Durhams—which were noted milkers—were almost completely absorbed by the Shorthorns. Of these truths we have ample proof by following closely the great change in type which immediately followed the importation of all classes of cattle arriving in New South Wales from the old country.

The very fact of such cows as Venus Victrix and Hecuba being condemned by competent beef judges in England for possessing points prized by dairymen proves conclusively that the aim of the beef-breeders of England in 1850 was to stamp out the dairy quality of their stud Shorthorns. And, of course, the same applies to those men who fancied other breeds of beef-producing animals.

Depending, as the New South Wales breeders were, on the English breeders for their stud animals during the period under review, it is patent that the dairy quality of our herds was soon influenced. There were, however, a few notable Shorthorn bulls imported to the colony about this period, among which we may mention the bull Lablache, by Prince Imperial (15,095 C.H.B.), imported by Mr. Clark Irvine, Tomki, Richmond River, in 1858; Inkerman, by Duke of Hamilton (19,618 C.H.B.), dam Playair, by Inkerman (14,730 C.H.B.), imported by Mr. John W. Chisholm, of Wollagorang, in 1863. But even these bulls were in every sense beef animals, and only gave good results from a dairyman's point of view when their progeny were mated with essentially dairy cattle.

The writer often heard old settlers who had, so to speak, grown up with this State, say as far back as forty years ago that in their boyhood days the "Madagascar" breed of cows and the old Longhorns were infinitely superior in every respect for dairying purposes than any breed of dairy cattle introduced here since 1850.

The most a cattle breeder can do with regard to the past history and origin of our breeds of dairy cattle is to study and reflect. In order to study the past he must endeavour to grasp those facts placed before him by early writers whose humble pens may perchance carry them through the scenes of the early developments of many a valuable herd of cattle, where neither his horse, or for the matter of that a railway train, could convey him. In following these writers he must reflect on the great length of time spent by the ancients in order to perfect their flocks and herds. For be it remembered among those who decry the breeds of cattle that obtained prior to the days of Bates, Collings, or Booth, we rarely, if ever, find the noble, the high-minded, or the well-educated. Nearly all the critics are from the more modern types of cattlemen. It must be remembered, therefore, that the refutation of theories and remedy of errors of cattle breeding

THE ORIGIN OF CATTLE.

cannot precede their rise ; and thus the fact of mistakes in the past, or false steps in the aims of every improvement thereof, involves the corresponding introduction of true ones.

The ancients had vast opportunities of improving their herds according to their lights. They carried on the business of cattle raising century after century, the father handing down his experience to his children without a break, generation after generation living, as it were, in the same field with the stock they were raising. The cattle raised for sacrifice on their altars had to be of the most perfect types, with unbroken colors. Hence we, with our boasted advancement, can by study and reflection learn much from the ancients in that respect.

103

CHAPTER II.

THE DIFFERENT BREEDS.

Speaking of the different breeds of cattle in Great Britain and Ireland, Wilson says :—"The diversities observable in the size, shape, habits, and produce of their cattle have arisen partly from modern artificial breeding, but chiefly from the prolonged and combined influence of climate, soil, pasturage, and general treatment. So long as cattle were allowed their natural liberty, unrestrained and unmodified by enclosures, cultivation, and artificial treatment, all were clean made, glossy, swift footed, shy, spirited, and active ; but when they become completely subject to the control of man, and dependent on him for food and protection, they lost their sagacity and energy ; such as were amply supplied with nutritive food became plethoric, bulky, and sluggish ; and such as were ill-fed continued small in size, and acquired bad shapes and lean, feeble, unproductive habits. Comparatively few of them migrate from district to district, or undergo changes of climate, pasturage, and artificial treatment ; but most are reared and fed for generations in the same district, and many on the same estate or farm ; and they consequently retain for ages an uniformity, or at the utmost a very limited diversity, of size, shape, and constitutional qualities. Hence particular breeds were formed and fixed long before the modern period of artificial improvement ; large, strong breeds pervade some districts, and small, weak breeds pervade others ; powerful, bulky, well-formed, and productive breeds are co-extensive with the range of climate, soil, herbage, culture, and treatment best fitted to improve them ; such large cattle as those of the eastern counties of Scotland are merely varieties of the same breed as the small ones of the Grampian Mountains and the Hebridean Islands ; and the smallest feeblest, worst shaped, and least productive are capable of being in the course of two or three generations, transmuted, by means of superior climate, feeding, crossing, and management, into as valuable cattle as any of the best existing varieties."

Mr. Wilson probably bases his assumption on the old theory, "What's best in a breed goes in at the mouth." But it would require a long number of years to convert a Jersey into a Shorthorn by either change of soil, climate, or food, or all three combined, without resorting, as he says, to crossing ; then it is doubtful if either of those breeds would benefit by such a cross to such an extent as would pay for the experiment.

To revert to Mr. Wilson again :—"The breeds and varieties of cattle at present reared on British farms are exceedingly numerous, and approximate one another by a series of the nicest and almost imperceptible gradations. Yet, though capable of multitudinous classification, and though often requiring, for purposes of convenience, to be arranged into numerous distinct divisions, they can be comprehensively distributed into five great groups—the polled or hornless, in Galloway, Suffolk, and Norfolk ; the crumpled-horned in Alderney, and some parts of Ireland and Scotland ; the Shorthorn in Durham, Eastern Yorkshire, Lincolnshire, and the northern English counties ; the middle-horned in Herefordshire, Gloucestershire, North Devon, East Sussex, Wales, and most of Scotland ; and the Longhorned in Ireland, Lancashire, and the Midland counties of England. But only in their native districts, or, on a few select estates, are these to be found pure. Everywhere else they are so thoroughly mixed as to form a bewildering number of mongrel varieties."

Youatt claims the Longhorns as an Irish breed ; in this he is certainly right, but when he says that the middle-horned breeds are the aboriginal breed of England he soon becomes lost in history.

THE DIFFERENT BREEDS.

Passing the history of our breeds of British cattle by for the present, the slightest observation will convince the average breeder that there are several breeds of cattle that are essentially the same. Every writer of note who has had ample opportunities of comparing the Devon and Ayrshire with the wild white cattle of Chillingham Park have been struck with the great resemblance in many points, notwithstanding the difference in color, while all three bear no resemblance to the breeds found in other parts of England and Scotland. If any dependence can be placed in the picture presented to our view of Austrian cattle there is certainly a striking resemblance between some of those foreign breeds and those found to-day in the British Isles. Take, for example, the "Murzthal cow"; she is exactly like the Jersey in general appearance and color; then there is the "Podolian cow"—the appearance and shape of horn, color, and constitution is the same as the Devon. Then, again, there is the "Kuhland cow," with the white face and back, the head and horn, resembling in a marked degree of Hereford.

What is still more remarkable, the milk and butter producing qualities of each of these Austrian breeds correspond, with the exception of quantities, with their prototypes in Britain. Yet, by all accounts, there has been no alteration in the breeding of Austrian cattle for centuries. We are, therefore, inclined to believe that the points which distinguish, or the properties which constitute, the best varieties of cattle are, to some extent, matters of dispute, and cannot be claimed absolutely by any particular locality, yet form an important subject of study to every judicious farmer, and ought, with as much exactitude as possible, to be determined and understood.

Some secondary points affect appearances and beauty, and are matters of mere taste; other secondary points affect adaptation to peculiar climate or methods of feeding, or to the purposes of respectfully the beef cask or the dairy, and in some instances can be determined only by patient investigation and trial; and all the primary points affect constitution, economy, and productiveness, and occur in all possible varieties of good cattle, and may be regarded as the mere indications of established natural laws, so they ought to be distinctly known, not only in full-grown and animals in good condition, but in young, lean beasts, by everyone who buys, keeps, or sells dairy cattle.

Were a general observer to look upon a dairy cow, either within a few weeks of calving or a few weeks after calving, he might admire her fine outline, the glossy hair, and the tint of the color, well defined, as in the Ayrshire, or mingled as in the Shorthorn, the gentle expression of her countenance, or above all her beautifully formed and distended udder, from the nature of which he might instantly exclaim, "What a lovely animal!" On the other hand, were he to look upon exactly the same type of cow, and in every respect equal in quality, but half-run in her milk, no signs of calving being at hand, lean, and otherwise out of condition, he might think her outline angular and coarse, and pronounce her body to be a rugged skeleton covered with a tough skin, and altogether an inferior cow.

Not so, however, with the good judge. He can pronounce a cow to be of certain quality, whether she be fat or thin, in full milk or partly dry, and can anticipate in accordance by well-defined rules, formed by practical experience, the degrees of excellence a cow will attain if properly treated. A good judge has only to look at an animal to grasp all the properties of symmetrical form, fine bone, sweet disposition. Such knowledge is begot only of experience. In other words, begotten of practice and study.

Many of our more successful dairymen claim that the quickest and surest road to success, or even a small degree of success, in breeding dairy cattle is that of selecting and mating members of the same family, viz., a male and female of the same strain, and whose appearance, functions, use, disposition, and quality are as near as possible

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

the same. If the result is a female, when of proper age is mated with her own sire, and if the result is again a female, it is mated in due course to the same sire that was her sire as well as her grandsire. The same course is resorted to in mating the son with his own dam, and so on. This is what is termed in-and-in breeding; and while the consituation remains sound and robust it is unquestionably very effective. Nevertheless, it is a dangerous system to follow.

On this question Darwin says:—"However little we may be able to explain the cause, the facts under review show that the male and female elements must be differential to a certain degree in order to unite properly, and to give birth to vigorous progeny such differentiation of the sexual elements follows from the parents and their ancestors having lived during some generations under different conditions of life." The theory holds good with plants as animals.

If the theory advanced above be correct, then no bad effects will necessarily result from breeding in-and-in, until uniformity of type which implies unity of organism is attained, provided we use on the coast from time to time animals of the same strain reared on the tableland. Where bulls from the same sire by different dams are used for several generations the bad effects, if any, seem to develop but slowly. It is now generally understood that both Bakewell, Bates, and Booth adopted the in-and-in breeding principle of breeding, and their stock, although bred for beef purposes, never wholly lost their milking qualities until it was bred out of them in or about the fifties. Take, for example, Red Daisy. She came from a strain of milkers in direct descent from Bates. Her dam, it is said, gave sixteen quarts of milk at a meal, and her daughter was not far behind her. This class of cow was of no value to the beef-raisers of America or Australia. So in the course of years the British Shorthorn was made for beef only, and their milking qualities discarded.

One school of writers will say, "Begin the habit of long milking with a heifer, and persist in it, and she will keep it up afterwards." Another will say, "Whatever will increase a cow's comforts will increase her productive power." But these ideas remind one of the first instructions in cooking the hare—"first catch your hare." The dairyman must first get his cow before commencing experiments. Hence it happened that when the dairy farmers discovered that it was by no means an easy matter to undo the damage wrought by the English and colonial beef-raisers to the dairy quality of the Shorthorns, they took the very quickest method at their disposal to get back some of the dairy quality—namely, the introduction of Ayrshire and Jersey bulls, with a fair amount of success.

The majority of the dairymen had long previously learned how to tend and care cows, and how to milk and train heifers in the way they should grow. In these crosses there were many disappointments. Now and then, however, two strains of chiefly Shorthorns and Ayrshires would be found to possess the desired affinity for each other, and the produce of these would turn out good.

At the same time, speaking generally, it is not an easy—in fact, it is a very difficult—matter to get any two strains of an opposite breed to blend just as we desire it. It is a difficult matter to mate two animals of the same breed. We must therefore avoid extremes as much as possible. These extremes are often hidden from our view by that great envelope—the skin of the animal—through which experience only teaches us to read the secret contents by intuition and the guidance of the eye and the hand.

Experience, however certain it may be, is a very slow instructor. Hence it is that many of our dairymen have been trying for years to breed a type of dairy cow like the old types of Durham, Lincoln, and Longhorn mixtures of the forties and fifties by crossing beef Shorthorns with Ayrshire in every shape and form, and failed. They

THE DIFFERENT BREEDS.

have been simply trying to construct a fabric in the absence of the most essential materials.

The old-time dairy Durham has been completely changed. The same may be said of the once celebrated Red Lincolns, and as for the Longhorns, there has not been one of the type seen on the South Coast for many years. The reason is plain, i.e., whilst dairy farmers were and are making money out of crossbred cattle as they have been and are doing to-day—when the opportunity offers—they will never pause to think of the future. Suffice for the day has undoubtedly wrought evil among our dairy herds.

The intimate nature of things is generally unknown to us ; we know nothing about it, and that little very imperfectly. The would-be cattle breeders must never forget this highly important truth. It will show them the necessity of assiduous labor if they wish to discover and examine the nature of anything. Further, this truth is not at all flattering to the pride of some of our cattle breeders, but it is clear in the eyes of whoever has meditated on the science and art of cattle breeding, and is therefore worthy of our best attention.

The preceding reflections show the necessity of having fixed ideas and formed opinions about matters relating to cattle raising. It has been said that great thoughts spring from experience ; and it might be added that great errors also come from it. We have examples of this latter truth every year on our show grounds, where we have cattle breeders catering for the weakness of judges instead of adhering to their own opinions.

What we want is a Cattle Breeders' Association composed of men who will not look for individual honors, but who will work collectively and with one united object—namely, the perfecting of a breed of dairy cattle the basis of which should be honestly laid.

In other countries, such as the Islands of Jersey, it took several Acts of Parliament to establish a breed of cattle. It will require the same thing in the coastal districts of New South Wales, and a Cromwell to administer the law before we may look with confidence to the future as regards absolute purity of blood.

Every science needs a starting point, and the professor of it anxiously seeks this point. The architect looks for a foundation; so does the cattle breeder. Unfortunately what is wanted is not always found. But no effort should be lost to gain it.

CHAPTER III.

THE SHORTHORN.

When treating on the Shorthorn breed of cattle one is constrained to recognise Professor Allan, the great American authority, as having grasped more fully the prevailing impressions of the history of this important breed of cattle than other writers, and to agree with him when he states that the majority of these impressions are false ones.

It does not require much argument to prove that the historian of to-day has a far better grasp of the history of Great Britain and Ireland than the majority of those who attempted to write history, say, a century, or even less than half a century ago. The reason is plain. Writers are becoming better informed, owing to the fact that now they look at both sides of a question with less prejudiced minds than heretofore. To-day we look for facts, not fame.

When Mr. George Coates, an eminent breeder, who first collected the pedigrees of Shorthorn cattle, which were commonly known under the local name of "Teeswaters," the breed had got a firm hold on public estimation in the County of Durham. At that time, their origin was somewhat uncertain, some maintaining that they sprang from Dutch extraction, and were imported into Hull, while others contended they could be traced to the Western Highlands, having a mixture of Kyoel blood in them. To-day, neither of these opinions would be considered worthy of much importance, in the light of experience.

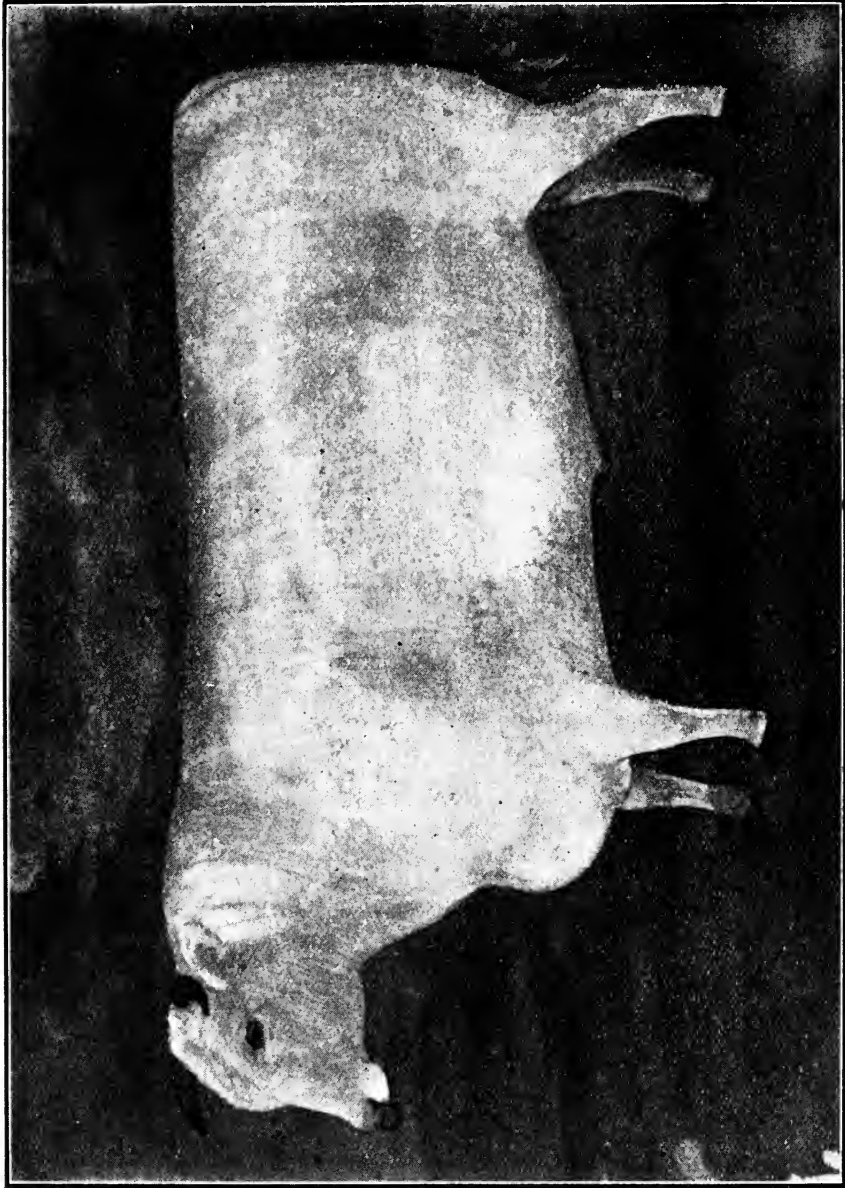
Mr. Henry Dixon, in a prize essay upon the "Rise and Progress of Shorthorns," which appeared in the *Journal of the Royal Agricultural Society*, says:—"The germ of this wonderful array of animals, which are recorded in the 'Herd Book,' must have been considered an 'improved' county breed, so far back as 1787." It is said that "Hutchinson, of Sockburn, had then a cow good enough to be modelled for the Cathedral Vane, and had also beaten Robert Colling in a bull class at any show in England."

According to Coates' "Handbook," Hubback (319) is described yellow and white, calved in 1777, bred by Mr. John Hunter, of Hurworth; got by Mr. George Snowdon's bull (612), his dam (bred by Mr. Hunter) by a bull of Mr. Bant's of Hurworth, g.d., bought of Mr. Stevenson, of Ketton.

Take, for instance, Youatt, who is frequently mentioned as the most important authority on our breeds of British cattle, owing to the fact that he published his book in 1835 under the auspices of a society then existing in London for the diffusion of useful knowledge. While giving well established authorities for his statements on most of the breeds which he noticed, left the Shorthorn to the tender mercy of the Rev. Henry Berry, a man of only limited experience, not having been interested in the so-called improved Shorthorns for more than ten years as a breeder, and what experience he had was with only one or two strains of the breed. Now, this sort of experience, as we know, would naturally tend to prevent the writer from going too far back with his history in case it might bring his herd in touch with other herds, and thus spoil his little ambition, which he endeavoured to keep in the forefront, i.e., that he possessed the only pure breed of Shorthorns in England. We have many such authorities to-day.

It was the Rev. Mr. Berry who worked up the story, which conveys the impression that the foundation of the improved Shorthorn was brought about by Colonel O'Callaghan having brought two Galloway

THE SHORTHORN.



ROYAL WINDSOR.
A Shorthorn Bull bred by and the property of the late Mr. E. B. Woodhouse, of Mount Gilead, Campbelltown,
New South Wales.
From a pencil drawing presented by Mrs. E. H. Woodhouse, of Campbelltown, to the author many years ago.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

heifers, to Mr. Collings' bull Bolingbroke, and that owing to pre-arrangement between them Mr. Colling got a bull calf, the result of the union, and when he grew up he put some of his best cows to him.

As this union or cross is treated on elsewhere we can pass it over for the present as being one of the many cattle-breeder stories about my herd and my neighbour's herd, which should always be taken on their face value throughout the dairy world.

Bailey, in his "Survey of Durham," published in 1808, says:—"Seventy years since, or about 1738, the color of the cattle of Messrs. Millbank and Croft, were red and white, white, strawberry, and red about the head and neck. As it was, the Millbank and Smithson's herds that were used in after years by Mr. Bates in founding his celebrated herd at Kirklivington.

Mr. Bakewell is allowed by every writer on cattle to have been the first person who systematically improved the breed of live stock, with a view to the production of beef, but no mention is ever made of the famous Longhorns as milk cattle in Ireland and several counties in England centuries before Bakewell was born.

After Mr. Bakewell comes the name of Mr. Wastell, who was the first man to improve the beef-producing qualities of the Shorthorns. Mr. George Culley is often mentioned as the first improver, but he was born in 1730, whereas Mr. Wastell was born in 1712, and is described as a man possessed of superior information in his day, and was long recollected and spoken of as having the clearest conception and correct judgment of any breeder of his day.

The bull "Hubbuck" is invariably mentioned as the animal which laid the foundation of the improved beef Shorthorns. This bull is described as having a very pleasing countenance, his coat was soft, and his eye mild and clear. His color was yellow, red, and white. His granddam was by Mr. Snowdon's bull, and was bred on the dam's side by Sir James Pennyman's bull. His sire was by Mr. Robson's bull, and Mr. Robson's bull was bred by Mr. Wastell from a cow by Mr. James Masterman. Masterman's bull was by the old Studley bull. This is about as much as is known of Hubbuck's breeding.

Mr. Bates was a man of some literary ability, but turned his attention to breeding stock about the year 1796. He was a great admirer of Hubbuck's stock, and continued breeding Longhorned Durhams till 1849, at which date he died. His cattle were usually good milkers.

Australia received many consignments of Bates' stock. Some of our most noted breeders would have only Bates' bulls in their herds. Of course, those who imported these valuable animals did so with a view of producing beef—not dairy produce.

But notwithstanding this, we have the testimony of several of our leading cattle breeders that occasionally a bull came out from the great herds of England that would sire milk heifers no matter how he was mated. Others, again, say that some of the imported bulls would do so when mated with one particular strain, but when otherwise mated the production would not feed their own calves. The latter theory is the one most generally accepted to-day by breeders.

The "Druid," writing in "Saddle and Sirloin" says:—"Modern history has been much too sparing in its prose picture of pastoral life. A great General or statesman has never lacked the love of a biographer; but the thoughts and labor of men who lived 'remote from cities' and silently built up an improved race of sheep or cattle, whose influence was to be felt in every market, have had no adequate record. One slight sketch in the 'Gentleman's Magazine' is nearly all that remains to us. We can go back, through its guidance, to the days when Bakewell was a living name, and Dishley, the headquarters to

THE SHORTHORN.

which all the best breeders of farm stock made resort. The scene rises up through the dim vista of more than one hundred years."

In the business room there are not only skeletons, but pickled carcasses of sheep, whose points were most after their breeder's heart; but he shows with no less relish some beef joints, the relics of his "Old Comely," who died at 26 years and the outside fat of a sirloin fully four inches thick. The latter were his Longhorn trophies, and no man could boast of a herd with deeper flesh and lighter offal. In his eyes the breed was fated to represent the roast beef of Old England for ever and aye; and the thought that the very glory of their herds would be objected to as taking up too much room in the straw-yards, and that a race with shorter horns and earlier maturity from "the banks of the stately Tees" would ruthlessly push them from their place and reduce them to a mere fraction in the Midlands never vexed his soul. Their hold of public favour had been long and sure, and their greatest triumph was to come. If "Two Pounder" had then the reputation of earning 800 guineas in one season and serving some picked home ewes as well, the Dishley bull "Twopenny" was fated to make the herd of Fowler of Rollright, and swell its sale average to £81 14s. 3d. for fifty-one head, a good average in those days.

Longhorns of some kind or other, and generally with good milk marks and the faculty of fattening at a great age, were at this period the farmers' friends. They excited the admiration of Dr. Johnson in Derbyshire, and led him to note that his host "whose talk is of bullocks" sold one of them for 100 guineas to Sir A. Ramsay to cross with the Aberdeenshire and other breeds of that period.

The Holderness, a fine, large-framed breed, with good backs, long quarters, remarkably clean, straight legs, and well-developed udders, grazed in the district north of the Humber. Many of them were white, with blue or bay flecks but the largest number were dark mouse and white, and, as was natural from their proximity to Hull and their general appearance, they were thought to be of Dutch origin. Milk was their speciality, and Mr. Curwen was wont to value their dairy produce at £20 a year per cow.

Under the local name of "Teeswaters" the Shorthorns, to which the Holderness seemed to bear the most affinity in character, had got a strong hold in Durham several years before the close of 1799; but still it was not until "The Durham Ox" commenced his six years of caravan life in 1801 that the doom of the Longhorns were virtually sealed as regards beef producers, though not as milkers.

The Teeswaters were cattle of great substance, but somewhat ungainly in form, and were thought to give no less but richer milk than the Holderness. The fragments of history on which their origin rests are somewhat shadowy and uncertain. Some contend therefrom that they must be of Dutch origin, and only another version of the Holderness! and others, with equal zeal, that their tap-root is to be found in the West Highlands, or that their earlier breeders always fell back on its bulls for a cross if they thought that their herd was losing constitution. There is certainly some confirmation of this opinion in the peculiarly sharp horns and ink-black noses which will appear at intervals. These characteristics, however, may be inherited from their aboriginal ancestors. The admirers of the "Princesses" make good the claims of long descent as far back as 1739, on Stephenson's farm at Ketton; and it is also said that the ancestors of the "Duchesses" roamed in Stanwick Park over 200 years ago, and that none of the tribe had been out of the Northumberland family until Charles Colling bought them. Be this as it may, the Teeswaters' capability of development, which the St. Quinton, the Pennyman, and the Milbank families were among the first to recognise, had suggested itself to many a

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

long-headed Durham farmer as well as the brothers Colling; but private herdbooks were hardly in vogue, and the patient pilgrimage of Coates, through sunshine and shower, has not had the effect of tracing the breed further back than four crosses beyond Hubback (319) who was calved in 1777.

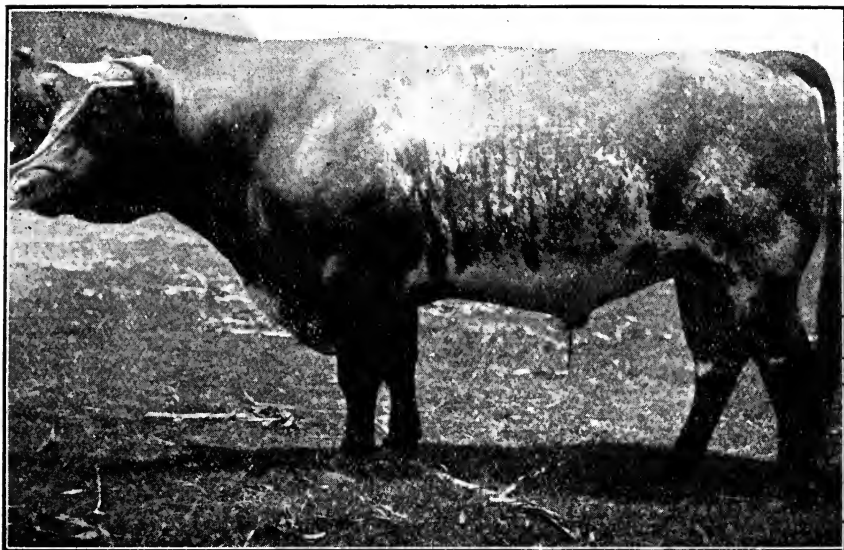
If the red and white Studley bull (626), bred by Sharter, of Chilton, and the founder of the "Gwynne" or "Princess" tribe, may claim to be the "Abraham of Shorthorns," James Brown's red bull (97) and Jolly's bull (337) are very early names on the roll. Seventeen or eighteen crosses separate the Duchesses from the one, and the Maynard and Mason tribes are the direct descent from the other. Only 710 bulls were registered in the first volume of Coates' herdbook, which was published in 1822 but the fifteenth showed, under Mr. Stafford's care, an accession of 1959 in two years, and the seventeenth brought up the number to zemi (25,481).

Other Durham breeders stood proudly on their family tribes. The "Lizzies" were with Charge, of Newtown, and Rose's and Fisher's stock can be traced to Cornforth, of Barforth. Robert Colling had set his seal to Hill of Blackwell's herd, and nearly all the best men were dipping into the blood of Millbank, of Barningham. It was from his sort that there sprang the old yellow cow by "Punch" which was the granddam of the "white heifer that travelled." The Maynards were also in the front rank. Maynards' Favourite tribe was very early in repute, and Charles Colling (who had previously picked up his "Cherry" or "Peeress" tribe in Yarm market) never rested till he had bought the cow and her calf, "Young Strawberry," by Charge's "Dalton Duke" (188). He then changed the cow's name to "Lady Maynard," and it was upon her tribe that he is said to have used the "Alloy blood, through "Grandson of Bolingbroke" (280), which made the highest average in its hour of trial at Ketton. Her descendants were also crossed most successfully with "Foljambe" (263), the sire of "Phoenix," the dam of the bull "Favourite" (252), who was in turn the sire of the 1000-guinea "Comet" (155). "Hubback" (319) has always been considered the great regenerator of Shorthorns; but he did not do Charles Colling so much good as "Foljambe," who was from a "Hubback" cow, and he was parted with at the end of two seasons, which is alluded to by several writers.

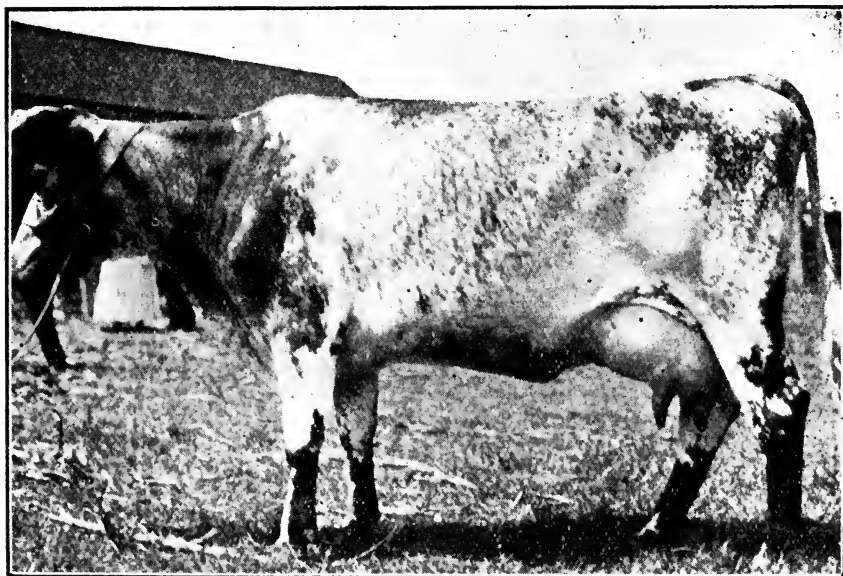
The aim of the brothers Colling was to reduce the size and improve the general symmetry and flesh points of their beasts. "Beauty," sister to "Punch" (531), had spread their fame beyond the country, and in 1799 the Durham ox, by "Favourite" (252), came out first at Darlington with his half-sister of the "Duchess" tribe. The latter was quite as great a wonder in her way, and confirmed Mr. Bates' fancy for the sort which was hereafter to be linked with his name. Even at the Ketton sale in 1800 the taste for Shorthorns was confined within a narrow compass, as Durham, Yorkshire, Lincolnshire, Northumberland, and Westmoreland were the only counties which purchased. Some of the few survivors of the assembly still speak of "Comet" as the most symmetrical bull they have ever seen. He was not very large, but with that infallible sign of constitution, a good wide scrop or frontlet, a fine placid eye, a well-filled twist, and an undeniable back. His price caused breeders everywhere to prick up their ears. They had already heard of Fowler refusing 1000 guineas for a long-horned bull and three cows, as well as for a cow and her produce for eight seasons, but never of one bull achieving that sum. The produce of the Comets were most prolific in New South Wales.

For many years previous to this sale Mr. Bates had been breeding Shorthorns by the Tyne side, and bringing his beasts, as Sir Hugh

THE SHORTHORN.



Bull, Aristocrat of Oakdale. Color : Roan.
Bred by and the Property of Mr. George Tate, Oakdale,
Kangaroo Valley, N.S.W.



Cow, Tory of Oakdale. Color : Light Roan.
Bred by and the Property of Mr. George Tate, Oakdale,
Kangaroo Valley, N.S.W.

(For further particulars see Appendix.)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Smythson had done before him, to periodical scale tests. Still, he does not seem to have struck out any special herd line for himself till he took a fancy for the Duchess tribe. Charles Colling assured him that the cow which he bought in 1784 out of Stanwick Park was the best he ever had or ever saw, and sold him her great granddaughter "Duchess," by "Daisy Bull" (186). She was the prelude to Mr. Bates' purchase of "Duchess 1st," by "Comet" (155), the only Duchess at the Ketton sale, and a very cheap lot at 186 guineas, as, independently of her produce, her new owner left it on record that she gave 14lb. of butter (21oz. to the lb.) per week for six weeks after calving. "Belvedere" (1706), of the Princess tribe, was the bull which Mr. Bates selected to bring out the Duchesses. He was small and plain, and with rather rough shoulders, but as soft as a mole in his touch. The brothers Colling had a most faithful disciple in the Kirklevington philosopher, as his celebrated show bull "Duke of Northumberland" (1940) was by "Belvedere," dam by "Belvedere," and was thus bred on precisely the same principle as four of their leading animals—"Comet," "The Ox," "Punch," and "Broken Horn"—rather an instructive comment on the popular timidity which eschews even an approach to in-breeding. His sale in 1829 was to breeders quite a harvest, owing to the quality of the herd.

Whitaker, of Burley, held his first sale soon after. He had always gone for milking tribes in his quiet Yorkshire valley, and laid much stress upon the purchase of "Magdalena," by "Comet" (155), the only cow which was kept out of the Ketton sale catalogue. She gave 32 quarts of milk a day, equal to 80lb.

The Booth family began at Studley about 1790, with Teeswaters, and "Twin Brother to Ben" (660); and lengthening the hindquarters, filling up the foreflank, and breeding with a view to that fine deep flesh and constitution which bear any amount of forcing, have been their special aim. It was the late Richard Booth's opinion that no bull had done his herd so much good as "Albion" (14) of the Alloy blood, and Mr. Whitaker and Mr. Wetherell were quite with him on this point. It may be said that Shorthorns generally have grown smaller in frame, and that there is perhaps not that rich coat and uniformity of character which marked some of the earlier herds; but still those who can make the comparison from memory are fain to allow that in their flesh points and general weight the breed knows no decay, according to the best authorities of that time.

Richard Booth, of Crofton, might be said to have initiated the modern plan of keeping beasts far more in the house, preparing them specially with a view to shows. No blood has been more widely spread than that of "Warlaby" and "Killerby" throughout the United Kingdom, or commanded a finer bull-lending trade; and it was from "Buttercup," a daughter of "Brampton Rose," and crossed with Booth's "Cweller" (10,354), that "Butterfly" sprang, the chief foundress, with "Fredrick" (11,489) of the Townley herd, whose victories in the store and fat shows combined are wholly without parallel.

Mr. Bates had two very favourite maxims—one that he "could find forty men fit to be a Premier for one fit to judge Shorthorns"; and the other that there was "no place for Shorthorns like the Valley of the Wharfe." The Messrs. Whitaker and Fawkes, of Farnley, have proved this to the full; but it was left to Major Gunter to found a second Kirklevington on its banks, and to vow that eternal allegiance to the Duchesses and Oxfords which their great founder had done. Major Gunter previous to his purchase of the Duchess and Oxford tribes had only a few Alderneys and ordinary Shorthorns on his estate, according to the English writers.

The keen competition of the American buyers for the animals of these tribes at the Fortworth sale on August 24th, 1853, stimulated his am-

THE SHORTHORN.

bition. He accordingly bid 200 guineas for Duchess 64th, but was hardly taken, and his 400 guineas was soon left in the rear by the Transatlantic rivals. Duchess 59th, however, fell to his nod at 350 guineas, then Duchess 66th followed suit at 310 guineas. It was with these two and Duchess 69th, by 4th Duke of York, whom he afterwards bought privately at nine months for 500 guineas from Mrs. Tanqueray, that Major Gunter commenced his herd, which soon took the place of the late Mr. Bates' Kirklevington Shorthorns. His next purchases were 6th Duke of Oxford at Hendon for 200 guineas, and his dam Oxford 11th for 700 guineas when she was just four years old.

It is unfortunate that the opinions of such a notable breeder of Shorthorns as Mr. Bates should only come to us, as it were, second hand. It was not through any lack of literary ability that caused Mr. Bates to leave this world without placing on record his impressions of breeding Shorthorns, as he was an educated man. It could not be his seclusiveness, as it would appear from the following discussion which he had with Mr. Charles Colling :—

Mr. Bates, speaking of Mr. Colling, said :—" Never had I to differ from him in opinion but this once, though we often compared notes, and always till this instance did we agree. The animals we differed in opinion about both belonged to Mr. Robert Colling ; the one was 'Styford,' which I had bred the previous year ; the other was what is called the "Grey-bull," which Mr. Hustler, and his tenant from Acklam, had hired the year before. After a long discussion on the handling I asked Mr. Colling to go and re-examine both animals, and then say whether he continued in the same opinion or not. He did so, and then acknowledged his error, and said 'the Grey-bull has precisely the same handling as 'Hubback' had, and better than any other except the cow you bought of me yesterday evening and all her predecessors have had the same handling.' Mr. Colling always showed the 'Duchess' family as the model of good handling."

"I asked," said Mr. Bates, "the breeding of both animals, and was told by Mr. Robert Colling that they were from two own sisters. I then asked what bull they were each by, and the answer was 'Styford is by Favourite and the Grey bull is by the White bull, and the White bull's dam was by Favourite.' I offered him on ascertaining this cow's breeding, 100 guineas if he would let me put her to the White bull, but he refused. I repeated this offer several times. It was not, however, till 1831 that I succeeded in obtaining the desired cross, when I obtained the same blood in 'Belvedere.' Thus with a union of the Duchess and Princess blood I produced some of the finest strains of Shorthorns. The daughter of 2nd Hubback was put to 'Belvedere,' and in no other strain can the Shorthorn blood be found pure."

This is about the most important statement we can gather from Mr. Bates' many but strangely guarded remarks. Now, "Hubback," strange to say, after being in the possession of Mr. Charles Colling for three years, was actually sold for 30 guineas, and he was under offer a long time before anyone would venture that sum of money for him. Even Mr. Booth refused to buy him, and he was considered an excellent judge.

As has been stated elsewhere, "Hubback" had a large body set on short legs, and was what is commonly termed a big, or pot-bellied bull. At the Durham Show in 1785 Mr. Charles Colling obtained the premium with the product of the bull "Hubback." In 1792 he (Mr. Colling) obtained the premium with "Lord Bolingbroke," and it is said that "Lord Bolingbroke" took after "Hubback." In 1796 Mr. Colling again took the premium at the Durham Show with "Favourite."

Mr. Bates' first Duchess cow produced "Ketton," and it was to "Ketton" that his cattle owed their superiority. "Yarborough's" stock turned out well also. The dam of "Yarborough" and "Duchess 1st" were the only cows that went direct from "Hubback" to the bull "Favourite."

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

From the foregoing statements it will be seen that when "Coates' Herdbook" was established the founder had every reason to base the origin of the beef Shorthorn on the bull "Hubback." "Hubback" was evidently a good doer, and responded quickly to generous feeding. He had also the power, begotten, probably, of prepotency, which conveyed his fattening qualities on his progeny. This fattening quality was then worked into a distinct type by means of systematic in-and-in breeding, as shown in the Duchess and Princess tribes. As years passed by the beef type became more and more deeply established at the expense of the dairy quality, until dairymen had to depend on obtaining what is known as a "cry-back," the result of that well-known law of Nature termed atavism, which is often recognised in all breeds and classes of stock raised under the most careful forms of domestication. It is that law which upsets the theory of "like begetting like."

Owing to the silence of Mr. Bates on matters of breeding, it is very difficult indeed to define the exact date when he went outside his own herd to select stud animals. He commenced with the Longhorned Durham, and perfected his herd to such a degree of excellence that his oft-repeated phrase, "good wine needs no bush," became a household phrase among breeders. Yet we find in after years that he never rested till he obtained the Shorthorn bull "Belvedere" to mate with a few of his choicest cows. His success as a breeder could not be attributed to chance.

CHAPTER IV.

THE AYRSHIRE.

Speaking of the Ayrshire, "Sturtevant" says :—"The Ayrshire head is not like the head of any other dairy animal. Indeed, in all the descriptions given of the heads of other breeds, the most perfect animals have been figured, and not the animal typical of the breed. If many of the Ayrshires hint of the Highland, of which they may inherit something, it is a hint only. Though doubtless something of their unrest and assurance is only half concealed in her face, there is a cowy, or milky, look that comes of the use for which she is reserved; there is a look of domestication that has not been carried to the highest pitch. It has not, as in the Prince Albert Suffolk swine, quite subjected her to its behests. Of course, the degree to which this is carried varies in different families.

"The countenance should be serene, mild, and expressive the latter to be born of motherly instincts. The perfect animal is being brought to this; but the majority of the Ayrshires have an earnest liveliness of expression which is all their own, and which the portrait artist must recognise. In form the head may be long and of no great comparative breadth, or it may be short, with considerable breadth."

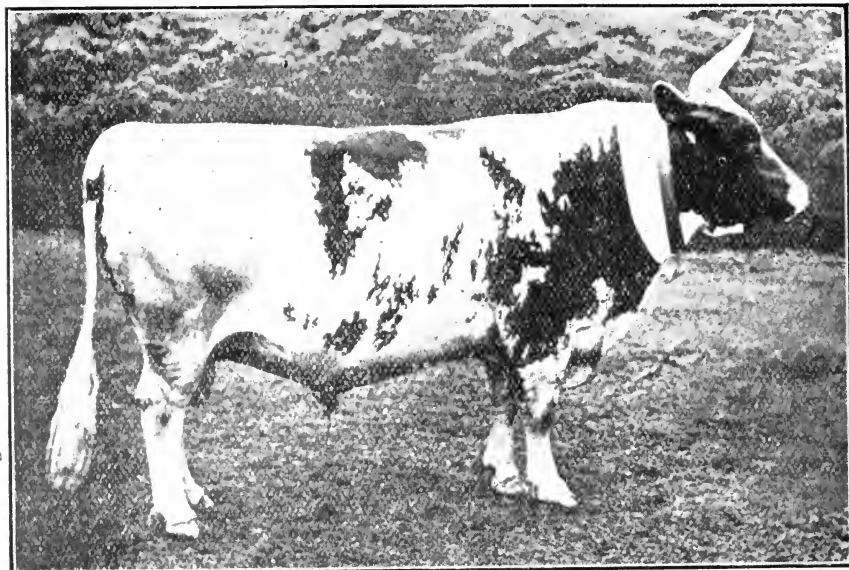
William Aiton, in the survey of Ayrshire, printed at Glasgow in 1811, says the shapes most approved of are :—"Head small, but rather long, and inclined to narrow at the muzzle. The eyes small, but smart and lively. The horns small, clear, crooked, and their roots at considerable distance from each other."

These aspects, with the exception that the eye is larger and fuller, the muzzle larger, and nostrils wider, the horns not so wide apart at the base, are found in the Ayrshire to-day. Her carriage is what may be inferred from a study of the head of the animal. Her walk is easy, at times hurried into a trot, which spoils her gracefulness.

In describing the Ayrshire, a prominent breeder says that "the most important point of an Ayrshire cow—in fact, any dairy cow—is a good constitution; and a good constitution is indicated by large lungs, which are formed in a deep, broad, prominent chest, broad and well-spread ribs, a respiration somewhat slow and regular, a good appetite, and, if in milk, a strong inclination to drink, which a large secretion of milk almost invariably stimulates. In such cows the digestive organs are active and energetic, and they make an abundance of good blood, which in turn stimulates the activity of the nervous system and furnishes the milk glands with the means of abundant secretion. Such cows when dry really take on fat. When activity of the milk glands is found united with close ribs, small feeble lungs, and a slow appetite, often attended by great thirst, the cow will generally possess only a weak and feeble constitution; and if the milk is plentiful it will generally be of bad quality, while the animal, if she does not die of diseased lungs, will not take on fat readily when dry and fed."

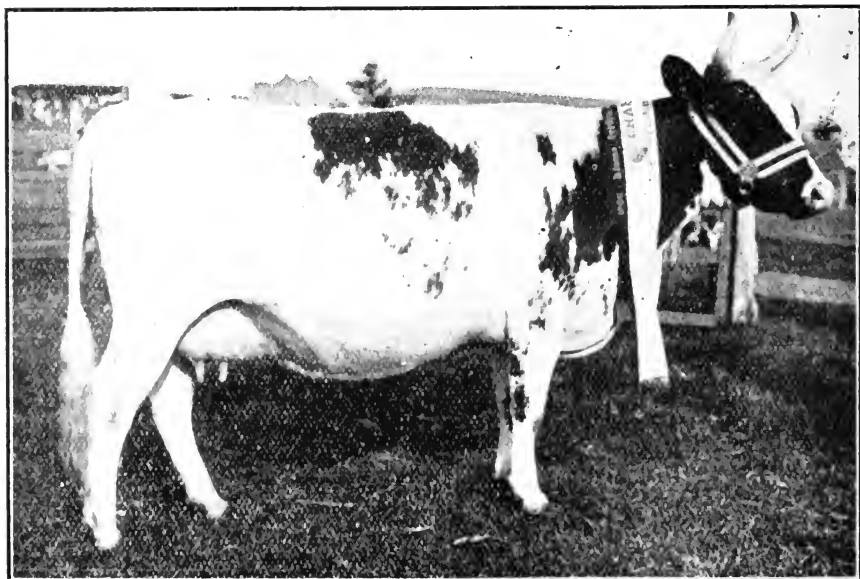
In order to have no superfluous flesh, the cow should have a small, clean, and rather long head, tapering towards the muzzle. A cow with a large, coarse head will seldom fatten readily or give a large quantity of milk. A coarse head increases the proportion of weight of the least valuable parts, while it is a sure indication that the whole bony structure is too heavy. The mouth should be large and broad; the eyes bright and sparkling, but of a peculiar placidness of expression, with no indication of wildness, but rather a mild and feminine look. These points will indicate gentleness of disposition.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.



Bull, Jemie of Oakbank (184) (A.H.B.A.). Color: Brown and White.
THE CHAMPION AYRSHIRE BULL OF AUSTRALIA.

Bred by Messrs. McNab Bros., Oakbank, Victoria. The Property of
the late Sir John Hay, Coolangatta, New South Wales.

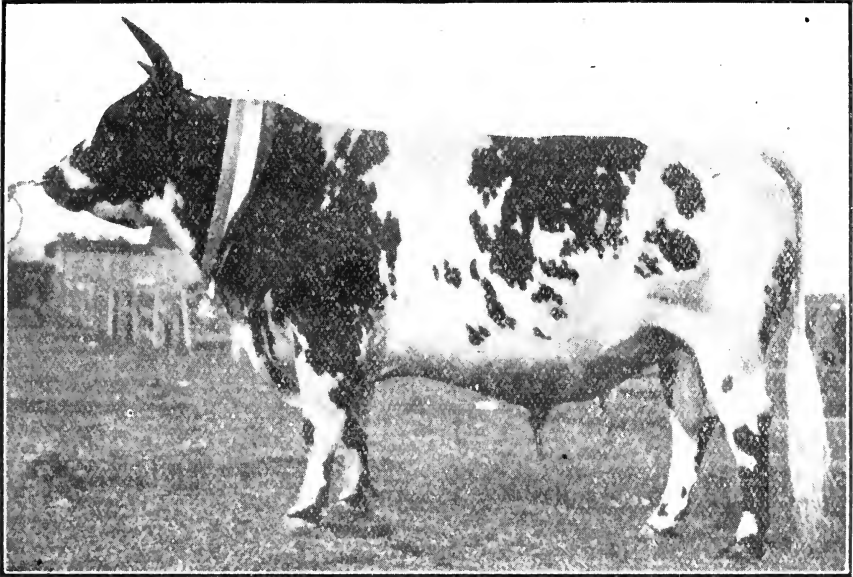


Cow, Jenny of Oakbank (1046) (A.H.B.A.). Color: Brown and White.
A CHAMPION AYRSHIRE COW.

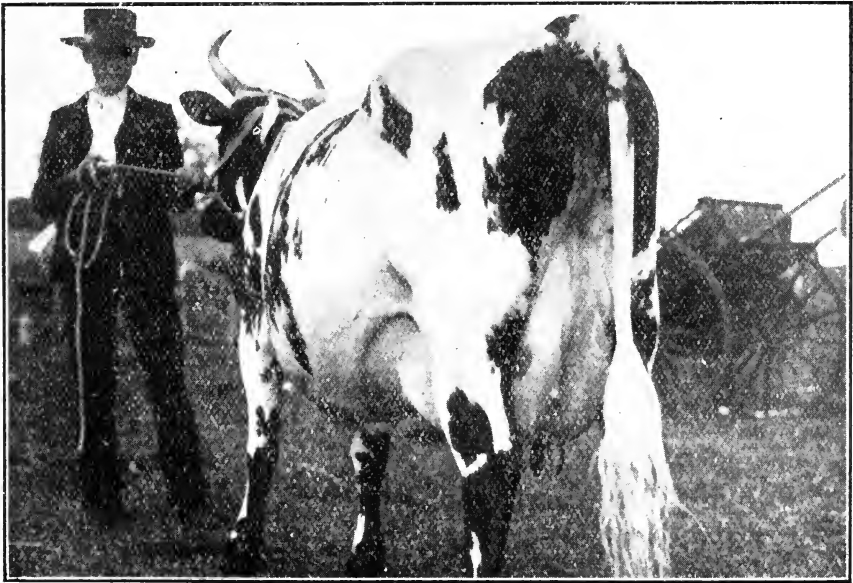
The Property of the late Sir John Hay, Coolangatta, New South Wales.

(For further particulars see Appendix.)

THE AYRSHIRE.



Bull, Allanta's Prince of Meroo. Color : Brown and White.
Bred by and the Property of Mr. Charles Lamond, Meroo,
Shoalhaven New South Wales.



Cow, Aid of Oakbank. Color : Brown and White.
Bred by Messrs. McNab Bros., of Oakbank, Victoria. The Property
of Mr. Charles Lamond, Meroo, Shoalhaven, N.S.W.

(For further particulars see Appendix.)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Such cows seem to like to be milked, are fond of being caressed, and often return caresses. The horns should be small, short, tapering, yellowish, and glistening. The neck should be small, thin, and tapering towards the head, but thickening when it approaches the shoulder; the dewlap small. The forequarters should be rather small when compared with the hindquarters. The form of the barrel will be large, and each rib should project further than the preceding one up to the loins. She should be well formed across the hips, and long in the rump. The spine or back should be straight and long, rather loosely hung, or open along the middle part, the result of the distance between the dorsal vertebrae, which sometimes causes a slight depression, or sway back.

By some good judges this mark is regarded as of great importance, especially when the bones of the hindquarters are also rather loosely put together, leaving the rump of great width and length, and the pelvis large, and the organs and milk vessels lodged in the cavities largely developed. The skin over the rump should be loose and flexible. This point is of great importance; and as, when the cow is in low condition or very poor, it will appear somewhat harder and closer than it otherwise would, some practice and close observation are required to judge well by this mark. The skin, indeed, all over the body, should be soft and mellow to the touch, with soft glossy hair. The tail if thick at the setting on, should taper and be fine below.

But the udder is of special importance. It should be large in proportion to the size of the animal, and the skin thin, with soft loose folds extending well back, capable of great distension when filled, but shrinking to a small compass when entirely empty. It must be free from lumps in every part, and provided with four teats set well apart, and of medium size.

Nor are the milk-veins less important to be carefully observed. The principal ones under the belly should be large and prominent, and extend forward past the navel, losing themselves, apparently, in the very best milkers in a large cavity in the flesh, into which the end of the finger can be inserted; but when the cow is not in full milk the milk-veins, at other times very prominent, are not so distinctly traced and hence, to judge of its size when the cow is dry, or nearly so, this vein may be pressed near the end, or at its entrance into the body, when it will immediately fill up to its full size.

The milk vein does not carry the milk to the udder, as some suppose, but is the channel by which the blood returns; and its contents consists of the refuse of the secretion, or what has not been taken up in forming milk. There are, also, veins in the udder, and the perineum, or space above the udder, and between that and the buttocks which it is of special importance to observe. These veins should be largely developed, and irregular or knotted, especially those of the udder.

The knotted veins of the perineum, extending from above downwards in a winding line, are not readily seen in young heifers, and are very difficult to find in poor cows, or cows of only medium quality. They are easily found in good milkers, and if not at first apparent they are made so by pressing upon them at the base of the perineum, when they swell up and send the blood back to the vulva. Their full development almost always indicates an abundant secretion of milk; but they are far better developed after the cow has had two or three calves—which demonstrates the importance of careful handling.

The climate of Ayrshire, we are told, is moist and mild, and the soil generally of limestone formation, varying from a rich to a clayey nature, and well adapted to pasturage, but difficult in parts to till. The cattle are naturally hardy and active, and capable of enduring severe winters, and easily regaining condition with the return of spring and good feed. There is, withal, a great humidity about the shores

THE AYRSHIRE.

of Ayrshire, owing to the action of the Gulf Stream, which enables the farmers to produce early crops of vegetables.

The pasture land of the country is devoted to dairy stock, chiefly for making butter and cheese, a small part only being used for fattening cows when too old to keep for the dairy.

The breed has undergone very marked improvements since Aiton wrote in 1811. The local demand for fresh dairy products has very naturally taxed the skill and judgment of the farmers and dairymen to the utmost through a long course of years; and thus the remarkable milking qualities of the Ayrshires have been developed to such a degree that they may be said to produce a larger quantity of rich milk and butter in proportion to the food consumed, or the cost of production, than any other of the purebred races.

The owners of dairies in the County of Ayr and the neighbourhood were generally small tenants, who took charge of their stock themselves, saving and breeding from the offspring of good milkers only.

It is thought by some—and probably it is true of the Ayrshire—that in the breeding of animals it is the male which gives the external form, or the buoyant muscular system of the young, while the female imparts the respiratory organs, the circulation of the blood, the mucous membranes, and the organs of secretion. If this principle be true, it follows that the milking qualities come chiefly from the mother, and that the bull cannot materially alter the conditions which determine the transmission of these respective qualities, especially when they are so strongly marked as they are in the Ayrshire or Jersey races. It might also go to show why an Ayrshire bull, when mated with medium bred Shorthorn cows, generally give such splendid results as regards fineness of structure.

Of course, there are many excellent dairymen who maintain that it is more important to the perfection of their dairy to use good bulls from an undoubted milking strain, claiming that perfection is more surely transmitted by the male than the female. Others still maintain that both parents are represented in the offspring, and that it is impossible to say beforehand what parts of the derivative system are to be ascribed to the one parent, and what to the other, and that there is a blending and interfusion of the qualities of both.

Mr. Aiton, in describing the mode of rearing calves in the dairy districts of Scotland—and we may add it is also the practice generally followed throughout the dairying districts of New South Wales among the better class of dairymen—says:—"They are fed on milk with seldom any admixture; and they are not permitted to suckle their dame, but are taught to drink milk by the hand from a dish. They are generally fed on milk only, for the first four, five, or six weeks, and are then allowed from two to two and one-half quarts of new milk each meal, twice in the twenty-four hours. Some never give them any other food when young, except milk, lessening the quantity when the calf begins to eat grass or other food, which it generally does when about five weeks old, withdrawing it entirely about the seventh or eighth week of the calf's age. Some feed their calves partly with meal mixed in the milk, after the third or fourth week; others introduce gradually some new whey among the milk, first mixed with meal, and, when the calf gets older, they withdraw that milk, and feed it with whey and porridge. Hay-tea, juices of peas and beans, or peas or bean straw, linseed beaten into powder, are all used; sometimes with advantage."

The calf of to-day may be said to be pretty well the same sort of delicate, complex creature it was in Mr. Aiton's day, and farmers have to study its nature just as studiously as of yore; hence many dairymen are now much wedded to the artificial system of suckling calves.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

They argue that this system of suckling induces a greater secretion of saliva, which, by promoting digestion, accelerates the growth and fattening of the young animal. Indeed, calves are much disposed to lick and suckle anything that comes within their reach, which seems to be the way that nature teaches them to secrete saliva.

Reverting again to the Ayrshire, we think that it is very generally conceded that for purely dairy purposes the Ayrshire cow deserves the first place. In consequence of her small, symmetrical, and compact body, combined with a well-formed chest and a capacious stomach, there is little waste, comparatively speaking, through the respiratory system, while at the same time there is very complete assimilation of the food, and thus she converts a large proportion of her food into milk. So remarkable is this fact that all dairy farmers who have any experience on the point agree in stating that the Ayrshire cow generally gives a larger return of milk for the food consumed than a cow of any other breed. The absolute quantity may not be so great, but it is obtained at a less cost than most breeds of dairy cattle.

If we consider the Ayrshire cow as a breeder, we find that when mated with either Jersey, Guernsey, or Shorthorn bulls she will throw a calf of superior quality. She has therefore in this respect a great advantage over other dairy breeds. Some of the best dairy cattle in Australia to-day, as in the past, were grade Ayrshires, larger in size than the pure bloods, but at the same time giving certain signs of their origin in an unmistakable degree.

Landseer has been recognised the world over as the most exact of all our artists when animals were the subject of his artistic genius. One of his masterpieces is the picture of the "Wild White Cattle of Chillingham Park." Taking the wild bull and cow as they appear in that picture, and you have a perfect description of the forequarters of an Ayrshire bull and cow, according to the opinions of the best judges to-day, notwithstanding their many changes.

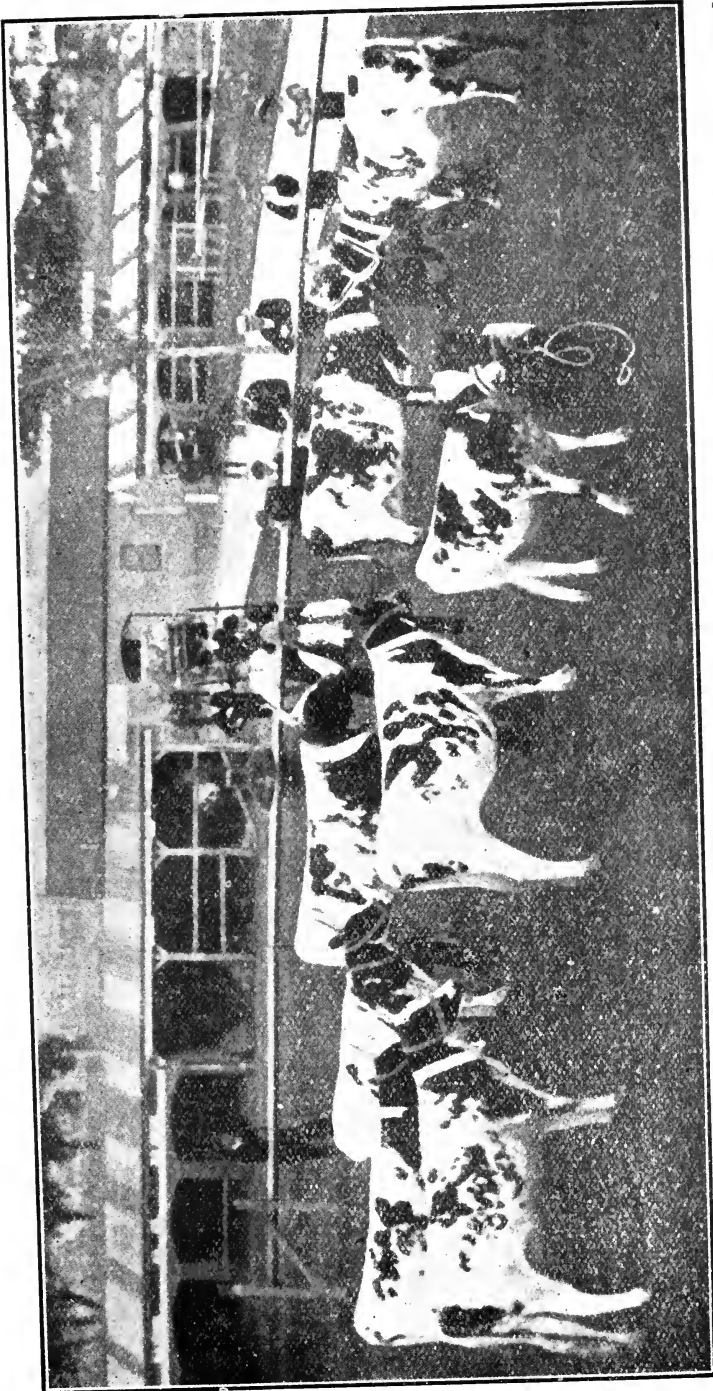
The Ayrshire farmers prefer their dairy bulls to possess the feminine aspect in their heads, necks, and forequarters, with broad hook bones and hips, and full in the flanks; they likewise pay particular attention to the formation of the small teats of the bull, and also to the color of the scrotum. If this were any other than white, though the animal might otherwise be possessed of great merit, he would immediately be rejected by the best breeder. They also pay great attention to the formation of the testicles as regards size and formation throughout, although not an infallible sign.

Unquestionably the Ayrshire bull is a very excellent animal. He is less dainty as a feeder than any other breed of dairy animal. In fact, the Ayrshire generally is a very contented and easily managed animal when properly understood and intelligently managed.

In color the bulls, like the cows, varies between red and white, brown and white, liver and white, yellow and white, and even black and white. There should be no intermingling of color; each color should stand out boldly and distinctly. The flecked spots should be defined by two borderings, so to speak, and the "dollar spots" should appear as indents in the skin. These "flecked" and "dollar spots," as already mentioned, are undoubtedly the indications of the blood of their ancient ancestry, to wit, the wild white cattle of Chillingham Park and the black semi-aboriginal cattle of the Highlands.

"The udder of the Ayrshire cow," says Dr. Sturtevant, "although differing in outward shape in individuals, it yet retains a certain uniformity which may be considered typical. This is in the gland of the teat. The glands are rather flattened than pointed, or elongated, as in other brands. They are well held up to the body, and in the types of the breed extend far forward and back, with a broad and

THE AYRSHIRE.



Champion Group of Ayrshire Cattle at Royal Show, Sydney, 1904. The Property of the late Sir John Hay Coolangata, N.S.W.
(For further particulars see Appendix.)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

level sole. The teats are small, and of a cylindrical shape, rather than cone-shaped, as seen in other cases. The udder is admirably fitted, by its elasticity, for the storage of milk, and when the glands are at rest, occupies but little space. The eye, accustomed to see the pendent, fleshy udder, so often met with in dairy animals, is apt to under-rate, in comparison, the capacity of the small bag of this breed, with its wrinkled and folded covering, so deceptive to the unskilled, but so full of promise to the educated observer. At the proper time, these wrinkles smooth out, the folds expand, and the filled udder of the Ayrshire has come to be regarded as a model shape for all dairy breeds. The teats are, however, often too small for comfortable milking; but careful breeders have remedied this defect, to a great extent, and whole herds can be found with superb udders and teats of good size, although rarely large."

The Ayrshire is of a highly nervous temperament. The cow has a superabundance of nerves, and is willing to employ them upon instant demand, in self-defence or self-support. The bulls, if properly handled, are not fractious, but the old ones are rather inclined to be quarrelsome in the vicinity of other bulls, with a decided love of home. They are always active and energetic; stop only for a purpose; move off with a brisk walk, and often trot without special provocation.

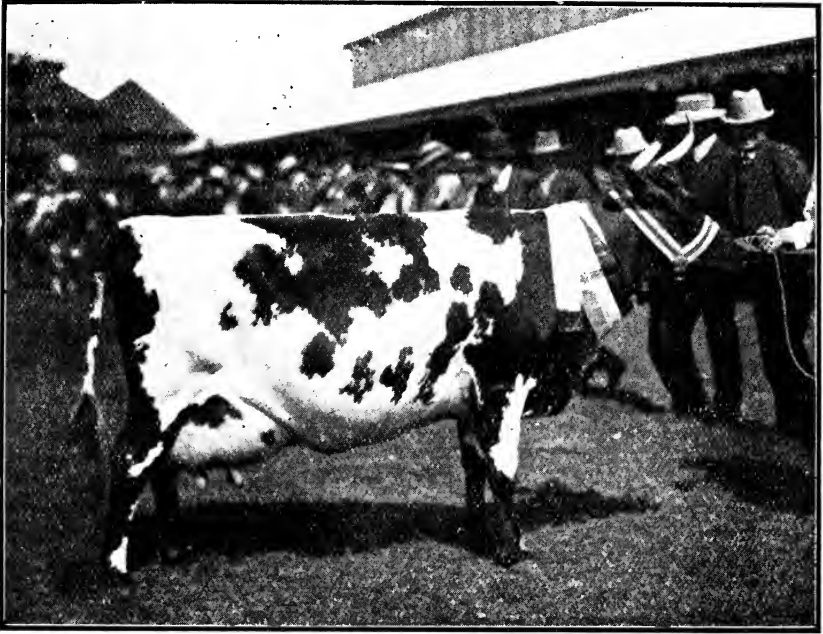
Promptness is one of the characteristics of the breed, caused probably by the nature of the climate and surroundings in the South-west of Scotland, extending for 80 miles in the vicinity of the River Clyde and the Irish Sea.

The Ayrshire Association of Scotland has endeavoured to immortalise the points of the Ayrshire cow in verse, which was a difficult task, even for the genius of the poets of Scotland, since the days of the immortal Burns. The more modern effort, however, is worthy of a place in any description which may be suggested of a model Ayrshire. It is as follows:—

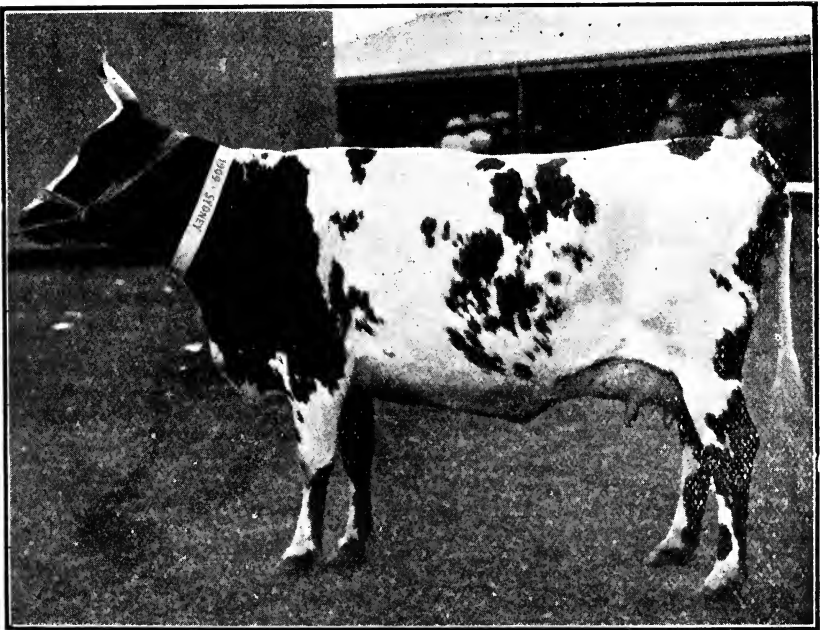
The Ayrshire Cow.

Would you know how to judge of a good Ayrshire cow?
Attend to the lesson you'll hear from me now.
Her head should be short and her muzzle good size,
Her nose should fine between muzzle and eyes;
Her eyes full and lively, forehead ample and wide,
Horns wide, looking up, and curved inward besides;
Her neck should be a fine tapering wedge,
And free from loose skin on the undermost edge;
Should be fine where t'is joined with the seat of the brain,
Long and straight upper line without hollow or mane;
Shoulder-blades should be thin where they meet at the top;
Let her brisket be light, not resemble a crop;
Her forepart recede like the lash of a whip,
And strongly resemble the bow of a ship;
Her back short and straight, with the spine well defined,
Especially where back, neck, and shoulders are joined;
Her ribs short and arched, like the ribs of a barge;
Body deep at the flanks, and milk veins full and large;
Pelvis long, broad and straight, and in some measure flat;
Hock bones wide apart and not bearing much fat;
Her thighs deep and broad, neither rounded nor flat;
Her tail long and fine and joined square with her back,
Milk vessels capacious, and forward extending,
The hinder part broad and to body fast pending;
The sole of her udder should just form a plane,
And all her four teats equal thickness attain,
Their distance apart when viewed from behind,

THE AYRSHIRE.



Ayrshire Cow, Whinflower of Oakbank. Color : Brown and White.
Bred by and the Property of the late Sir John Hay, of Coolangatta,
Shoalhaven, New South Wales.



Ayrshire Cow, Sophia 4th of Coolangatta.
Bred by and the Property of the late Sir John Hay, of Coolangatta
Shoalhaven, New South Wales.
(For further particulars see Appendix.)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Will include about half the udder, you'll find,
And when viewed from the side they will have at each end,
As much of the udder as 'tween them is penned.
Her legs should be shorn, and the bones fine and clean,
The points of the latter being quite firm and keen ;
Skin soft and elastic as the cushion or air,
And covered all over with short, woolly hair.
The colours preferred are confined to a few,
Either white and red, red and white, brown and white, or all brown,
will do.
The weight of the animal leaving the stall,
Should be about five or six hundred, sinking offal.

In conclusion, no one having been for a number of years interested in the Ayrshire breed of cattle could be easily led away with the theory set forth by writers, such as Aiton, or others of his period, that the Ayrshire were then but a modern breed, peculiar only to the Dunlop portion of the county. There are two theories, however, which are always worthy of a place in the history of the Ayrshire. It is thought by some that the origin of the Ayrshire cow was to be found in cattle which swam ashore to the islands of Bute and Arran, and the Ayrshire Coast, from the shipwrecked fleet of 160 crafts of the Norwegian and Dutch kings, whose soldiers, landing at Largs, in 1263, were at the latter place dispersed by the youthful King of Scotland, Alexander III. They had no evidence, at the time, that native cattle were on board these ships, although they learned afterwards from the history of the attempted invasion that West Highlander might have been aboard the fleet, as levies were exacted as tribute from the Chiefs of the Western Highlands of Scotland, during the progress of the fleet round the western shores of that country.

The second theory comes from Spanish history, where it is learned that a number of the 130 ships of the fleet of Phillip II. of Spain, who, in 1588, attempted to invade Britain, had dairy cattle on board, and it seemed generally credited that two ships of that fleet, which were wrecked on the Kirkoswald Coast of Ayrshire, carried milk cattle, which swam ashore. We have authentic records of the Andalusian breed of cattle being established in Spain at least a century before the Spanish Armada visited the coasts of Britain. They were of a characteristic type, that is, a beautiful, middle-sized, yellow-colored animal, with soft skin and long, stylish, widely upturned horns.

Writers knew that no native cattle were, of this description, to be found on the Ayrshire coast, where the cattle were mostly white, and black and white, spotted. Therefore, the mixing and crossing of the Spanish dairy cattle, with the native white ones, would produce a yellow and white flecked animal, and with the black ones a brindled animal. This theory would, on the one hand, account for the yellow and white-flecked appearance of individual specimens of some of our best strains of the present day—more particularly of the Macleay strain of fifty or sixty years ago, and for the brindled and black and white specimens which permeates many of our best herds.

There are not a few writers who claim that the Shorthorn must be credited with having been the improvers of the modern Ayrshire, and in proof of this assertion, state that the early development of the race was due to Mr. Bruce Campbell, factor for the Earl of Marchmont, on his Ayrshire property, who, about the year 1750, bought several Teeswater bulls, and brought them into the County of Ayr. Now, the animals so introduced, were said to have been of a very light brown or yellowish colour, spotted with white, and originally purchased from the Bishop of Durham, and located by the Earl of Marchmont on his Berwickshire Estate. This is stated to be unquestionably true, for it had been traced that Teeswaters of this color were so introduced, and used among herds by some of the dairy farmers in Ayrshire. If so, as is shown, it was only in isolated cases.

THE AYRSHIRE.

Granted that this is true, light-brown, or yellow spotted with white, was certainly not the colours of the improved Shorthorns of that period. But, on the other hand, that colour, as has been shown, was to be found in the Ayrshire breed for above a century previous to these reported Teeswater importations of the Earl of Marchmont time.

The Ayrshire cattle of Aiton's, or even Youatt's day, could not have had the same appearance as, say, some few years later, as their only food in winter and spring was oat straw, and what they could pick up in the fields, to which they were turned out every day, with a mash of a little corn with chaff daily for a few weeks after calving; even in summer, the pasture was in those days of poor quality.

The matter of pasture and feeding must always be taken into account when attempting to trace the origin of a breed of cattle, for, provided the animals have antiquity of birth to point to, it is surprising what remarkable alterations and improvements can be worked in any breed of cattle with good pasture and feed, in the space of a few years, especially so in our climate.

The Ayrshire in New South Wales to-day has the "dollar spot" and the nick in the ear—peculiar, 'tis said, to the West Highland breed of cattle—as strongly defined as in the beginning of last century, which is a strong indication of their antiquity.

CHAPTER V.

THE CHANNEL ISLANDS BREEDS.

The Jersey, The Alderney, and The Guernsey

The Jersey cow and her origin have occupied the mind of many historians, yet it cannot be stated with any degree of certainty, when the beautiful deer-like animals we see in our grassy parks, were originally evolved. If they are the direct descendants of an aboriginal breed, it is certain they must have passed through many refining stages long before reaching the Islands of Jersey.

Professor Boyd Dawkin, as the result of his investigations as to the origin of the small breeds of British cattle, believes that the "Bos Longifrons" or Celtic Shorthorn—an animal that never was aboriginally wild in Europe—is the progenitor of all the smaller breeds of cattle, including the Jersey, Brittany, Kerry, and Ayrshire breeds. He contends that the "Bos Longifrons" was domesticated in the East, and in a domesticated state was introduced into Western Europe. The only species of domesticated ox he met with in the refuse heaps of the British Isles, ranging from the neolithic age down to the time of the British invasion, and is represented now by the small Highland cattle, the small Welsh, and the small Irish cattle.

The description given of the "Bos Longifrons" of India is interesting, and may prove of value to those interested in the origin of any of the smaller British breeds, particularly the Jersey. "The color is chocolate-brown, deepening in shade underneath the lower part of the legs being a dirty yellowish-white. The shoulder is raised, not, however, into a hump, like that of the common buffalo, but into a kind of ridge, giving the idea of the spine beginning at the shoulder, had been raised and carried some little distance further back, and then allowed to drop suddenly into the ordinary level of the back. "Their milk, although not abundant, is extremely rich in butter-fat, which is highly coloured."

The following extract is from the Journal of the Royal Agricultural Society of England:—"There can be little doubt that, by the rich soil and genial climate of Jersey, a native breed of cattle, originally of a smaller character to those of Brittany and Kerry, has been fostered into a special excellency, which the pastures of the North-West of France and Ireland could not impart. A feeling of the inhabitants against the French cattle seems to have prevailed for years. One of the earliest historians (Rev. Phillip Falle), as far back as 1734, wrote that 'the cattle of this island are superior to the French,' and Thomas Quayle, in 1812, considered that 'the treasure highest in the Jerseyman's estimation is his cow.' The same spirit that now exists among the farmer of the island, to preserve the purity of their breed, doubtless actuated their forefathers over a century ago. Acts of the States of Jersey were passed in 1763, 1789, 1826, and 1864, prohibiting, under heavy penalties (£200, and confiscation of the cattle and boat) the introduction of cow, heifer, or bull from France." Strange to say, these Acts did not prohibit the importation of English cattle, as both Durhams and Ayrshires were introduced, but for what purpose is not clearly defined.

Of the Channel Islands breed of cattle very little is written prior to the beginning of the nineteenth century, and most of the contributions

THE CHANNEL ISLANDS BREEDS.

have been to the journal of the Royal Agricultural Society of England. In Appleton's journal, 1770, however the following description is to be found of the Channel Islands :—

“ In a deep bay of the north-west coast of France, lies a cluster of rocky islets, but little visited by the outlying world. They are interesting from their peculiar position, geographically, historically, and artistically. Only four of these are inhabited : Sark, by one family and their dependents ; Alderney, by the Government officers of the harbor of refuge, and a few fishermen ; Guernsey, by a thriving seafaring population ; and Jersey, by one of the most complete colonies of small gentility possible to conceive. The soil is very rich, and this is borne out by the remarkable fact that there are two inhabitants to every acre.”

This should be an important object lesson to those who are interested in the rich dairying lands of the South Coast of New South Wales.

In Jersey, horned cattle constitute the mainstay of agriculture ; it is that upon which the farmer chiefly depends for money to pay his rents, &c. The animal known in England and elsewhere under the name of Alderney is not in the true sense of the term an Alderney ; the reason for the breed going under that name is that from that island the first were exported to England. At present but few are exported but from Alderney and St. Heliers.

Mr. Willis P. Hazard, who is recognised by some breeders as a most reliable authority, says :—“ In form the Jersey cow is deer-like and small in size, the color mostly prized are light fawn and dark fawn, the brown, and orange fawn. Brindled specimens are to be seen, but they are not at all valued, and may be purchased extremely cheap.”

The outline history of the breed is this :—In the year 1789 the Jersey cattle were already considered so good, so superior to any then known, that an Act of the local Legislature was passed by which the importation into Jersey of cow, bull, heifer, or calf was prohibited, under a very heavy penalty. Later laws, being equally stringent, the Jersey must be extensively interbred.

Mr. David Hyam, of Nowra, Shoalhaven, a recognised authority on the Jersey cow, says there are three distinct colors, viz., silver-fawn, dark-fawn, and lemon-fawn. The first-named is the most fashionable for show purposes, and generally carry off the prizes when competing, although he had often found that the dark and lemon-fawns are equal for dairying purposes. Cows, however, of the breed, of whatever colour, should be without any mixture of white, as, in his opinion, they showed a cross—perhaps generations back. During his experience of over twenty years, he had not, in one instance, known where a pure-bred bull and cow had been mated, that their progeny had shown white. He says he had often heard of broken colored cows and bulls being pure, but, from his experience, he had great doubts ; in fact, was almost certain that mixed or broken-coloured Jerseys were not pure-bred.

He further remarked that in judging Jersey cattle the principal points that should be looked to are : A good escutcheon, without this a cow cannot have a good udder, nor produce good milk. The back should be straight, and the hips wide apart, the pelvis arch high, and well-formed ; rump evenly formed and of good length, tail well set, fine and long ; barrel hooped, deep and well-ribbed up ; back, broad, dished ; throat clean ; eyes full, with a kind expression ; horns, small across the loins ; wither, fine with flat shoulders ; head, small and dished ; throat clean ; eyes full, with a kind expression ; horns small

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

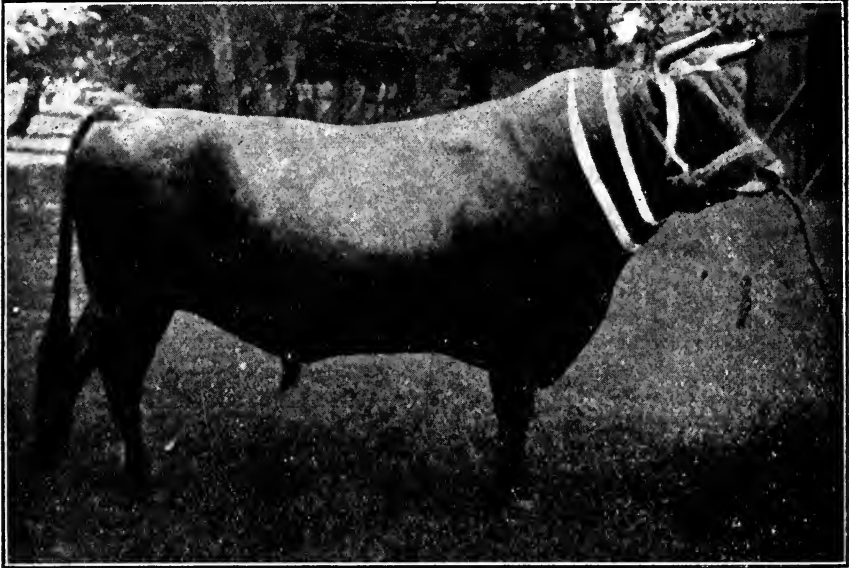
at base and tapering gradually to the point. In his opinion, length of horn should not be considered. Either a cow or bull should measure equally across the hips—from hip to pin-bone, and from hip to flank. If you can get these latter points with a good escutcheon combined, a cow will be perfect in her hind-quarters. Further, he states that there are ten classes of escutcheon, and six different orders, and of whatever class, if of the first or second order, they are good. The escutcheon generally met with are:—Flanderine, selvedge, and curveline, in the Jersey cows. Jersey cows should all have black tongues.

The Jersey bull. The perfect color for a Jersey bull is: fawn back, dark on neck and lower part of ribs; head, fine with broad, dished forehead; throat clean; horns, thin at base, inclined to turn inwards; ears, small and yellow inside; eyes full and large; neck, powerful but not coarse; shoulders fine; chest broad and deep; barrel, round and deep; back, straight and broad across the loins; rump, long and broad, with hips wide apart; tail, fine, long and tapering; skin, thin and soft to the touch; legs, short and straight; tongue and roof of mouth should be black. Great care should always be exercised in the selection and mating of Jersey cattle, in order to keep up a good constitution without deteriorating their dairy quality.

The foregoing was the opinion of Mr. David Hyam, of Nowra, Shoalhaven, in 1898. Since then new breeders have come to the front who claim that white spots on the body, or in other words the broken color of the Jersey, together with a yellow or light colored tongue, with newer notions on the breeding and characteristics of the Jersey, does not indicate impure breeding. My own contention has been that if a family of the Jersey breed of cattle bred true to type and character in 1898 they ought to continue to breed true to type and character. Consequently I wrote Mr. Hyam on the subject this year, 1909, and have his reply as follows:—"I received your letter, and was amused to think that men of but a few years' standing as breeders put themselves forward as experts on the breeding of Jersey cattle. From my long experience (now twenty-five years) of breeding Jerseys, they should be whole colored, without any white or white tongue, which defects can only come about by bad breeding or accident. A whole-colored bull and cow with black tongue will throw a calf true to type and character. But if the cow should be served by accident by a bull of broken color, such as an Ayrshire, &c., one can never depend on that cow throwing true to type and character again. This is in my experience the cause of broken color, &c. Many years back it was the custom, when a Guernsey girl married a Jersey man, the father gave his daughter a Guernsey cow; this cow was taken to Jersey and mated with a Jersey bull, with the result, the cow being fawn and white, and white tongue, a defect was quickly introduced. The passing of a law by the Jersey breeders does not by any means constitute the right of any man to break the laws of nature and breeding." Mr. Hyam adds:—"The principal reason why broken colored Jersey cattle were brought prominently before the public was when the demand for Jersey cattle became so keen in America the Jersey man having an eye to business, sent out all sorts of colors to supply the demand." Mr. John Farragher, of Greenmount, Candelo, also states most positively that "the purebred Jersey should be free from white, with a black tongue." In fact, his opinion, after upwards of thirty years' experience as a breeder of Jerseys agrees with those of Mr. Hyam in toto.

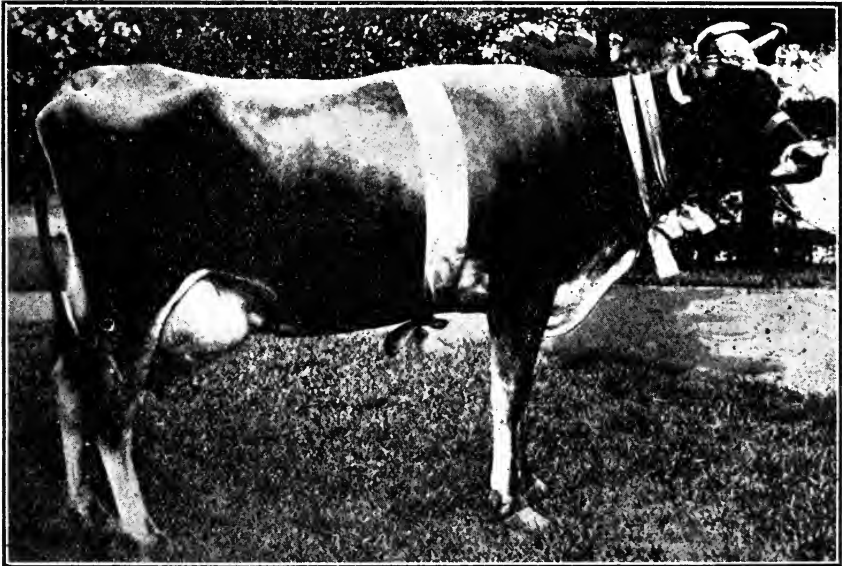
Jersey, one of the Channel Isles, is 150 miles from Southampton, and in sight of the coast of France. Its area is about 28,000 acres. There is a regular service of boats from Southampton, which are comfortably fitted up. They call at Guernsey each way, and as the coast of the islands are crowded with rocks and reefs, navigation is dangerous in foggy weather, a great deal of which falls in the Channel at all times

THE CHANNEL ISLANDS BREEDS.



ERIDGE PARK,

A Model Jersey Bull. Bred by Sir Robert L. Tooth. The property of Mr. David Hyam, Nowra, Shoalhaven, New South Wales. Sire Khedive, by Lucius (imp.), dam Princess.



LADY CLARE,

The property of Mr. T. O'Shea, sen., Toowong, Queensland. By Neatman, dam Rosebud. Rosebud's granddam was by the late Mr. William Inglis' (Sydney, New South Wales) Jersey bull "Freetrader."

Lady Clare was tested by a Queensland Government official from September 19th, 1901, to July 18th, 1902, producing 10,528½lb. of milk, which, with a 15 per cent. cverrun, produced 545½lb. of butter.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

of the year. These islands are famed for their vegetables and flowers, and Jersey in particular for its potatoes. There are acres and acres of glass on these islands, under which flowers and vegetables are forced to catch the early markets of Britain and France. Potatoes are sent across in casks like cement barrels, padded well on top with green grass to keep moist; while vegetables are sent in small baskets. The climate is beautifully mild, and as the soil is rich and the rainfall good, luxuriant growth naturally follows.

There are about 20,000 Jersey cattle on the island, no other breed being allowed on it. Little groups of from five to twenty can be seen contentedly grazing on the little farms all over the island. All cattle and horses are tethered while at pasture, and are moved about the pasture four or five times a day. They are milked thrice daily in the field. The cattle are all as quiet as sheep, and treated with the utmost kindness. The greatest care is taken in breeding, and the majority of the male stock are slaughtered—or, rather, nothing but the best strains of male cattle are kept.

There are judges in the island who do not mind white on the Jersey, and although a whole-colored beast is preferred, white by no means condemns an animal for sale purposes. The great excellence of the Jersey as a butter producing cow is well known, and generally conceded, and has been recognised as a hereditary trait, probably inherited from progenitors bred a century previous for no defined purpose.

Professor Long, writing on the modern Jersey, says:—"The Jersey has enjoyed a popularity which has not been exceeded by any other cow among the dairy breeds. It has been alternately lauded and abused—lauded sometimes beyond its merits, and abused by those who have not had a fair experience of the breed. Until recently the Jersey was estimated, even by those who understood it, as a 'gentleman's' cow, whatever that may mean; but it has distinctly proved itself to be a strictly economical breed when it is well selected, well fed, and well managed. There is certainly no cow which, under fair conditions, is more profitable to the butter-making or cheese-making farmer. Briefly, the economical points of the Jersey are its production of rich milk, rich waxy butter, and exceptionally rich cream and rich cheese. The adjective is applied in each case advisedly, for with the exception of the Guernsey, which closely approaches it, there is no other variety of cattle in the world which produces either cream milk, butter, or cheese either so high in color or so rich in quality.

"The Jersey is often held to be a delicate cow, but this is not the case; she succeeds in Scotland, and in one of the coldest parts of Canada I have seen her thrive as well as in Jersey itself. The island, however, is the place to see the Jersey in its glory. She is smaller, it is true, but she is more slender and more beautifully proportioned.

"The Jersey varies in color from golden-fawn to mulberry, while she embraces a number of shades which are affected more or less by the introduction of grey; practically the colors are fawn, golden-fawn, silver-grey, and mulberry. Sometimes these colors are splashed or broken with white. The Jersey possesses a delicate thin skin of extremely soft texture, and in no part is it more mellow or silky than upon the udder, which is improving in form, for it is not quite so globular as it might be. The cow is not a well-fleshed animal. While bright and healthy in appearance, the skin is apparently drawn over a frame scantily fleshed, but beautifully proportioned. Naturally the majority of the cows are far from perfect, but the imperfection is generally in the hindquarters, the tail being set on too high, while the hips are not wide enough apart, nor do the buttocks permit of sufficient expansion of the udder. The Jersey has a black tongue, black nose, and black points generally; while her skin is yellow, sometimes a rich orange, somewhat oily withal. The horns are crumpled, or going forward, and then curved inwards. In very choice animals they are ex-

THE CHANNEL ISLANDS BREEDS.

tremely fine, yellow at the base, and black towards the point. The forequarters are slender, the shoulder being almost imperceptible; the ribs are fairly well sprung, the back straight, and the loins deep, but there is a cavity between the forepart of the udder and the base of the abdomen which breeders as a rule would like to fill up with a more extensive milk vessel."

Sturtevant says:—"There is no animal which tells more of high breeding than an Alderney, or rather Jersey-born cow. There is a refined air and carriage, a certain comely 'presence' which would forbid all thoughts of the butcher, and never carry one's appetite beyond a syllabus of thin bread and butter. Beyond a peculiar wild, wicked eye, there is not much to admire in the head of an Alderney bull, and even the cows lose much of their graceful character when bred away from the Isles."

Mr. Wilson, who had considerable experience in the breeds of British cattle in 1850, says:—"The crumpled-horned or Alderney cattle are constantly imported to Britain from the Channel Islands, Normandy, and adjacent parts of the French continent; yet though brought from so many districts are always popularly called Alderneys. They are somewhat extensively diffused in Hampshire, but they exist in other British districts only in gentlemen's parks and pleasure grounds, and they seem ill adapted to the climate of Scotland or of the extreme north of England. They are small in size, very ill-shaped, and almost destitute of some of the best points of cattle character; but their milk is surpassingly rich, and yields more butter in proportion to quantity than that of any other kind of cow; and partly on this account, partly for fashion's sake, they are generally esteemed as occupants of fine parks."

Mr. Parkinson says:—"They are of as bad form as can possibly be described; the bellies of many of them are four-fifths of their weight; the neck is very thin and hollow; the shoulders stand up, and is the highest part; they are hollow and narrow between the shoulders; the chin is nearly without flesh; the hocks are narrow and sharp at the ends; the rump is short; and they are narrow and light in the brisket"—and "when viewed from behind," says another writer, "their body appears like two boards nailed together—as thin as a lath." "Their skin is very thin and papery; their hair is short and smooth; their cast of countenance is timid; and their colors, for the most part, a light-brownish-red, mixed sometimes with white, and sometimes with white and dun." These remarks, made, as they were, upon the Alderney, or Jersey, of over fifty years, may have been made in all good faith; but, nevertheless, the Jersey seems to have outlived all her critics, carrying with her every handicap that Nature could place on her general appearance—when judged by those who are constantly in search of cows embracing beauty and quality.

Mr. Martin, who was one of the scientific officers of the Zoological Society of London, and whose elaborate work on the ox was published prior to the great improvement in cattle raising in the Channel Isles, says:—"Under one head we will range the Normandy, Guernsey, or Alderney cattle, which, though originally from the French Continent, are now naturalised in our land. These cattle prevail in Hampshire, especially near the coast; but inland are crossed with other breeds, and, perhaps, most successfully with the Devons, both as respects milking and feeding qualities. The Alderney cattle are angular and awkwardly shaped, of small size, thin necked, small boned, with high shoulders, hollow behind, short in the rump, with pendent bellies and a voracious appetite. The cows yield only a small portion of milk, but it is of most extraordinary richness; and, on this account, they are often kept in the parks and pleasure grounds of the opulent, where, we must confess, they are both useful and even ornamental. Their gentleness, their diminutive size, and even their singular contour,

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

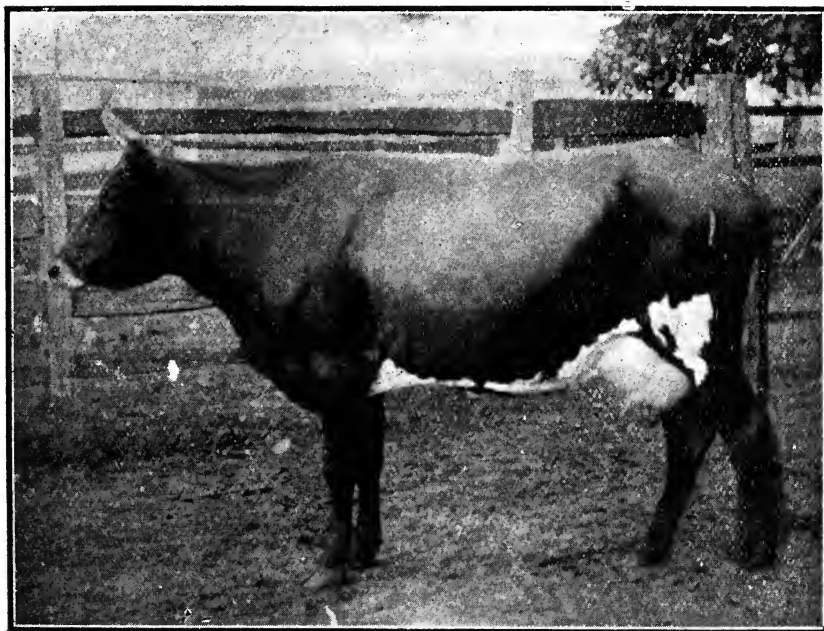
together with the excellence of their milk, render them favourites where no remunerating return for their keep is expected or desired. We own that we admire them ; but, perhaps, some old associations influence our feelings. In proportion to the quantity of milk, the butter yield is astonishing ; a single cow has been known to give 19lb. of butter weekly for several successive weeks. This, of course, is a very rare and remarkable occurrence. The average is from 6lb. to 8lb. or 9lb. weekly during the season, supposing the cow to be first-rate of her kind. The Alderney cattle are generally of a mingled white and sandy-red, or fawn color, the latter being mostly disposed in large, abrupt patches." Since Martin's day vast improvements have taken place, principally owing to the influence of the Jersey Association.

Professor David Low says of the Channel Islands :—"The islands are four—Alderney, Jersey, Guernsey, and Sark—with their dependent islets. The most northerly, and nearest to the coast of France, is Alderney, which is well protected by its rocky shores and dangerous currents. The most westerly is Guernsey, which is the least fertile in soil ; and the smallest is Sark, which consists of a beautiful table-land, scarcely accessible from the sea, and capable of being defended by a handful of men. The largest, richest, and most populous is Jersey, lying about six leagues from the coast of France. When viewed more near all the surface of the country is seen to be intersected with innumerable banks of earth, covered with trees, and verdant with the leaves of bushes and the creeping ivy. There are the divisions of the numberless little fields and possessions of the inhabitants, into which, as an effect of the old, Norman law of succession, enforcing an equal division of land amongst the children of a family, the whole country has been partitioned. All the practices of rural industry in these islands are modified by this ancient institution. The people cultivate cider as the principal subject of export, and fruits of different kinds ; and in an especial manner, lucerne, clover, potatoes, carrots, parsnips, turnips, and cole, for food for their cattle. They cultivate, likewise, peas, and the cereal grains, and reap abundant returns. Their land never lies fallow for a season, but, is either in patches of fertile meadow, kept constantly yielding crops in the manner of a garden. They manure it with the marine plants which grow in great abundance over all their rocky shores. The sea plants thus collected they term 'Vraic,' and used either fresh or burned. The periods and the mode of gathering it are nicely regulated by the insular laws, so that all the people may equally partake of this natural gift of the sea.

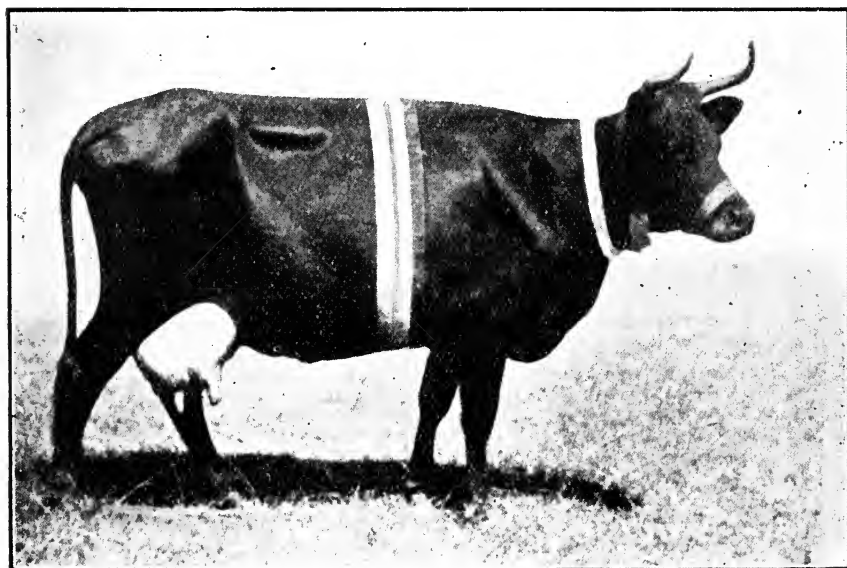
"The cattle of the several islands are essentially the same among the island farmers. They are penned on a narrow space, and shifted to fresh spots of herbage several times in one day, and in the nights of winter she is warmly housed, and, when about to calve, is nourished with cider. Throughout all the year these little cows are to be seen in their patches of meadow, often under the shade of the apple tree, and so fastened that they cannot raise their heads to pull the fruit. In addition to their herbage, they are fed with lucerne, clover, carrots, parsnips, and the large Jersey cole, the leaves of which are stripped off as they grow. A value is here attached to the cow greater, perhaps, than in any other part of Europe. She is the resource of the household for food, and her surplus produce is a part of the returns of every farm.

"The cows of Jersey in a special degree are the subjects of this care, but those of Guernsey deviate from the common type, and present a greater affinity with the races of Normandy, the individuals having more spreading horns, the size being larger, and the form rounder, and the bones less prominent than in the cattle of the other Islands. The true Guernsey has a great resemblance to certain breeds of Norway, which leads to the conclusion that, in the intercourse with the North, which followed the subjugation of Normandy and its dependencies, Scandinavian cattle were introduced into the Islands of the Channel."

THE CHANNEL ISLANDS BREEDS.



Cow Blossom II. Color : Dark Brown and Orange.
Bred by and the Property of Mr. David Hyam, Nowra, Shoalhaven.



Cow Blossom III. Color : Dark Brown and Orange.
Bred by and the Property of Mr. David Hyam, Nowra, Shoalhaven.
(For further particulars see : "Reflections of a Lifetime.")

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Mr. James Long, who ought to know, but who writes through English glasses, writing on the Guernsey, says :—" Like the Jersey, we have sufficient evidence to show that the Guernsey cattle have not only immensely improved during the past few years, but that they are amongst the most prolific and economical in use for dairy purposes."

At the same time, these descriptions do not entirely represent the actual capacity of the breed. The collection of Guernseys at the Chicago World's Fair—good as it was—was not what it might have been; and the same remark applies to many of the collections which were seen at English shows, few of which are seldom seen in public. As a matter of fact, the show Guernsey, like the show Jersey, is not always the best milking animal. At Chicago the twenty-five selected cows were not the best America could produce, inasmuch as their owners had refused to part with their choicest cattle; but they were fairly representative of good animals of the breed. The Guernsey is an animal of a bulkier, and, shall we say, of a more massive type than the Jersey. Her color is orange or orange and white. In weight she averages about 1000lb. To be exact, however, would require very nice degree of calculation. The average yield of milk of the Guernsey has been placed at 550 gallons, with a percentage of about 4.50; the quantity and quality of the milk, however, varies, and a strict average can only be placed after covering a large number of tests.

The points for and against the Guernsey are practically the same as those we have enumerated in connection with the Jersey. The milk, cream, butter, and cheese are all exceptionally rich, while the color is high. The cow is extremely docile and presents a very handsome appearance, although we may be pardoned for saying that she does not equal the more fawn-like animal, either in form or color. Like the Jersey, too, the Guernsey cow is not easily fattened, nor are the calves so saleable, unless taken in hand and allowed all the milk they will consume, until they are ready for the butcher. The Guernsey has a white nose and tongue, light-coloured horns, a heavier front than the Jersey, a soft skin, somewhat greater width across the loins, well-sprung ribs, and depth of both carcase and hind-quarter.

Guernsey cattle were imported into New South Wales from time to time, under different names, such as the St. Hellier breed, and the Hampshire breed. It has over and over again been hinted that Mr. William Howe, of Glenlee, who is generally recognised to be the first to establish dairying on a practical basis in Australia, some time about 1820, used Guernsey bulls in his herd, which is probably true; but we have undeniable evidence that Mr. Howe purchased both Durham and Devon bulls, at the time his herd was most celebrated for its dairy quality. Mr. Michael Hindmarsh, of Gerringong (Illawarra) bought two dairy-bred bulls from Mr. Howe, of Glenlee, one in the beginning of the forties, and the other a few years later. They were ill-shaped animals, mostly white, with large, yellow spots on the body, and yellow cheeks. Neither of these bulls gave much satisfaction. It is just possible, however, that neither of these bulls were pure bred, or representative of Mr. Howe's best stock, as the difficulties of inspection before purchase, were numerous in those days, and the buyer had to accept whatever was sent along. It is difficult to say whether Mr. Edward Larkin, who lived near Appin, and who possessed good Alderney cattle—supposed by some people to be Guernseys—did not have a mixture of Devon blood in his strain of cattle, as the time Mr. Larkin was breeding dairy cattle in this colony, the Devon-Alderney cow was being much admired in parts of England for the dairy. According, however, to the best authorities, who wrote in those days, they all describe Mr. Edward Larkin's cattle as Alderneys, which, no doubt, they were.

CHAPTER VI.

ON WHITE CATTLE IN GENERAL.

There is an old adage, "WHEN DOCTORS DISAGREE, WHO IS TO DECIDE?" Now, we are in nearly the same position with regard to the origin of the wild white cattle of the old world. If we refer to the exhaustive works of Buffon, Low, Owen, and Darwin we will soon find ourselves away back in the mists of ages without being then in a definite position to decide for ourselves how this or that breed of domesticated cattle carry with them all along the line of march such marked and distinct characteristics. Professor Seyffert, however, comes to our assistance. He seems to fall in with the idea that all our breeds of cattle came originally from one race, which is named "Bos Primigenius," and that this race, probably divided under primitive systems of domestication into two other races, named "Bos Frontosus" and "Bos Longifrons." He then goes on to show that the modern classification of the races is derived from various aspects, as he says:—"While formerly there were three principal groups—(a) mountain breeds, (b) lowland breeds, (c) middle or highland breeds, which displayed various bodily shapes, according to their mode of life, dwelling, and work; others have decided the classification by color. In this manner are distinguished—(a) the grey races of Eastern Europe, (b) the parti-colored ox of Central and Western Europe, (c) the black, brown, yellow, to white non-spotted races of Central Europe. Nowadays in some parts of the world, solitary breeds, tribes, and families are named after geographical or political divisions; often enough they are called after quite small breeding places, after districts, valleys, ranges—even after hamlets. In Europe semi-wild cattle are still found in parks; in England, Scotland, and Spain, and other parts of the old worlds. In his treatise on the wild white cattle of Great Britain, the Rev. John Storer, M.A., says:—"The origin of the British white cattle is obscure. On the other hand, local tradition, in many parts of the country far separated from each other, declares some of them at least to be of the aboriginal wild breed of the British forests—an opinion supported by some historical statements and some osteological examinations. On the other hand, the recent inquiries of certain eminent men have led them to doubt the truth of this, and to believe that these cattle were more recently, though anciently, imported from abroad."

He says:—"The universal color of these herds were white; in general pure, approximating, however, in a few instances, to cream color, but with certain points otherwise colored, and these points generally black. The tips of the horns, the muzzle, the circle round the eyes, the hoofs, were in all the herds black; in some the extremity of the tail was of the same color, while the ears of all were either black or brownish-red inside and wholly or partially of the same color outside the ear also. In most of them the front part of the fetlock, particularly of the forelegs, was marked with black, and in all there were a few black hairs on the leg, a little above the hoof. In all of them, too, there was, I believe, a tendency, more or less slight, to produce small black or bluish-black spots on the neck, and even sometimes on the body. All were subject to occasional variations."

I would not have quoted so fully from the Rev. Mr. Storer's work on the exact color of these semi-wild cattle of Great Britain were it not that his description of those animals corresponds with thousands of animals to be found to-day on some of the large cattle stations in Queensland, and on some of the smaller stations in New South Wales, where some of the purest and best types of Shorthorns are bred. To such a great extent has this "crying back" to color exerted itself

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

that several of our best breeders have been compelled over and over again to smuggle in Devon bulls in order to deepen the light roan colors that were fast reverting to pure white.

To again revert to the Rev. Mr. Storer. He says:—"In entering upon the subject of white in cattle, especially as regards domestic races, I am quite aware that I expose myself to many adverse opinions, for on this point, 'SO MANY MEN SO MANY OPINIONS'; but it is a subject into which I am compelled to enter, for its color has always been the prime distinguishing characteristic of the white forest breed of Great Britain. That color, retained universally, and for so long a time, plainly indicates its antiquity, and may perhaps give some clue to its origin. I fear I shall shock the breeder, English, Scottish, or Welsh; for he for ages has been endeavouring to eradicate white, and to breed his cattle black, red, or only with so little white as may be necessary to produce a white face or a body slightly flecked with this color. From Land's End to John o' Groats, from Yarmouth to Haverfordwest—and you may cross over the Channel and take Ireland, too—the white cow is despised and charged with delicacy; yet here are these ancient British herds—some wild, some domesticated—exposed to many hardships and vicissitudes of cold and tempestuous climates, but all hard as iron, vigorous—and white.

"Mr. Darwin, writing on this particular subject, concludes that facts show that there is a strong, though not invariable, tendency in wild or escaped cattle, under widely different conditions of life, to become white, with colored ears."

"In Hungary," says M. Gayot, "the forces of Nature have not yet been turned out of their course by the action of man. To this circumstance that country owes the preservation of a race of large cattle, highly characteristic, constant in type, and so distinctive that they have been habitually considered the prototype of the species, as the head or mother race of all others."

Mr. Marshall, who wrote the rural economy of Yorkshire in 1756, speaking of white cattle, says:—"A calf entirely white is generally rejected, under a notion that white cattle are of a tender nature; that they are peculiarly subject to lousiness and that they are disliked by their associates." He goes on to say:—"The finest ox I ever saw of the Teeswater breed was white. One of the finest cows now in the Vale of Yorkshire is white. Nevertheless, valuable calves are annually sent to the butcher merely because they are all white. Yet the smallest speck of color, even the tip of the ear, red or black, saves them from proscription—under a notion, no doubt, that it hardens their nature, defends them from lice, and renders them acceptable to their companions—a vulgar error, which is not confined to this country, but which ought, in my opinion, to be expelled from the minds of breeders." This writer (Marshall) becomes more and more interesting to us, as he lived and gained his information at a time when the present breeds of beef cattle were being evolved out of the milking herds of Great Britain and Ireland.

Mr. Lewis Allan, who was editor of the American Herd Book, has gone to no end of trouble to dispel from our minds the theory put forth over a century ago that the Teeswater Durhams had a large sprinkle of the wild white cattle of Chillingham Park in their veins. He says that the earlier animals of the improved breed were red of different shades, red and white, pure white, frequently white on the back with roan necks and heads, and roan or red and white intermixed over the body, or in patches, with either more of red or white prevailing. He lost sight, however, like most writers of his day, of the marked distinction between the old Teeswater Durhams and the modern Shorthorns.

But to return to the white as a despised color in Shorthorns. One of the best bulls owned by Mr. Bates was white. He refused several thousand pounds for this animal when it was up in years. Many of

ON WHITE CATTLE IN GENERAL.

the best families of Shorthorns throughout the world can be traced to an individual white bull or cow.

Coming nearer home, among the herds we have either seen or heard of in our time, and let us see how frequently white or almost white bulls have played important parts in the history of dairying in New South Wales. Early in the thirties of last century the Segenhoe Estate people imported a white bull named "Comet" into the Hunter River district. Many of his descendants found their way into the Illawarra district, and their progeny were noted milkers. About the same time Mr. John Berry imported a white bull of the "Comet" breed to Shoalhaven. This bull was driven overland from Sydney, and rested for several weeks with Mr. M. Hindmarsh, at Gerringong. This bull is mentioned as being one of the best dairy bulls ever landed in New South Wales. The best dairy bull ever owned by Mr. Charles Throsby, of Bong Bong, was white, and was imported by the Australian Auction Co. The best bull for dairy purposes owned by Mr. Henry Osborne, of Marshall Mount, was white. This animal was also imported by the Australian Auction Co. Nearly all the best sires and dams from this bull were either white or light roan in color. In order to deepen the color he used a red Lincoln bull. This animal resembled the Devon in color, but favoured of the Shorthorn in size and form. Of the descendants of the celebrated H.O. brand it is needless to speak. Four of them may be mentioned—namely, the cow and bull exhibited by Mr. Osborne at the first show held in Wollongong. The cow was a strawberry roan, and exhibited suckling four calves. The bull was also a strawberry roan. Four bulls from the original white bull were white, one owned by Mr. Somerville, of Dapto, one by Mr. Armstrong, near Albion Park, one owned by Mr. Wilson, of the same locality, and one owned by my father. My father's bull was white, with a few bluish patches about the neck and head, and dark ears. All these bulls proved to be sires of very high merit for dairy purposes, being deep milkers and good doers.

The best bull imported by Mr. Alexander Berry to Coolangatta was a white bull. This bull was at Coolangatta at the time of the Rev. Mr. Townsend's visit to Shoalhaven in 1848. Mr. Berry called him "Ella," and he was a great acquisition to the Berry Estate stock, and his progeny was much admired by Illawarra men. The best bull imported to Illawarra in the late thirties by Mr. David Johnston was a light roan bull at his estate, Terry's Meadows, and Mr. Johnston called him "Erasmus." This bull left his mark on many of the early herds of Illawarra. Mr. Johnston had also in the forties a white bull—a twin—bred by Mr. Henry Osborne, of Marshall Mount. His twin brother was purchased by Mr. Charles Throsby, of Bong Bong, and was also white. Both these bulls were excellent sires; their progeny were excellent. Mr. John Terry Hughes also had a light roan bull in the early forties at his estate, Terry's Meadows, that produced good stock.

The ITH brand, used by John Terry Hughes in those days, branded more Longhorns for his estates on Monaro than Durhams. Many of these Longhorn-Durham crosses afterwards found homes with the small settlers on the coast, and proved themselves to be the best of animals for the dairy. Of course, the Longhorns in those days, although being an old and distinct breed, were much more pronounced in type than they are to-day. They were darker in color, inclined to yellow and the white on their faces, backs, and bellies was speckled more or less. When boundary fences were erected in after years, breeds, as in the old countries, were kept separate. Then all bald-faced cattle were put to imported Hereford bulls, and a new breed established. The same with the Shorthorn, Ayrshire, and Devon breeds. Some few breeders retained the red Lincoln until it became absorbed by the Shorthorn breeders; others retained the Guernsey until it was absorbed by either the Ayrshire or Normandy cattle. Marsden's polled

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Suffolk Dun, red polled Norfolk held their own in the battle of the breeds and the colors for many years in the colony.

Notwithstanding all these instances which we have gone to the trouble to point out where white bulls have proved to be of undoubted worth, yet even to this day that color is despised by breeders. We can remember when very few dairies in Illawarra or Shoalhaven were not supplied by milk pumped by willing hands in streams from one or more black polled cows in the herd. We can all remember the ballys, the blacks, the browns, the brindles, and old Sir John Robertson's remainders. But when one turns round about to think, the white calves invariably went to the dogs or the pigs or the Sydney market. One could go farther afield and mention Mr. Greive's herd of Durhams on the Clarence River. That gentleman bred a white bull that had a famous name as the sire of dairy stock as far south as the Wilson and Maria Rivers, where a Mr. Doyle bred valuable dairy cattle from him. Again, let us turn south, and we find that it was an imported white bull that laid the foundation of Wren's Taragando Estate herd. One could go on enumerating case after case where white bulls have done good service, but in only one instance can the writer remember seeing a herd of white cattle. That was on the Dunroon Estate (belonging to Mr. Campbell), situated in the Queanbeyan district. A Mr. Tully was in charge, and he was an admirer of white cattle. The battle or fads of the colors, however, must not be considered a modern invention, like the battle of the breeds, as we read in Virgil, who wrote during the time ancient Rome held sway over the nations of the earth. In recording a contest between two rival lovers he says (Pastoral iii., page 10):—

“ To bring it to the trial will you dare,
Our pipes, our skill, our voices to compare ?
My brinded heifer to the stake I lay :
Two thriving calves she suckles twice a day.
And twice besides her beestings never fail,
To store the dairy with a brimming pail.
Now back your singing with an equal stake.

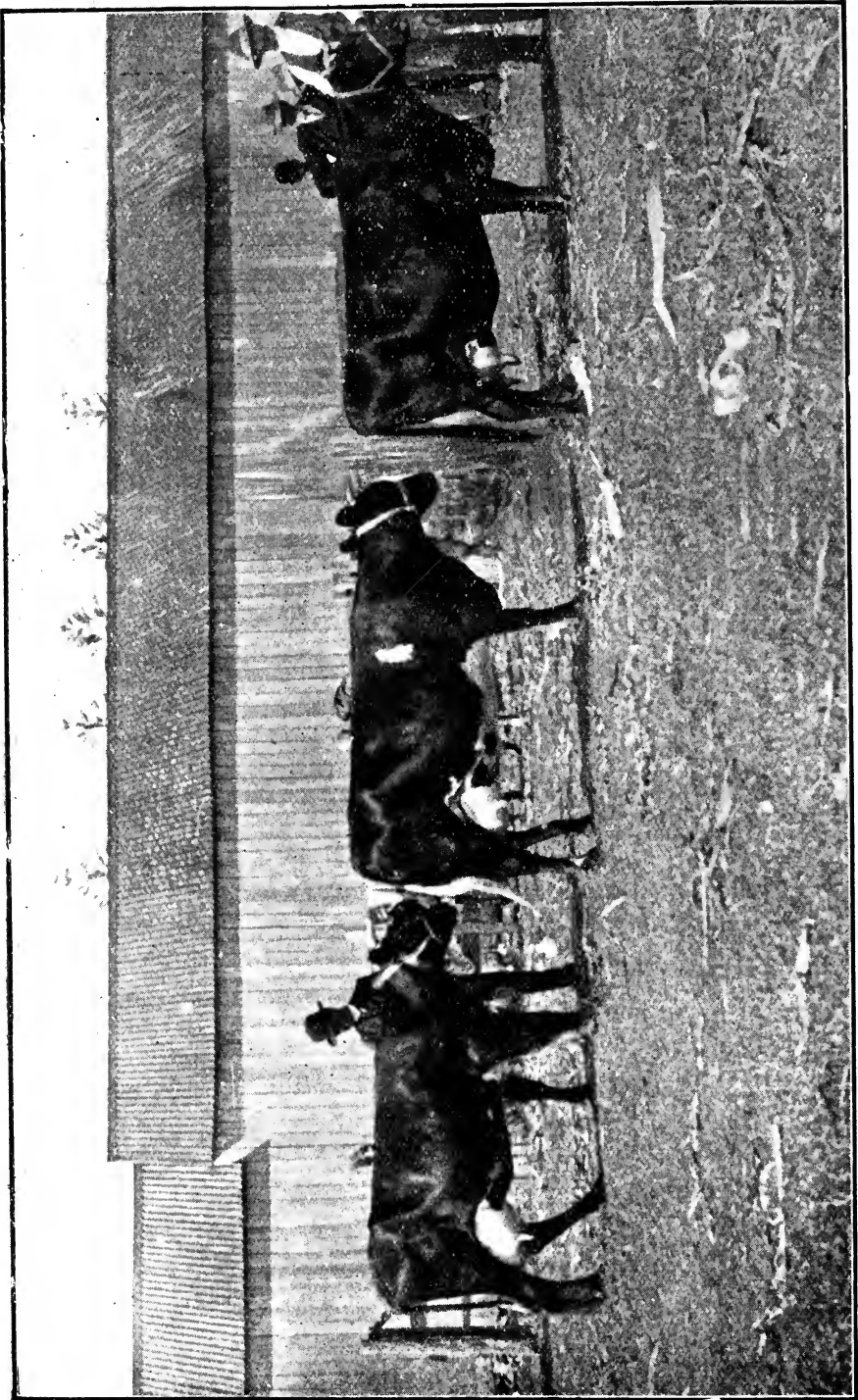
Again Virgil speaks of the white steer used for sacrificial purposes when he says (Aeneis viii., page 384) :—

“ An animal off'ring in the grove shall b'eed,
A snow white steer, before thy altar led,
Who, like his mother, hold's aloft his head
Butts with his threat'ning brow, and bellowing stands,
And dares the fight, and spurns the ye.low sands.”

In the Al Koran we read:—“ And when Moses said unto his people, ‘ Verily God commandeth you to sacrifice a cow,’ they answered, ‘ Doth thou make a jest of us ?’ Moses said, ‘ God forbid that I should be one of the foolish.’ They said, ‘ Pray for us unto the Lord, that He would show us what cow it is.’ Moses answered, ‘ He sayeth she is neither an old cow nor a young heifer, but of middle age between both ; do you therefore that which you are commanded.’ They said, ‘ Pray for us unto thy Lord that He would show us what cow it is and what color she is of.’ Moses answered, ‘ He sayeth she is a red cow, intensely red, her color rejoiceth the beholden.’ They said, ‘ Pray for us unto the Lord that He would further show us what cow it is, for several cows with us are like one another, and we, if God pleases, will be directed.’ Moses answered, ‘ He sayeth she is a cow not broken to plough the earth, or water the field, a sound one, there is no blemish in her.’ They said, ‘ Now hast thou brought the truth.’ ”

Probably if we had time to examine the musty shelves of the old bookstalls we would discover that the ancients had mastered those arts in breeding which seem to be lost to us. Thus far we know that for sacrificial purposes at least they bred cattle of one pure color, whether

ON WHITE CATTLE IN GENERAL.



Daisy. Color : Red.
Modesty. Color : Red, white spots. Fussy II. Color : Red.
Group of Three Dairy Cows that Won First Prize Kiama Show, 1909. The Property of Mr. Hugh Dudgeon, Hillview, Jamberoo.
(For further particulars see Appendix.)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES

white, red, black, or yellow. Once admit that these distinct colors existed in many of the herds of those ancient times, and then we can account for many of the varieties and breeds that are being presented to us to-day, the origin of which are lost in antiquity. Unfortunately much of the cattle history of the ancients is very much of the same class of writing, and does not give us much detail. According to Danberry's Lectures on Roman Husbandry, cattle amongst the Romans were merely intended for one single purpose—namely, the labor of the farm, for he says:—"No attempt is made by the *Scriptures Rei Rusticae* to point out the qualifications which characterise the different races, for although Cullumella distinguishes the Campanian from the Umbrian the *Hetrurian* and Latin from the *Apennine* breed—which last, although less comely, was the hardiest of any—he contents himself with quoting from the Carthaginian Mago the following description of a good bullock:—"The oxen we buy should be," he says, "young, square, with large members and lofty horns, black and strong; the forehead broad and rough; the ears hairy; lips and eyes black; noses flat and turned up, with wide nostrils; a long and brawny neck; dewlap large, and reaching down to their knees; chest broad; shoulders large; belly protuberant, with sides well stretched out; flanks broad; back straight and even, or a little declining; hips round; legs compact and straight, but rather short; knee-joints well set; hoofs large; tails very long and hairy; hair over the whole body, thick and short, either red or a dark brown; and the coat altogether very soft to the touch." With regard to the bull, the chief differences from the above are that he is fierce-looking, more lively in his deportment, with a neck more brawny, and so large indeed as to form a large part of his body; and a belly a little smaller in its dimensions than is suitable for an ox. The cow, on the contrary, mostly approved of is of a tall make, long, with a very large belly, a very broad forehead, eyes black and opening widely; horns graceful, smooth, and black; hairy ears, very small dewlap, and tail, hoofs, and legs of moderate size."

As to Virgil, he confines his discourse to the cow, on the ground that the qualities of the offspring depend upon the make of the mother, a notion the truth of which, if not wholly acceded to in our own times, the Arabians at least are fully persuaded of in the case of horses, as appears from their never selling a mare, although they are willing enough to dispose of their stallions. To come nearer home, take, for example, our sheep breeders. Many of them will readily enough sell their purebred rams, but absolutely refuse to part with their purebred ewes at any price for similar reasons.

Now, if we compare the opinions of our modern authorities with those of the ancients just mentioned it will be seen that with regard to the descriptions and qualifications of oxen their opinions are much in common. For instance, Sir George Sinclair says of a bullock: "The chest should be broad, the carcass deep and straight, the belly moderate-sized, the legs short, the head and bones as small as is consistent with health and strength, and the loins and hips broad and full. Virgil's description of the ox is to be found (*Georgics* iii., 51)."

If, as has been shown by the early Roman writers, butter was regarded as a medicine, and not as an article of food, and that flesh or cow's milk was seldom if ever used by the Romans, it is patent that the Celts must have been the early protectors and breeders of cattle in Great Britain and Ireland before and after the Roman invasions. They possessed white, black, yellow, and red cattle, which were admired for their separate purposes. Hence the mixtures of colors in the ancient cattle of Great Britain and Ireland; hence the wild white cattle of England, Scotland, and Wales; hence the large proportion of white in our cattle at the present time.

CHAPTER VII.

WHITE CATTLE.

The Basis of the Durham and Modern Short horn Breeds.

The stockbreeder has something more to do than merely to watch the effect of coupling one animal with another. To rightly fulfil the functions of his calling he must so mate animal with animal as to produce the best possible results, generation by generation, in an ever-ascending proportion. To him are entrusted living organisms from which he is to produce the best possible results according to the natural laws of propagation from other similar organisms, and of such a character as shall conserve every good quality, and as far as possible replace every bad quality with a better one until perfection is reached.

The organisms are probably plastic but the secret of their plasticity is not known to everyone, and to those to whom it is known it is still a mystery, or at least a half-solved riddle, and in proportion of just the ratio of the insight that this or that breeder has into the secrets of Nature will his success as a breeder depend. This insight is, in fine, knowledge, and, like all other knowledge, is power; and he who would possess it must seek for it as for hidden treasures.

There appears to have been a time when men were not ignorant of the value of this branch of knowledge. The earliest written record of our own race show us that certain breeds of cattle were esteemed for certain well-defined peculiarities. It is, therefore, only reasonable to suppose that such cattle were bred with a view to the special production of certain highly-esteemed marks. In proof of this, we read that the Druids used to sacrifice white bulls on their altars; and white bulls were also sacrificed by the Egyptians to Apis. In Italy there was a noble breed of white cattle, the bulls being models of beauty. Herds of this breed were kept to breed and graze in the wild solitudes of the Campagna of Rome, tended by herdsmen. In Hungary there is a breed of white cattle of large size, with long horns; a similar breed prevails in both Russia and Poland, which were much prized.

But why, it may be asked, should white cattle have been possessed and valued since the dawn of the Christian era? On this point both scientists and agricultural writers are very silent, possibly because they have had no information to work on. It is nevertheless true that white, cream, and grey have always been the colors found in scores of instances prevailing among the semi-aboriginal herds of Europe. We have seen that the Celts were in possession of cattle prior to the Roman invasion of Britain. We have also seen that the early Celts used white bulls on their altars for sacrificial purposes. Further, we have seen that large and valuable herds of white cattle were preserved in the countries mentioned for certain purposes.

Walkins, in his gleanings from the natural history of the ancients, says: "Much as Great Britain owes to Rome for her gifts of literature and law, civilisation was even more largely aided by her in the ordinary conveniences of life, as also in the improvements in agriculture and animals and plants." It becomes, therefore, an interesting question, in considering the evidence which yet remain of the material conveniences of life which Rome contributed to Britain—what plants and animals she brought into that island.

Cattle, numerous in Britain previous to the Roman invasion, furnished the people of the island with food in their flesh, and partial clothing in their skins. They were exported to countries abroad, with various other articles of commerce, under the dominion of the

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Romans. At a later period, while the Danes were ravaging England with varied success, under the Saxon rule cattle were brought in from the neighbouring Continent, and also exported from the island. They were kept in such numbers as to be a considerable portion of the wealth of the people. With the dominion of the Normans came the division of the land into great estates, which were given to the retainers of William the Conqueror, and the gradual subdivision and settlement of these estates into farms; the establishment of a tenantry, and, after a long time, an improvement in the system of agriculture. There was little intercourse among the people belonging to the different localities. Roads were few and bad; the tenants mostly paid their rents, taxes, and tithes to landlord, Church, and King with cattle reared on the farms. The surplus were chiefly driven away by dealers who purchased them at the farms, or at the neighbouring fairs. The home herds thus became localised and indigenous to the soils on which they were reared. Hence, in the course of centuries, the people began to look upon their little country as the chief centre of the whole world and their breeds of live stock as the aboriginal race of the island, which had been evolved into the highest order of perfection by their forefathers since the 10th century of the Christian era.

Without any wish to withhold from the cattle breeders of England who lived during that long period—which extends from the 10th to the 16th century of our history, which must have been a slow, tedious form of advancement at best as regards the development of stock, as compared to the vast strides made in that direction during the three following centuries—there is, however, something to be explained away with regard to the origin of the semi-wild white cattle preserved in Chillingham Park in England for centuries.

The Rev. Mr. Storer would have us believe that at Chillingham we might look upon the pure descendants of the ancient *Urus*, and in the Highlands of Scotland upon a living specimen of the ancient *Longifrons*. We would, therefore, in these two cases, have before us animals of almost complete sameness. So much alike are these two specimens that it is argued that while the Ayrshire takes the character of its head and horns from the one, it also takes the well-recognised pinch out of the ear from the other; whilst from the mingling of the white and black colors they get that remarkable "dollar spot." If, therefore, we could accept the Rev. Mr. Storer's theory of the origin of our races of domesticated cattle in Great Britain and Ireland, we need only trace back a little farther, and we would discover the genus *Bos*, which was liberated from the Ark by Noah.

Frennell, in his "Natural History of the Ancients," says:—"I know of no existing wild species which I can refer to as the original type of the common domesticated ox. In many parts of the world there are wild herds, and very extensive herds of the same species; but this we have the testimony of history to prove that they have originated from individuals that had escaped from domestication."

It would therefore, seem to be mere waste of time to attempt, in the absence of any reliable history, to claim for the semi-wild cattle of either England, Wales, or Scotland, date but few centuries posterior to the fifth century of our history, or immediately before the Saxon or Teutonic invasion, when seeking out their origin.

There is no modern breed of cattle so much given to produce colors which correspond with those of Chillingham Park, England, as the Loughorned Durham, a breed that was perfected by Bates and other breeders in the Valley of the Tees (England) prior to the perfecting of the beef Shorthorns. The bulls of this breed had a decided tendency when mated with light-colored cows to produce white calves. This gave rise to the great fancy that set in about this period in other counties in England for

WHITE CATTLE.

the Devon and the Hereford breeds. Even in the County of Durham, England, we find many admirers of the old Holderness and the yellow and white Yorkshire type of Shorthorn, which breed was always used in the London dairies for milk-producing purposes, long anterior to the development of the modern Shorthorn by Messrs. Collings Bros. and Booth Bros. The Holderness, the yellow and white Yorkshire Shorthorn, and the Longhorns produced but few white calves compared with either the Longhorned Durhams or the modern Shorthorn breeds.

Mr. Bailey, in his survey of Durham, published in the year 1808, says:—"Seventy years since (1738) the colours of the cattle of Messrs. Milbank and Croft were white and red, and white, with a little red about the neck." Mr. Culley states that he got similar information from old men who lived about that time, and who had a distant recollection of the cattle in many counties of England.

It must not be forgotten, however, that there has been for centuries a decided prejudice against white animals of every description. It is even plain that among the animals themselves there is a noticeable antipathy shown to any white ones of the same species. But if we follow up the history of the Shorthorn breed of cattle in New South Wales alone, we cannot help being impressed with the fact that white Shorthorn bulls have proved to be equally valuable as sires with any other color of Shorthorn, often more valuable.

Returning once more to the attack on the origin seekers of our various breeds of British cattle—and we must own at the outset of the task that that which we take to be the most orderly plan of enquiry obliges us to face at once the chief difficulty of the whole task. As a result, the first fruits of our research bring us face to face with an irreconcilable difference of opinion between the various schools of naturalists. One tells us that the great long-haired *Bos Urus* is the origin of our semi-wild white cattle; another, that the small, shorthorned *Bos Longifrons* is their progenitors. One naturalist tells us that the *Urus* was black; another, that he was white; while yet another discusses the question, whether the *Urus* was domesticated in Asia only, or in Europe. Whilst, lastly, we find another, who refuses to believe that the *Urus* was ever domesticated by any of the various races of mankind known as civilised or semi-civilised peoples.

Where the difficulty lies with us is the fact that all these different professors are recognised leaders of natural science. If they had all led one way, we might have confidently followed them; but, unfortunately, they do not, and we are in consequence left, to a great extent, in doubt as to whom to follow. The writer cannot get away from the opinion so strongly adhered to by Dr. Smith, of Edinburgh (Scotland), that "the *Bos Urus* never was domesticated." We have, therefore, to look to the Celtic ox—*Bos Longifrons*—for the origin of the semi-wild white cattle of Europe, as also the semi-black cattle of Europe.

Nevertheless, we must respect and duly weigh, if we cannot with unswerving faith follow and accept, the suggestions of these recognised authorities, who were advanced explorers, laborious truth seekers, to whom the world is indebted for much accumulated knowledge and salient thought. If we, therefore, without the aid of a scientifically trained mind, cannot at all times reconcile their diverse teachings, we may, perhaps, from the very diversity which perplexes us gather knowledge of more than one side of each subject, which they, and we, see from various points of observation.

It is probable that whatever part of England that was worth the conquest was invaded, and possessed by the Romans before the Christian Era; it was held by them, so long as they had the power, and until the unconquered spirit of the ancient Britons, after near four centuries of Roman rule, drove the more civilised invaders out, and

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

re-established their own authority. Barbarians when the Romans invaded them—comparative barbarians—still held power over the people when the Romans went out. The adjoining, and even less civilised people of Scotland, were hardly worth a conquest by the Romans, had they sought it. They held their own mountain fortresses, and barren islands, and only suffered by the occasional inroads of neighboring Continental invaders, who long afterwards ravaged England for the sake of plunder, cattle being their chief prize.

With the conquering Saxons, in the fifth century, came into England some better dawnings of civilisation, and progress in the arts of life, until the year 596, which year is ever memorable, being the arrival of St. Augustine in Britain. But it is unnecessary in a work of this nature to touch upon the great work of St. Augustine in Britain. In 1066, William, Earl of Normandy, subdued the inhabitants of Britain in the memorable Battle of Hastings, and after this Norman invasion in the eleventh century, under the rule of William, began a system which has since obtained in England, Scotland, Wales, and Ireland—to wit, landlordism—caused by the division of the lands among the retainers of the conquering invaders. With the dominion of Normans came the division of the land into the great estates which were given away by the Conqueror to his retainers, and the gradual sub-division and settlement of those estates into farms, the establishment of tenantry, and after a long period of this rule, the Great Charter won by the English barons from King John, in 1215.

It is beyond cavil that, with the coming of St. Augustine, Rome again and more powerfully than before, through her missionaries, resumed her sway in humanising the people, and introducing fresh elements of civilisation. From the evidences that yet remain, it is not by any means unreasonable to determine what plants and animals were subjugated and cultivated in England during that period which includes the fifth and the thirteenth centuries of the Christian Era.

Watkins, in his "Gleanings of the Natural History of the Ancients," says:—"The cattle in use during that period, in all probability were the ancestors of the few semi-wild cattle at present living in parks at Chillingham, and a few other localities."

Too much stress has been laid by most writers on the fact, that, among these semi-wild herds found in England, Scotland, and Wales, some are white, others black; whilst even the "polled" and "humlev" species of ox have their representatives in these semi-wild white and black herds, in order to prove a variety of aboriginal origin for the whole group. But Darwin seems to clear away much of the mystery which hitherto hung round the origin of these animals, when he says: "Color is the most fleeting of all our animal characteristics; whereas, one of the most important factors in forming the various varieties of cattle has been almost entirely overlooked, viz., the power of man to seize upon and perpetuate desirable properties."

As regards colour in cattle, scores of instances could be shown where calves from choice cows have been destroyed, on account of a broken color, and when the calves of inferior cows were kept, simply because their colour was fashionable at the time. If the colour line had been drawn with Major and Baronet, those bulls would have gone into the veal market, or, if we were to take "Admiral Roundrib" bred by Mr. Robert McDougall, of Victoria, the property of Mr. Thomas Lee, of Woodlands, Bathurst, got by Master Athelstane (14, 932, C.H.B.), dam Aurora IV. by Fusilier (12,912, H.C.B.), 9, d. (old Aurora), bred by the Circular Head Company, Tasmania, we will discover that this bull was mottled roan, a colour not admired by Short-horn breeders. There are many such instances on record.

When Lieutenant-Colonel Johnston deposed Governor Bligh in New South Wales he ruled for a time the destinies of this country. He was soon, however, recalled to England, and came back Robert Johnston, Esq., and settled on his estate, Annandale, near Sydney. His

WHITE CATTLE.

friends in England immediately afterward sent him a present of a consignment of choice Durham cattle, which he depastured on an estate of 2000 acres near Parramatta that he had obtained by firing a few pistol shots during a riot, extravagantly termed "the Irish Rebellion of Botany Bay." These were the cattle he sent to Illawarra in 1816, which were so much prized in the past by many of the early pioneers. Many of these animals reverted back to white, but were prized just the same.

One could go on enumerating instances of the white Shorthorns if it was necessary; but it is just as well to state that in most cases, where good results have been obtained from a dairyman's point of view, the bulls were not milk-white. As a rule, the most favored white bulls had a yellow skin, with the hair full of yolk, with blue-roan patches on the neck and about the head, or, perhaps, distinct brown, red, or blue spots about the neck, cheeks, and red inside the ears.

Shorthorns of the above description were not considered pure bred by the breeders of the early seventies, and in consequence, they were passed out; probably never to be revived again. The same may be said of the Rev. Parson Marsden's cream and dun-colored polled breed. Many of these cows were bred white, with pale yellow spots, and had also small horns that were loose on the head. The horns hung down, held by the skin to which they were attached. The cows were called snail-horned, or humlies. Dr. McKenzie had many of these on his estate, in one of the Shoalhaven valleys, from whence they were often driven north to the more northern districts, and sold to the dairy farmers, during the fifties and sixties.

Notwithstanding, however, that in Africa a large percentage of the various Buffalo breed of cattle are of a whitish or cream colour, the moment Shorthorn breeders notice a Shorthorn bull throwing white calves, there is another introduced instead, as a rule the Devon.

Among the objections that have been urged against white cattle, it has been stated that they cannot withstand our climate, and are not prolific. This may or may not be true as regards extremely hot climates, as our experience does not extend to tropical regions. But if we first take the white Shorthorns of England, and compare them with our Australian Shorthorns, we will find that these charges cannot be substantiated generally. With regard to England, there is an undoubted record that the ancient Studley Royal breed, preserved by the Aislabie family, was a white breed, together with the distinct existing evidence that the Shorthorns are largely indebted to that breed, as one of the main foundations of their race. These facts, under ordinary circumstances would be held as sufficient evidence to account for the tendency of the Shorthorn to revert to white, under so many varying conditions.

Setting aside the white breeds of other countries, which do not appear to be discarded, on account of quantity and quality of production, or lack of hardiness, and taking a glance at our Shorthorns, with and without pedigree, one cannot remember ever having heard of tests being conducted to prove any of the charges against the white colour in cattle. From my own observations, extending over forty years, many of those years being spent visiting some of the best Shorthorn herds in Australia, and also the dairy farmers' herds, I do not remember meeting with any proofs sufficient to support sweeping charges being levelled at white Shorthorn cattle, outside the common, every-day expression, "We don't like them." Take up Coates' "Herd Book," and we find "Pearl," the foundress of the Pearl tribe of Shorthorns, "Fair Frances," from which the celebrated "Comet" descended; "Miss Rose," from which "Moss Rose" descended; and last, but not least, "Old Sweetheart III.," one of the finest Shorthorn cows ever raised in England. These three cows were white, yet they were both prolific and hardy—that is to say, they all three propagated sufficient offspring to be designated tribes.

CHAPTER VIII.

HOLLAND CATTLE.

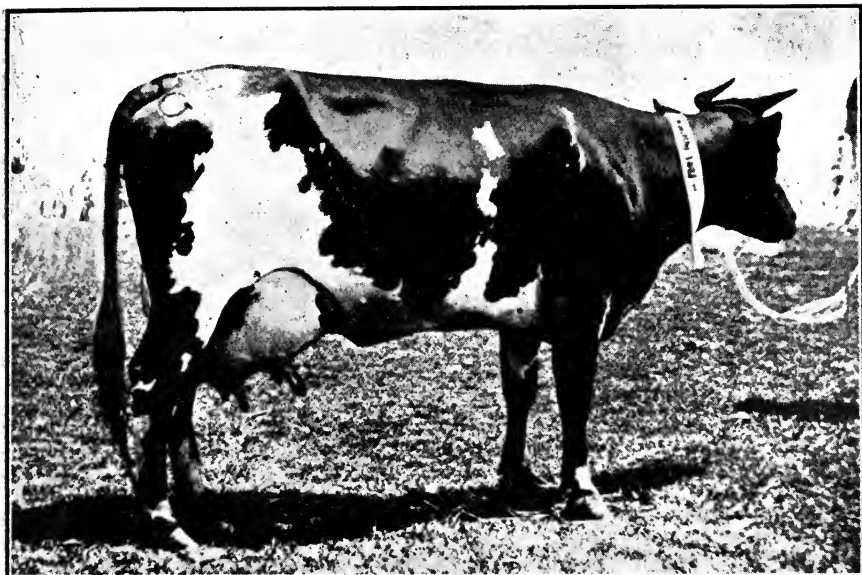
"Dairy farming," says an interesting traveller, "became a highly important branch of industry at a very early date in Holland, and a large and valuable race of dairy cattle existed there long before the efforts of modern breeders began in England, the attention of farmers being for a great number of years devoted especially to the dairy, and the manufacture of butter and cheese. They used to support themselves to a considerable extent upon this branch of farming, and hence it was held in the highest respect, and carried to a greater degree of exactness and perfection, perhaps, than in any other country in the world. They were especially particular in the breeding, keeping, and care of milk cows, as on them very much of their success depended. The color of the early North Dutch cattle was mostly variegated. Cows with only one color were not favoured. Red or black, variegated, gray and blue variegated, roan, spotted, yellow and white variegated, were especially liked.

"The principles on which they practised in selecting a cow to breed from were as follows:—Should have considerable size, a finely-formed head, with forehead or face somewhat concave; clear, large, mild, and sparkling eyes, yet with no expression of wildness; tolerably large and stout ears, standing out from the head; fine, well-curved horns; a rather short than long, thick, broad neck, well set against the chest and withers. The front part of the breast and the shoulders must be broad and fleshy; the low hanging dewlap must be soft to the touch; the back and loins must be properly projected, somewhat broad, the bones not too sharp, but well covered with flesh. The animals should have long, curved ribs, which form a broad breast bone; the body must be round and deep, but not sunken into a hanging belly; the rump must not be uneven, the hip-bones should not stand out too broad and spreading, but all the parts should be level and well filled up; a fine tail, set moderately high up and tolerably long, but hanging down below the hocks; the legs must be short and low; but strong in the bony structure; the knees broad, with flexible joints; a hide covered with fine glossy hair, must be soft and mellow to the touch, and set loose on the body. A large, rather long, and loose udder, extending well back, with four long teats; large and prominent milk veins, must extend from the navel back to the udder; the belly of a good milk cow should not be too deep or hanging. There should be no white below the knees or hocks.

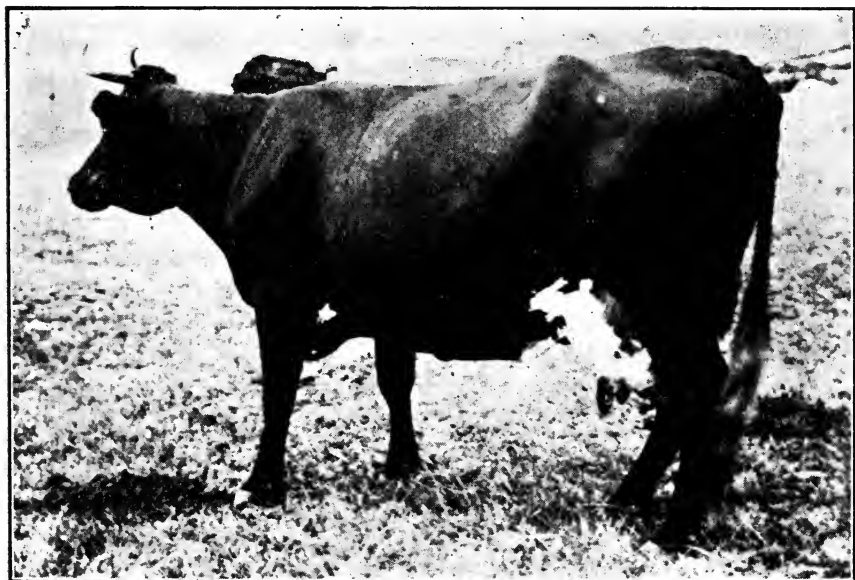
"The practice in Holland is to remove the calf from the mother even before it has been licked, and to take it into another building out of the cow's sight and hearing, put it upon soft dry straw, and rub it dry with some hay straw, when its tongue and gums are slightly rubbed with salt, and the mucus and saliva removed from the nostrils and lips. After this has been done the calf is made to drink the milk first taken from its mother. It is fed at first from four to six times a day, or even oftener; but soon only three times, at regular intervals. Its food for two or three weeks is clear milk, as it comes warm and fresh from the cow. This is never omitted, as the milk during the most part of that time possesses certain qualities which are necessary to the calf, and which cannot be effectually supplied by any other food. In the third and fourth week the milk is skimmed, but warmed to the degree of fresh milk; though as the calf grows a little older the milk is given cold, or about 80deg. Fahr.

"At three weeks old, or thereabouts, the calf will begin to eat a little sweet, fine hay, and potatoes cut fine, and it very soon becomes accustomed to this food. Many now begin to give linseed meal mixed

HOLLAND CATTLE.



Cow, Lucky of Oakdale. Color : Red and white.
Bred by and the Property of Mr. George Tate, Oakdale, Kangaroo Valley.
(For further particulars see Appendix.)



Cow, Perfection. Color : Red, with White Flank.
The Property of Mr. Moses King, Curramore, Jamberoo.
(For further particulars see Appendix.)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

into hot water, to which is added some skim milk or buttermilk, and others use a little bran cooked in hay tea, made by chopping the hay fine and pouring on boiling water, which is allowed to stand a while on it. Others still at this age take pains to have fresh linseed cake, broken into pieces of the size of a pigeon's egg, putting one of these into the mouth after the meal of milk has been finished, and when it is eager to suck at anything in its way. It will very soon learn to eat linseed meal. In this manner the feeding is continued from the fourth to seventh week, the quantity of solid food being gradually increased. In the sixth and seventh week the milk is by degrees withheld, and water or buttermilk used instead; and soon after this green food may be safely given, increasing it gradually with the hay to the age of ten or twelve weeks, when it will do to put them upon grass alone, if the season is favourable to it.

"Calves should be gradually accustomed to all changes, and even after being turned to pasture they ought to be taken in if the weather is not favourable to their comforts."

Manning says:—1. That the Dutch or Holland cattle date further back than that of the Holstein. 2. That the Holstein cattle descended from the Dutch. 3. That the name of Holstein cattle is only a local appellation for a peculiar indigenous breed, constituting only one or several appertaining to the same group—namely, the group of Lowland races, of which the Dutch breed is the fundamental type. According to the *Allgemeins Dutche Real Encyclopedia*, the original Holstein Schleswyck lies buried in obscurity, and Holstein was probably visited by the Cimbri; while a century after the Roman Emperor Tiberius Caesar arrived with his army and fleet before the mouth of the Elbe, without, however, setting foot on the Holstein shore. According to Tacitus, it may be stated that the Holstein Baltic coast was inhabited as far as Mecklenberg and Schleswyck by seven small German tribes, of whom the Angles and Warnes have preserved their names down to the present time; while the others have been melted down into that of the Saxons. In the fifth century the Saxons and Angles united into the Jutes and Friesians, and migrated to England (This is Low's colonisation.) Subsequently the Holstein-Saxons who dwelt to the north of the Elbe were called by the name of Norsmen; while the name of Holstein is not mentioned in history before 800 years after Christ. In 1128-64 the Holstein province Vadvrien was conquered and converted to Christianity, and partly peopled with strange colonists from Friesland, Holland, and Westphalia."

From an historical point of view it is not necessary to follow Manning further in his line of argument; but he seems to have good argument on his side when he states: "The question is whether it is tenable to give to one variety of cattle the name of an entire group, and to reckon as appertaining to it all its several varieties or breeds—as, for instance, the Dutch, Friesian, Oldenburg, and Holstein; and would it not be imperative in such a case to give it the purely historical name by which it is generally known? If it could be desirable to give a general name to the cattle of the just-mentioned districts, then that of Holstein cattle would not be appropriate, and for it should be substituted that of Friesian cattle, whence all the varieties originated. The chief characteristics of the Friesian breed are its eminence in giving and fattening qualities. We find in all the just-mentioned districts, and extending still further southward, these combined characteristics, with this difference, however, that wherever the land is more fertile, the climate milder, and the tending, feeding, and breeding of the cattle observed with more care in that measure, and according as these requisites stand to each other in the closest proportion and harmony, they are more developed, attain larger size, and are of a finer texture. It, therefore, the intention be to convey a correct understanding of the true qualities of the several varieties or breeds mentioned in their own dwelling places, it is better that each breed should retain the name by which it is known, and that no collective name, though a historical one, should be given them."

HOLLAND CATTLE.

According to the "Dutch Freisian Herd Book," the Friesian has been stock, sending out branches all over the Lowlands of Northern Europe. The Oldenburg breed, the Breitenburg breed, the black and white cattle of Flanders, have all sprung from it. As a central stock, mainly bred in Friesland and North Holland, it has always maintained its pre-eminence, and from it is continually drawn the elements for the improvement of other breeds. Probably there is no other breed or race of cattle that has received less admixture of other blood during the long period which it has been under review. Yet it cannot be denied that admixture from other races has taken place. The ravages of war and disease have sometimes compelled importations to replenish the depleted herds. At such times resort has been made to French and German breeds. English breeds have also been introduced to a limited extent. About 1875 there were two associations of breeders established in Holland, and a class of superior cattle selected and registered as foundation stock. In the beginning neither association made any distinction in colors, regarding all as equally pure. The Friesian Association advanced the classification of colors, adopting variegated black and white as a distinct and separate class. Indeed, it is only within a very recent period that the Dutch breeders appear to have given any special attention to the matter of color, selections having been made regardless of the color of the hair.

The Friesian breed of cattle have been imported from time to time into New South Wales from the first commencement of the settlement. But, strange as it may seem, our history writers have almost without exception confined themselves to describing their colors only. For example, the Messrs. Shipley, of Bong Bong, possessed some of them, and were described as Shipley's blue-roads. The Messrs. Berry had a herd of the breed at Coolangatta, Shoalhaven, and they were described as Berry's magpie cattle. It was not till the late T. S. Mort introduced them to Bodalla, Moruya, that they became recognised as the Holland or Friesian breed of cattle.

CHAPTER IX.

THE IRISH BREEDS OF CATTLE.

Including the Kerry of Modern Times.

When treating on the cattle of ancient Ireland, one has to be careful of one's statements, although most writers seem to think that beyond the Kerry Mountains there were no other parts of Ireland possessed of domesticated cattle. This opinion is largely shared by writers unacquainted with the nature and character of the Irish race, and the wonderful advancement which they had obtained in science and art during that great period of learning, extending from the 8th to the 13th century of the Christian era.

Professor O'Curry, who is recognised as being one of the first to reveal to us the secrets contained in the Celtic manuscripts preserved in the various schools of learning, states that he was visited on one occasion by a gentleman who had received a large sum of money for writing the History of Ireland, and when he examined the Professor's (Mr. O'Curry's) collection of ancient Irish manuscripts exclaimed, "How is it possible that I could have written so much about Ireland without knowing anything of its real history?" This also applies to a great extent to those writers who have from time to time attempted to cast a gleam of light on the breeds of cattle in the possession of the Celts before and after the Roman invasion of Britain, or before the dawn of civilisation in Ireland.

As has been shown elsewhere, the earliest inhabitants of Britain of whom anything is known for certainty were Celts—people of the same race as the early inhabitants of Gaul (France). Those living inland from the sea coast followed a pastoral life, and subsisted on milk and flesh. However this may be, calm observers and searchers after truth must admit that ages before the dawn of the Kerry revival by Mr. Dexter there existed in both Gaul and Britain cattle which were under domestication; and that long before the dawn of our civilisation—which does not reach quite 2000 years back—these cattle were the current coin of both Gaul and Britain, by which all rents, taxes, and tithes were paid to the Kings who ruled these people.

In Coates' "Natural History of Ireland" much information is gleaned from an account given of the discovery of the fossil remains of cattle deposited in ancient mounds to be seen in various parts of Ireland. The first of these is New Grange, situated in the County of Meath, on the banks of the historic Boyne, between Drogheda and Slane. This mound is said to cover two acres of ground; its elevation is about 70ft., but its original height is said to have been considerably greater. For centuries it was resorted to as a quarry. The stones of which this mound is constructed are small on top, but the base is formed of shapeless rocks supposed to weigh 10 or 12 tons each. There is no doubt of its construction by human hands, however anterior was that mound constructed. The interior was first explored in the year 1699, or upwards of two hundred years ago.

New Grange is one of the most remarkable of the antiquities of Ireland, on account of the extraordinary collection of bones discovered near the village of Dunshaughlin, of which a detailed account has been laid before the Royal Irish Academy. Dunshaughlin is situated between Dublin and Navan, and four miles eastward from the famous "Tara," where the Prophet Jeremiah is said to have secreted the "Stone of Destiny" prior to it being taken to Scotland.

THE IRISH BREEDS OF CATTLE.

The next of importance is Lagore. Lagore is a marsh, and from the color of its peat is called the "Black Bog." In this marsh there existed a circular mound, the circumference of which was upwards of 500ft. On its removal over 150 cartloads of animal remains were found, together with a vast store of rare, and many of them hitherto unknown, weapons, ornaments, and domestic implements. The circumference of this mound was formed of upright posts from 6ft. to 8ft. in height, morticed into beams of similar material (black oak) laid flat upon the marl and sand beneath the bog, and nearly 16ft. below the surface. The upright posts were held together by connecting cross beams, and fastened by large iron nails. The space enclosed was filled with bones and black moory earth raised up in some places within a foot of the surface floor of the compartments. It was also generally found that the remains of each species of animal were placed in separate divisions with but little intermixture with any other; and the antiquities were found with them without any order or regularity, but for the most part near the bottom of the mass of mysterious debris. Yet, a valuable collection for antiquarians.

The most numerous class of bones discovered were those of oxen, and of these the heads of several varieties were found in a state of great preservation. Some of these were found to be, on examination, identical with those previously found in the bogs of Westmeath, Tyrone, and Longford, which is very important to writers.

A Mr. Ball, who was recognised as a naturalist of considerable experience, says:—"The specimens of these oxen bones discovered in this mound were, although of rather diminutive size, equal as regards beauty of head and horn to any modern breed of Longhorn, Middlehorn, and the Kerry, this being easily distinguished by the peculiarities of the slug or core on which the horn is moulded, and which had remained in perfect preservation, although in most cases the circular horn had disappeared." The same authority says:—"The most remarkable feature of these oxen heads was the specimens of the Long-horned breed—a breed of cattle which had dominated the true Irish cattle for centuries in the Midland Counties, particularly Roscommon"; and adds, "In this variety there is a very remarkable perfection of the upper portion of the frontal bone between the horns, which latter, turned downwards, both forward and backward, somewhat after the more modern type of Longhorns." There were also several heads of the polled or hornless variety, termed in Ireland "mhaol," exhibiting some slight difference as to the fineness of their heads, but in general resembling the modern Gallaway breed. A great number of these heads are broken in the centre of the forehead, as if by some blunt instrument, apparently the mode adopted of slaughter.

It is only natural, and what might be expected, that the best breeds and the largest assemblage of these animals should be found (even at an early period) upon the fertile and extensive plains of Meath. Be this as it may, the whole collection offers an incontestable proof that at a remote period Ireland possessed not only several varieties of horned cattle, but also breeds analogous to those most valued in Great Britain and Ireland at the present day, and introduced into Australia during the past one hundred years.

It is difficult at the present day to assign either a precise date or purpose to this strange collection, of which nothing similar has been found in any other country, although certain small heaps of bones of somewhat the same forms have been noticed in different parts of Ireland, namely, Cork and Down. However, they are without arrangement, and in this respect cannot be compared with those of Meath. According to the best authorities these mounds must have been constructed prior to the thirteenth century, and possibly prior to the eighth century of the

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Christian era. These mounds may have been contemporary with the celebrated historic round towers for aught our best historians seem to know to the contrary. All we know is that the early Celtic Kings could rightly be termed Cattle Kings, as they possessed large herds of cattle, besides horses, sheep, pigs, and dogs, which were very much prized, and, therefore improved according to requirements.

It is generally conceded that the Longhorns or Craven breed in Lancashire in England came originally from Ireland. Mr. John Macarthur, of Camden, introduced them into New South Wales, and bred them as pure as possible for a number of years, and many of the purebreds found their way into the coastal districts, and were always recognised as good dairy cattle. There was also a yellow and white breed of cattle which, owing to the fact that it was to be found in almost every county, never received any name to distinguish it as a breed or variety of breed. But once Ireland lost the "Stone of Destiny" her people had to part with most of what they cherished in the form of cattle and stock of all descriptions.

According to Professor Low: "The native breeds of Irish cattle may be divided into those of the mountains, moors, and bogs, and those of the richer plains, with intermixed breeds, resulting from the union of different races, foreign or native. The mountain breeds approach to the character of the ancient 'White Forest breed' in a sufficiently near degree to indicate a common descent with the cattle of the mountains of Scotland and Wales and the high lands of Devon. Of the native breeds of Ireland one very peculiar and well-defined type is derived from the mountainous country of Kerry, the most westerly land in Europe, and remarkable for the humidity of its climate. The Kerry cattle of the mountains are generally black, with a white ridge along the spine, a character agreeing with the account which older writers have given of the 'Uri' of the woods of Poland. They have often also a white streak upon the belly, but they are of various colors, as black, brown, and mixed black and white, or black and brown. Their horns are fine, long, and turned upwards at the points.

"Their skins are soft and unctuous, and of a fine orange tone, which is visible about the eyes, the ears, and muzzle. Their eyes are lively and bright, and although their size is diminutive, their shape is good. These cattle are hardy, and capable of subsisting on scanty fare. Although stunted in size when brought from the bogs and barren pastures, on which they are reared, they make a wonderful advance in size, even though seven years old, when supplied with suitable food. The fat of their beef is well mixed with the muscular parts, or, in technical language, marbled; and they fatten well in the inside, a character which renders them valuable to the butcher, and distinguishes them in a remarkable degree from the Longhorned breeds of the lower country and richer pastures.

"The peculiar value of the Kerry breed is the adaptation of the females to the purpose of the domestic dairy. In milking properties the Kerry cow, taking size into account, is equal, as a rule, to any in the British Islands. It is the large quantity of milk yielded by an animal so small which renders the Kerry cow so generally valued by the cottagers and smaller tenants of Ireland. She is frequently termed the poor man's cow, and she merits the appellation by her capacity of subsisting on such fare as he has the means to supply.

"This fine little breed has been greatly neglected. Scarcely any means have been used to produce a progressive development of form by supplying proper nourishment to the breeding parents and the young, and no general care has been bestowed on preserving the purity

THE IRISH BREEDS OF CATTLE.

of the stock. In almost every part of Ireland the breed has been crossed with the Scotch Kyloe, and a great proportion of the cows of the country known under the name of Kerries are the result of crosses of this kind, and so have deviated in a greater or less degree from the native type, and almost always for the worse.

"A few honorable exceptions, however, exist to this too general neglect of the mountain dairy breed of Ire'and. One attempt has succeeded to such a degree as to form a new breed, which partially exists with the character communicated to it. It has been termed the Dexter-Kerry. It was found by the late Mr. Dexter, agent to Maude Lord Hawarden. This gentleman is said to have produced his curious breed by selection from the best of the mountain cattle of the district. He communicated to it a remarkable roundness of form and shortness of legs. The steps, however, by which this improvement was effected have not been sufficiently recorded, and some doubt may exist whether the original was a pure Kerry or some other breed proper to the central parts of Ireland now unknown, or whether some foreign blood not mixed with the native race.

"The Kerry cows afford admirable first crosses with the Ayrshire North Devons, and other larger breeds. Of these crosses, that with the Ayrshire is the most general, and appears to be the best. The crosses are found to be well adapted to fattening, as well as to the dairy, and the profit from this system is so immediate that it is to be believed that it will be more largely resorted to than a progressive improvement of the parent stock. Nevertheless, the cultivation of the pure dairy breed of the Kerry Mountains ought not to be neglected by individuals or public associations. The breed is yet the best that is reared over a large extent of country, from its adaptation to the existing state of agriculture, and to the humid mountains and bogs in which it is naturalised. Were it to be reared with care in a good district, the form would be gradually more developed, and the Kerry breed might then bear the same relation to the mountain breeds of Ireland which the Castle-Martin does to those of Wales, or the West Highland does to those of the North of Scotland."

It is a great number of years since David Low wrote this article on the Kerry breed of cattle, and no doubt from his intimate acquaintance with natural history he formed a correct estimate of the value of the breed in Ireland. Since then, however, men's attention has been more and more drawn towards the improvement of soil and the providing of more and better food for their stock. That being so, few indeed will be found to waste time manufacturing breeds out of runts when they can obtain those that only require more food and care.

But when we turn our attention to the Brittany breed of cattle, which centuries ago was one and the same breed as the Kerry, we are at once confronted with a classic breed of cattle which have been kept free from any alloy blood for centuries. The cradle of this remarkable breed of cattle is the north of France, where dwell the most Celtic of the races of France. In the people of Brittany there is nothing of the Norman. They are purely Celtic, even as Irish as the Cornish, the Welsh, and the Highland Scottish. They are people of warm hearts, quick minds, sensitive to suffering, energetic in finding the remedy, Greek in temperament rather than Roman.

It is patent to all who have studied the history of the Brittany and Kerry breeds of cattle that they are descended from the identical ancestor, having been prized for their dairy qualities more than for that of their meat-producing properties. Hence it is that they were not admired by English breeders. This breed, therefore, unlike the "Longhorns," escaped the notice of the beef-breeders of England.

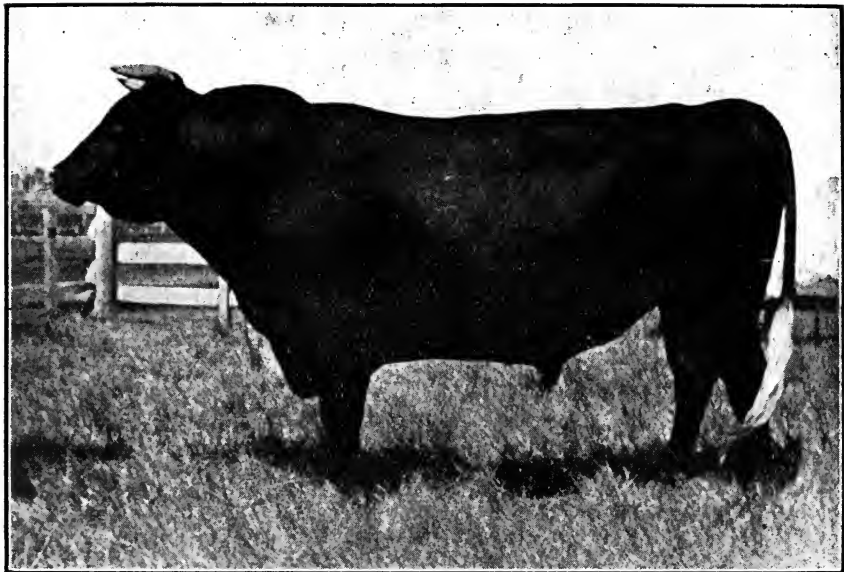
The Brittany breed may be described briefly as being black and white in color, below the average dairy animal in size, well shaped

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

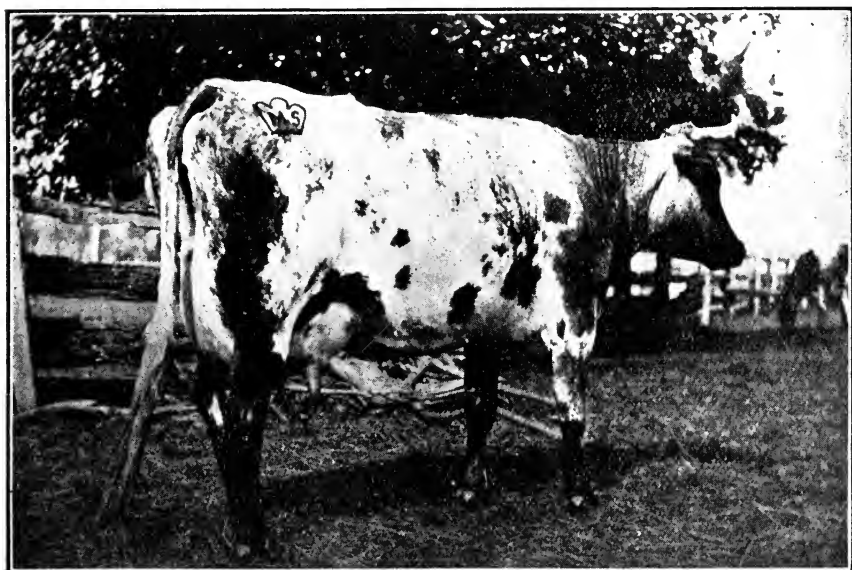
for dairy purposes, and possessing good constitutions. Like the Jersey they are, probably, more adapted to grace the lawn of a gentleman's villa than to withstand the careless usage of the average Australian herds. Like the Kerry and Alderney, they were by no means unknown to the early Australian dairymen. As far back as 1825 these animals had their admirers among the more fashionable of the Australian residents. A Mr. Ryan, who was Chief Clerk of the Records in Sydney, and a Mr. Garard, a flour-miller in Sydney, took a great interest in the Brittany breed of cattle. Both these gentlemen, however, had interests on the Clarence and Richmond Rivers, and, therefore, turned their attention to the beef breeds; and whether they sent any of the members of their little black and white breed to those Northern Rivers cannot now be ascertained.

At this stage in the progress of our history my readers may reasonably ask the question: If these breeds of dairy cattle had been cultivated to such a high standard of perfection at such an early date, why were they not preserved in the young colony? My answer is a plain one. When a semi-circle of, say, fifty miles from Government House, Sydney, embraced the chief cattle breeding centre of the colony, all the cattle in that area were bred and cared for on exactly the same lines as in the older countries. But the laws of Nature, which regulate all breeds to a common level, and when the survival of the fittest is certainly not the survival of the best dairy quality, we arrive at an age in our early progression when the tender care necessary to promote high qualities in all classes of stock was totally neglected, and the early bushman's usages survived the well-trained husbandman. In the words of Auld Cuddy, "They a' swealed awa'." Hence the passing of nearly all our early refined breeds of dairy animals—to be revived again in more classic times.

THE IRISH BREEDS OF CATTLE.



Bull, Belmore. Color : Dark Red.
Bred by Mr. William Moles, Tongarra, Albion Park.
The Property of Mr. J. W. Musgrave, Yallah, New South Wales.



Cow Fairy. Color : Roan and White.
Bred by Messrs. Musgrave Bros. Yallah, N.S.W.
The Property of Mr. J. W. Musgrave, Yallah, New South Wales.
(For further particulars see Appendix.)

CHAPTER X.

THE HEREFORD.

With the exception of brief general reference by a Mr. John Speed in his description of England, Scotland, and Wales, written in the year 1627, it is impossible to find any allusion to the original breed of cattle from which the Hereford breed of cattle sprung by English writers prior to or during the eighteenth century. This omission is explained away by the circumstance that it was not till about 1750 that British agriculture began to raise up its own chronicles, or that breeds of live stock attracted much notice. Since the advent of the agricultural writers, however, there have been millions of pages written on almost every conceivable subject relating to agriculture and stock raising.

This great inrush of literature, however, never appears to be capable of bridging over the great gulf that lies between "Speed" in 1627 and "Marshall" in 1788 with regard to the origin of the "Hereford." And as "Marshall" was contemporary with Arthur Young, who wrote the annals of agriculture, it is safe in saying that in the story nearly all the breeds of English cattle are lacking in this respect.

The writer was fortunate in becoming possessed, some years ago now, of the books that were written by Messrs. Marshall, Arthur Young, Miles, Gilpin, and a host of other writers who endeavoured to connect the history of agriculture and stock raising with the various families whose ancestors had resided for a century or more prior to the writing of their respective surveys in the different counties of England, Scotland, and Wales. There is, however, nothing to connect the history of any of the English breeds of cattle worthy of note prior to, say, 1627, which leaves a great gap between, say, the Norman invasion of 1066 and 1650.

We take the writings of Thomas A. Knight, who contributed to the Royal Agricultural Society's Journal (England) an article in the year 1790. As regards the scientific field of research he was considered one of the most distinguished men of his time. He says:—"The cattle of Herefordshire had long been distinguished for their superior quality, and he had, therefore, taken some pains to discover their origin, and the result of his inquiries led him to attribute it to the introduction from Flanders in France of a herd of cattle by Lord Scudamore, who died in 1671." Mr. Knight further adds:—"In proof of this statement, let us examine Cuypp's pictures of the cattle of Flanders, which are represented as being of the Hereford type, and of similar color with white face." Mr. Knight was an eminent scientist, and, therefore, would not be easily led away to France to seek the origin of the Hereford, if there was not sufficient reason afforded for doing so; and then, if he was not certain that there was better evidence there than nearer home.

Cecil, in his hints on agriculture, thus refers to the matter:—"The origin of the Hereford is not accurately known, though it is related that they were imported from Flanders some two centuries ago." Cecil wrote his essay in 1800.

Mr. John Lawrence, writing in 1805, says:—"A mixed breed is, in general, supposed to be the origin of the Hereford and Devonshire breeds." This, however, cannot be true regarding the Devon breed.

Mr. William Youatt, who wrote in 1835, endeavours to prove that the Hereford breed is an aboriginal race—a description which he also applied to the Welsh and Scotch breeds; whilst we learn from Professor Low, in his able work on "Domesticated Animals," that Here-

THE HEREFORD.

fordshire was of old part of the possessions of the Cambro-Britons, but at a very early period it fell under the dominion of the Anglo-Saxons. "The Herefordshire cattle," he remarks, "have that yellow-orange color of the skin which distinguishes the Pembrokes and the Devons, and those breeds, with that medium length of horn which separates such breeds and varieties from the race termed 'Long-horns.'" The breed as it then existed, he believed, "owed all its reputation to modern changes." Professor Low, of course, was referring to the "Hereford" of his day, which has been much altered since the beef boom of 1850, and such a circumstance should always be noted for the purpose of comparison.

Mr. Edward Yeld, who was himself an eminent breeder, in giving his description of the Hereford breed of cattle, says:—"The important accounts given of the breed of Hereford cattle during the eighteenth century induces me to record what is within my own knowledge, and also that derived from sources within my reach. Much of my knowledge is derived, however, from my acquaintance with a retired intelligent farmer and breeder of Herefords, being himself a successful competitor at the old Herefordshire Agricultural Society, and who possessed a dozen or more handsome prizes of his own winning during the last and present century—namely, from 1770 to 1820, which covers a period of fifty years. Going back to 1750, there were very excellent Herefords of two kinds, viz., the mottled-faced and the white-faced. By far the best breeds of mottled-faced Herefords were in the possession of Mr. Wm. Galliers, of Wigmore Grange, and that of the white-faced in the possession of Mr. Tully, of Huntington, and Messrs. Tomkins and Skyrms, Stratton. Before the close of 1799 Mr. Ben Tomkins obtained the lead, and took a very prominent part for many years. Mr. William Galliers, before mentioned, and Mr. Ben Tomkins were on terms of personal intimacy, and from the great similarity of their herds there is every probability of their being derived from the same source—namely, from the herd of Mr. William Galliers, of Wigmore Grange."

With regard to the introduction of the Hereford breed of cattle into Australia, one has only to follow the accounts given elsewhere of the early importations of stock into New South Wales to learn that Herefords were being imported from time to time by various breeders. Mr. D. C. McConnell, of Cressbrook Station, Queensland, was, therefore mistaken when he stated some years ago as follows:—"The first Herefords imported to the Southern Hemisphere were three cows and a bull introduced by the Cressy Company of Tasmania in the year 1825. The bull," says Mr. McConnell, "was called Billy, one cow Beauty, another Matchless, and the third was unnamed." He further adds: "They came from the best herds in Herefordshire, but, unfortunately, their pedigrees were lost. It is certain they were fine specimens of the breed, and upon these the Cressy Company built up the foundation of their herd; from this in their turn have sprung most of the noted herds of Australia." Without for a moment doubting the correctness of that part of Mr. McConnell's statement relating to the Cressy Company's importations, one is bound to state in the face of it all that the Cressy Company were by no means the first to import Herefords to the Southern Hemisphere.

Messrs. Hobbler, Nowlan, and George Loder, of the Hunter River, and Mr. Charles Reynolds, of the Paterson River, no doubt obtained a large number of bulls and cows from Tasmania. But their Tasmanian purchases formed but a small percentage of the number of Herefords to be found in New South Wales prior to 1825, as can be shown by reference to the records of the importation of those animals to New South Wales, mentioned in another chapter of this work

CHAPTER XI.

THE DEVON.

The Devon breed of cattle has been referred to by several writers as the oldest of all our breeds of domesticated cattle, inasmuch as the ancient Egyptians possessed most valued herds of red cattle as recorded in the "Al Koran" with regard to the orphan boy and the red heifer, but probably more particularly on account of the uniform size, and especially the color, which seems to be better defined and more permanently fixed than the color of other breeds. The question of size, although of some importance, does not appear on close investigation to be quite so important, in connection with the question of origin, as many writers suppose it to be. Take, for example, the dog; how marvellously wide are the variations in size that have been obtained from that species of animal alone. Color, too, is subject to all sorts of variations. But it would appear that the Devon breeders and fanciers have for all time held the color to be one of the most important characteristics. As with the Hereford, so with the Devon breed of cattle, many important writers seem to favour the impression, long formed, that the "Salese" breed of cattle, which have existed in France for centuries, are identical in color, size, and shape of body and horn with the North Devon. Further, there is no evidence to disprove the theory put forth by French writers, "that the early Celts carried their famous breed of cattle with them into England."

The Rev. Richard Polwhele, in his "History of Devonshire," says:—"Whether the breed of cattle famous in the North of Devon are indigenous or not it is not easy to determine. There are, however, some circumstances in the description of them which lead us to think that they are indigenous." The reverend writer has, however, unfortunately, withheld from us "the circumstances in the description of them" which caused him to arrive at the proof of the antiquity of their English origin.

Mr. James Sinclair, in his "History of the Devon Breed," says:—"On more than one occasion the breed has been on the eve of extinction through the ravages of disease. Foremost among the names of breeders who took part in the restoration of the Devon we must, in bare justice, place the name of Francis Quartly.

"The Quartly family went into North Devon from Somersetshire about 1666. In the year 1705 James Quartly, whose name appears in the baptismal register of the Parish Church of Exton in the year 1668, entered into the leasehold possession of the estate of Great Champson, in Molland, which from that year has been occupied by his descendants. The annals of the family do not show whence he obtained his live stock for the Molland Estate—whether he took that which was on the land in the hand of his immediate predecessors, bought stock in the neighbourhood, or brought animals which he had either bred or purchased in Somersetshire. Neither he nor his son Henry, who succeeded him, lived to a great age, for the death of the latter is recorded as having occurred in 1725. This Henry Quartly left a son James, who was born in 1720, and died in 1793. James Quartly had three sons—Henry, William, and Francis—great grandsons of James Quartly, who was first of the family at Molland. The names of the second James Quartly and his three sons, Henry, William, and Francis, were all as closely connected with the rise of the fame of the Devon breed that we cannot dissociate them. Yet the foremost place in the history of the Devonshire breed of cattle in England must be conceded to the name of Francis Quartly; and from Francis Quartly

THE DEVON.

to the present time there has been no break in the chain of the Devon breed of cattle."

Like the Hereford cattle, the Devons were introduced into New South Wales by various admirers of the breed since 1800 up to the present time, as shown in the records published elsewhere. Those writers who have previously taken upon themselves the task of explaining away the history of the Devon breed of cattle in Australia seem to have fallen into the same errors as the Hereford historians—that is, they simply did not previously study Australian history.

In a book published in connection with the history of the Devon breed of cattle, it is stated that: "Mr. Hobbler, of Aberglasssey, Hunter River, was the pioneer breeder of New South Wales, and it is also believed of Australia. Mr. Hobbler brought his cattle with him from Tasmania, but it is now uncertain whether he took them to that colony from England, or whether a small Devon herd had been established by someone else in New South Wales." Here the writer shows his utter lack of knowledge of the New South Wales herds that flourished prior to 1820, including those of Captains Kent, King, Sir John Jamison, Messrs. Dixon and Hannibal Macarthur.

The North Devon, like the mottled-faced Hereford, had been in former times good dairy cattle, possessing strong vigorous constitutions, with a strong frame, covered with a good coat of hair attached to a very thick though pliable skin, which suited the many varieties of our Australian climate. As will be seen by the records, Devon cattle were being constantly imported and largely bred in New South Wales long prior to the arrival of Mr. Charles Reynolds in the colony. But probably no breeder has given the breed so much study and attention as he did. Mr. Charles Reynolds, the founder of the Tocal herd, Paterson River, was manager for his father, Mr. Thomas Reynolds, of Raddon Court, Thorverton, Devon, England. This herd was sold in England in 1839, and in 1840 Mr. Charles Reynolds came out to New South Wales and commenced breeding pure Devons at Louth Park, near West Maitland. He afterwards removed to Tocal, on the Paterson River, where the herd is still kept up-to-date by his sons.

Although Messrs. Yeo, White, Mitchell, and others have made many importations of Devon animals of high quality, all have been associated more or less with the Tocal stud herd, all of whom had stud animals from Mr. Hobbler's Aberglasssey stud, on the Hunter River, who possessed a good herd of Devons prior to 1840.

In the "Annals of Agriculture," published 1801, vol. 26, it is stated:—"In the large districts of Somersetshire and Dorsetshire there are numerous dairies full of Devon cows, which yield a large supply of milk of the best quality. The breed has, indeed, when the milking qualities have been attended to and developed, been famous for milk production, but they are mostly of the North Devon type."

According to the most reliable opinions, it was by crossing these North Devon dairy cattle with Shorthorns that produced the red Lincoln breed so often referred to throughout the early history of dairying in New South Wales. Since, however, the destruction of the milking qualities of both the Shorthorn and the Devon in order to produce more beef, it is almost impossible to produce a milking herd which under the circumstances would not be at all advisable, as being by means of that cross without the introduction of Ayrshire blood, a roundabout way of getting at a practical result.

PART III .

CATTLE REFLECTIONS OF A LIFETIME.

CHAPTER I.

CHANGES IN OLD TIME CATTLE.

That the semi-aboriginal cattle of Great Britain and Ireland are intermixed with most of the breeds of domesticated cattle found there to-day almost goes without saying ; and that the wild white cattle of England, Scotland, and Wales are identical with those found in many parts of Europe ; and, also, that they are of Eastern origin.

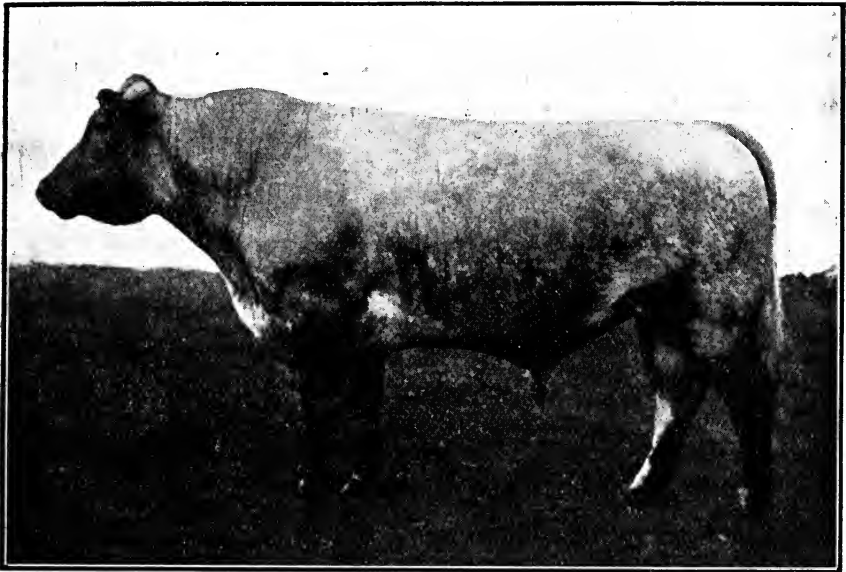
Bruce, on entering Abyssinia by the Mountain of Taranto, describes the bulls and cows as of exquisite beauty, as being completely white, with large dewlaps, with horns and hoofs completely well turned, with the horns wide, and the hair like silk, and all of one species.

Now, according to Wallace, the term species "is a collection of all the individuals which resemble each other more than they resemble anything else, which can by mutual fecundation produce fertile individuals, and which reproduce themselves by generation in such a manner that we may from analogy suppose them all to have sprung from one single individual ; or a species, in the usual acceptance of the term, is an animal which, in a state of Nature, is distinguished by certain peculiarities of form, size, color, or other circumstances from another animal. It propagates 'after its kind' individuals perfectly resembling the parent ; its peculiarities, therefore, are permanent."

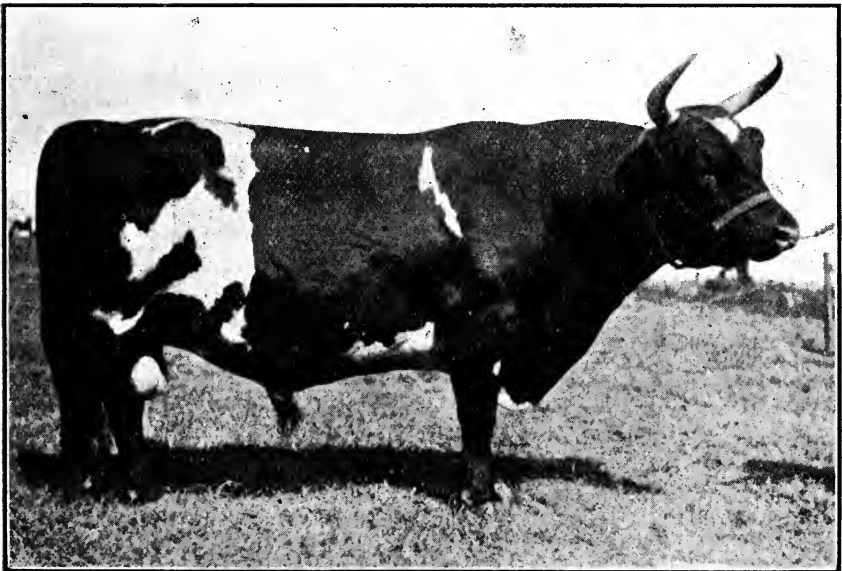
But what seems most peculiar is the fact that in a wild or aboriginal state the ox has a "hump" on his shoulders ; yet in a semi-aboriginal state, such as the wild white cattle of England, Scotland, and Wales the "hump" has disappeared, leaving but a prominent shoulder to which is attached a slight mane, which may not unreasonably lead the unscientific mind to the conclusion that there was a marked distinction between these two species instead of one being merely a variation from the other. We have evidence of the white cattle of England, and also of the semi-wild black cattle of the Highlands of Scotland, occasionally throwing black, and white calves. But with the exception of Professor David Low, we have no authentic account of the buffalo casting its "hump" when under domestication.

Professor David Low, writing of the "hump" peculiar to buffaloes, says :—"The accumulation of fatty matter on the shoulder of the ox may not unreasonably be regarded as a natural provision for fitting him for countries of intense heat. The cultivated ox of England accumulates fat largely within the body ; but this might not consist with the exercise of the animal functions in a climate of high temperature, and, therefore, the fatty secretion may be placed externally on a particular part of the body. In certain races of sheep in Africa the same tendency is observed, lumps of fatty matter appearing beneath the skin on the shoulders and head ; and in other races it appears on the tail, which becomes of an enormous magnitude. The hump of the camel seems to be a similar provision for the accumulation of nutriment matter, and may be supposed to be connected with the extraordinary patience under abstinence from food which distinguishes this child of the desert. The fatty hump of the ox of warmer countries may thus be regarded as an adaptation of the animal to the con-

CHANGES IN OLD TIME CATTLE.



Bull, Pirate King. Color : Light Roan.
The Property of Mr. Alexander Campbell, Gerringong, N.S.W.
(For further particulars see Appendix.)



Bull, Guss of Coolangatta. Color : Brown and White.
Bred by the late Sir John Hay, Coolangatta, N.S.W.
The Property of Mr. Thomas Brown, Holly Mount, Kiama, N.S.W.
(For further particulars see Appendix.)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

ditions in which it is placed. Another provision for fitting the cattle of warmer countries to the circumstances of their situation is the possession of light sinewy and active forms. The heavy cattle of the rich lands of Holland or England could not subsist in the arid climate and on the scanty herbage of the African desert. Hence we find the cattle of Africa of less bulk of body and more agile in their motion than those of the temperate countries of abundant herbage."

Art, however, has modified the defects in the appearance of these "humped" cattle by even the application of food alone, and whenever these buffaloes have been domesticated for any length of time they develop into more massive and yet more gainly looking animals. Yet it is very remarkable how tenaciously these animals seem to cling to many of their characteristics, although being crossed by English cattle for thirty years. Yet when we come to think and reflect on the subject, what are thirty years in the history of cattle?

Man, deriving his first nourishment from his mother's breast, must have been acquainted with milk; and his reason would soon guide him to apply the milk of his flocks and herds to his own material use. Hence it is that we find in books dealing with the histories of mankind the milk of goats, sheep, and kine mentioned as the chief food of the ancient shepherds and their families. The very earliest writers of Greece and Rome were familiar with the manufacture of both butter and cheese. The ancients may not have used butter as we use it, but that is a mere matter of detail, and does not affect the fact that they understood the requirements and treatment of cattle, nor does it go to show that they did not improve the breeds of cattle in their possession.

The Celts of the wilds of Britain, which the Roman arms never reached, were familiar with milk, butter, and cheese, having carried their knowledge with them from the East. They were cognisant of the fact that cattle changed materially, as they approached the hotter and dryer regions, in appearance, and produced smaller quantities of milk. They had learned these lessons from centuries of migration, and, although their knowledge is to a great extent lost to us, yet we can easily form conclusions from what is left of their early history that they possessed many breeds of cattle which they tended and preserved with jealous care.

It is unnecessary to explain what is meant by breed. According to our best authorities, "a breed is a classification by which we distinguish a group of animals possessing qualities which are not common to all animals of the same species, and which peculiarities have been so firmly established that they are uniformly transmitted by heredity." As heredity is the product of in-breeding and feeding, it will be necessary to treat each subject separately, and under its particular heading. But before doing so it may be necessary to explain that peculiar colors and markings of a race of cattle must not be supposed to indicate a species, as color, according to naturalists, is one of the external characters of animals, and is only to be regarded as indicative of specific distinctions. The habits of a wild race, in the same way, must not be supposed to constitute an impassable distinction between it and the tame animal.

Soil, climate, and environment have done much to modify the distinction which formerly existed between the various races of cattle, and besides the effects of the acquired conditions just mentioned which helped to form varieties, art and a fitting selection of the breeding parents exercise an influence scarcely less important. Experience has taught us that the character of cattle as of all animals subjected to domestication, is communicated with surprising constancy to the young, and becomes permanent by reproduction between animals of the same family. Not only are the properties of form so transmitted, but those peculiarities of temperament, the secretion of milk, and the

CHANGES IN OLD TIME CATTLE.

production of beef. It would, therefore, appear that it was by taking advantage of the almost numberless shades of divergence from the semi-aboriginal species our ancestors succeeded in evolving our numerous breeds of cattle.

A story of the old days of dairying may not be out of place here, as it will serve to join a link in the chain of dairying in Australia—say seventy years ago and to-day: "In 1835 I was a boy of 15 years," says my informant. "My father was the first man to establish dairying on the Lachlan. I helped to milk and draw the produce (cheese) in summer, butter in winter, to market. It took two days to get there, and two more to return. My mother used to salt the butter and pack it in calico bags; then it was placed in casks or brine. We used to get two and six and three shillings per lb. for it. We also made bacon and corned pork. These products would all stand carting long distances. Our dairy was constructed partly underground with a thick roof. It was wonderfully cool even in the hottest weather. We used to have two teams of bullocks, which were worked with harness like a horse with the collar turned upside down. A hundred miles or even more was easily covered in this way every two weeks or oftener. When I got a herd of my own I at once started to improve their quality. I had a pretty good herd to start with, but I wanted to make it better. In the first place, I had to find out which were the best cows in my herd (this was in the year 1848). There was no way to find this out only by measuring and setting each cow's milk separately, which I used to churn in a small vertical churn kept for the purpose. Of course the system was only approximate, but it was practical, and exact enough for my purpose. By this means I selected the best and rejected the poorest. I selected sires the progeny of imported cattle of the Ayrshire and Longhorned Durham breeds, belonging to an adjoining station. Wild cattle were plentiful in the ranges in those days, and many others likely to go wild. These we used to run into large well-fenced paddocks which had long bush-fenced wings extending for miles in some instances. It was considered good sport in those dull times, and our reward was ample if we managed to capture from fifty to one hundred young cleanskins, as they were termed. These we would hand-feed with hay for a few weeks and by constantly riding through them they would become docile enough and could be driven from paddock to paddock on foot.

"It used to puzzle me in those days," said he, "to supply the reason of domesticated cattle becoming so very wild in the comparatively short space they would be from under control. My curiosity was still more excited over an Arab stallion that escaped into the bush from an adjoining station. Here was an animal perfectly quiet to ride suddenly finding himself at liberty among a herd of wild companions. Although he was descended from ancestors that had been thoroughly domesticated, and in the service of man for thousands of years, yet within the short space of twelve months had become the most cunning in the wild tricks of his tribe. This stallion defied capture until too old to be of any service.

"But to get back to my herd of cows. I did not pay any attention as to how my old cows or their heifers looked, nor did I trouble about their breeding. So far as I can remember, there were all sorts of breeds represented in my herd—Longhorns Shorthorns, Herefords, Ayrshires, Devons, with buffalo crosses through them. All sorts of colors were represented, mostly spotted brown and white, red and white, black and white, with a large sprinkling of the brindle sides and white backs and faces. However, I did not care about colors, nor did I care whether they were like camels or buffaloes, so long as they gave plenty of good milk for a reasonable space of time. In my eyes 'handsome was that handsome did'—the color of the hair or the peculiar crook of the horn did not trouble me. I always found in the ugliest cows, provided they were good milkers, something to admire or at least something to please.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

"After I had gone on this way for a few years, constantly keeping up the quality of my young stock, which I had reared by selecting good bulls, I found my herd improving in appearance without any appreciable gain in quality. It was then that I learned that it was not the best-looking bulls that got the best dairy stock, and straight away altered my plans, and bred from nothing but tried bulls.

"I cannot forget (said he) one old cow I had in particular. She was of no definable breed, had a brindle color, drooping hindquarters, flat sides, large capacious belly very wide underneath, thin neck and jaws, with long, flat, broad thighs. Her udder was large but not fleshy and of no particular shape. This cow was never once dry for a period of seven years, when she was killed by lightning. She could produce fifteen pounds of butter per week."

CHAPTER II.

ON A NEW THEORY OF BREEDING CATTLE.

The following, which is the new theory of breeding dairy cattle, is taken from an American review on the selection of dairy stock :—
“ We get the foundation of the knowledge needed in the selection of dairy stock by noting how the dairy qualities of cattle are first developed. The work begins by exciting the udder to the unnatural activity found in high-class cows by stripping it continuously of all the milk secreted. Such stripping or milking dry is a call on Nature for more milk, which leads to a call for more blood—from which the milk is produced—thence more food to produce the needed blood. This order, persistently followed, leads to the formation on the part of Nature of an animal that eats largely, digests and assimilates well—requiring an excellent constitution—and expends additional force in elaborating the milk from the large quantity of blood produced from the abundance of food consumed during the twenty-four hours of each day, according to the size of the animal.”

We can make a condensed summary statement of these words :—
The cow eats largely, digests amply, milks abundantly. Again, we can state that the dairy cow represents a high type of a great eater, with strong digestive and great milk production. Nature will then, in wisdom, provide strong jaws for eating, a great paunch for food, great udder for milk and, what is of greater importance still, a vigorous nerve organisation to drive digestive capacity and milk secretion. With such a review of the forces brought into action in this matter of dairy development we will now describe in detail the true type of the dairy cow and note the laws governing its growth and improvement.

We will divide the description into five heads, viz.:—Indications of vitality, nerve force, digestion, milk assimilation, and incidental indications. First, vitality :This part should be very carefully guarded. Physicians state that the dread disease “ tuberculosis ” follows in the track of the cow. Low vitality tends to poor and diseased blood and from it we obtain diseased milk and death. We do not attempt to examine as a veterinary expert, but note the following indications of a strong constitution that we want :—First, let the umbilical attachment be large. This is a good indication that the mother of the calf nourished the foetus well. Second, let there be a great depth through the heart and lung region. This indication should be looked for between the forelegs and the shoulder-blades and the development behind and about 6in. lower than the spine, which should be well defined. As you stand in front of a cow the forelegs should stand well apart. The reason for such amplitude here is manifest. Third, let the junction of the spine and skull be broad. A strong attachment here is evidence of a large vertebra, which is ever present in the dairy family with a vigorous nerve development. This animal will ever scale low in bone and muscle in comparison with her beef producing sister, but must be extra strong in the nerve system. A strong nerve system is very good evidence of a good constitution in a dairy cow. Fourth, let the hair be oily or well nourished, and the skin mellow or pliable, especially over the hindquarters. These conditions, however, are hard to describe, but are readily recognised by experience. They mean good circulation and nutrition. It is very seldom indeed a practical man is deceived in the handling of a dairy animal!—yet it's not infallible.

Nerve Force.—First, the eye should be large and full with a quiet look. Secretion of milk is part of the passion of procreation. The udder is supplied with a network of nerves. The continued milk giving continually excites these many nerves to action, which, in turn,

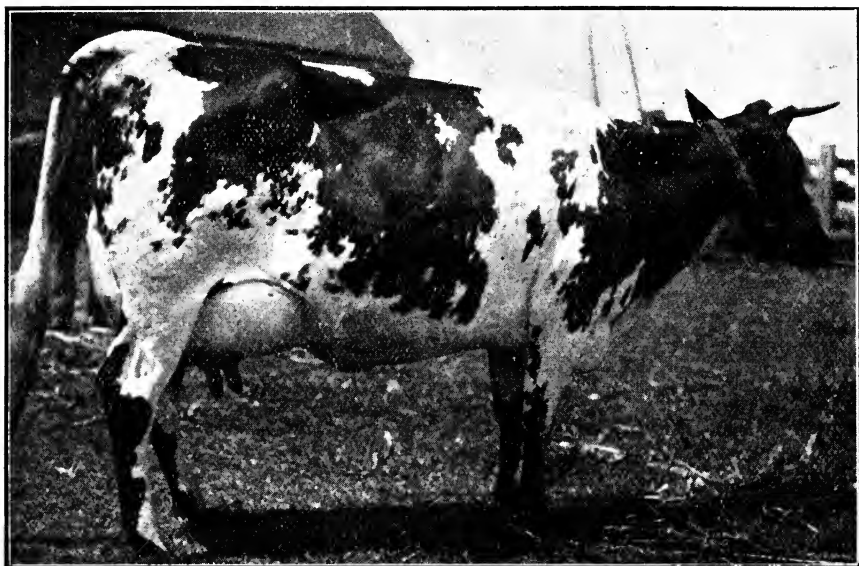
FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

excite the nerve organisation to greater activity. The brain is the power house of this system, and the full eye means great nerve power. We might call the eye the nerve gauge. Second, the backbone, which is the casing of the spinal cord, should be large for reasons given under the heading of vitality (number three). Third, the forehead should be broad and dished. The breadth indicates brain capacity, as the dishing of the frontal bone is caused by the eye socket being enlarged to meet the demands of the enlargement of the eye before referred to.

Digestion.—First, the mouth should be large, nostrils wide and open, and the lips large, giving breadth of muzzle. This breadth of muzzle is an indication of great intestinal development. Second, the spine process at the point known as the pelvic arch, and the chin should be prominent giving a fin-like appearance. This is caused by the udder and paunch, as they become weighty, pulling at the ribs, so that they hang less obliquely than in ordinary stock, and as each rib is attached to a single section of the spinal vertebrae, the change of the rib from oblique to a more perpendicular position throws each spinal process into greater prominence. Anyone taking the trouble to examine the skeletons of cattle could in time master the cause of the alteration in structure caused by great milk producing for a generation or two, especially if the animals were great eaters. Third, the spacing from rib to hip-bone, so often looked for by judges, is caused by the reasons just given; for if the ribs are brought away downward and forward to the front legs they are also brought away from the hindquarters. Further, the paunch so unusually developed by the eating capacity of the cow compels the breathing to be performed more in the fore part of the body. The ribs are largely used in inhaling air in the act of breathing. This largeness of the paunch throws these ribs at this point out of use, and as a consequence Nature eliminates or takes out the ribs in course of time. May we not say that the floating rib is one that is in the process of elimination and will be dropped? Here, then, we have another registry of Nature that the animal is a great consumer when under stress of production. Fourth, the depth from the stomach immediately in front of the udder should be considerable. This indicates that the digestive process is very closely allied with milk secretion. If this line is short the animal might eat largely, but expends its force so obtained in running and roaming about, but not in producing milk. The connection between food, blood, and milk is here strong and unbroken. This is a very important point. Anatomy and physiology will unite with experience in testifying that a poor connection here will result in a very poor type of cow.

Milk Secretion.—First, udder capacity is the first thing to be noticed. The fore udder is not easily seen by the eye, whereas the rear udder extends upward to that point between the thighs, where the skin ceases to be as ample as on other parts of the body. The hindquarters will be broad, flat, or long and wide, according to the position from which they are viewed; but generally defined as rump long and wide; thighs flat and wide; broad and flat under the vulva—with pelvic arch and tail well defined. Second, the udder should be fine-haired, as the continual flow of blood for generations in great quantities has produced animal heat in that part to the point of fining or expelling the hair. Third, the udder should have a glandular quality. This is evidence that blood is crowding the udder space, to the exclusion of more fleshy tissue. Fourth the milk veins will develop with the years of treatment of the cow, by the same law that action will develop any member; but the holes through the abdominal wall will ever be present at all ages. There should be on each side one single one, and larger at maturity, and from these, two more. The extensions of these entrances towards the front legs are in proportion to the strength of line in dairy breeding. Sometimes these entrances are

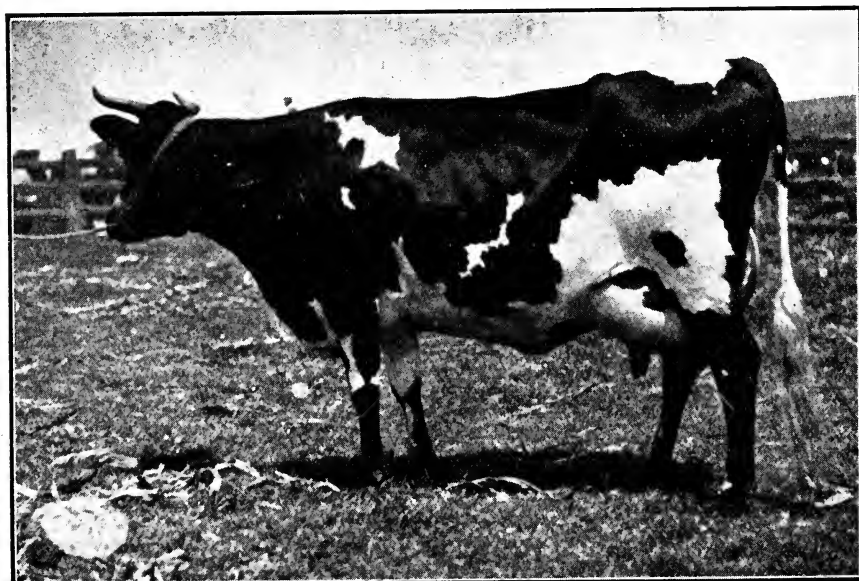
ON A NEW THEORY OF BREEDING CATTLE.



Cow, Dumplin II. Color : Light Red and White.

Bred by and the Property of Mr. George Grey, Longbrush, Kiama, N.S.W.

(For further particulars see Appendix.)



Cow, Butterfly. Color : Bright Red and White.

Bred by and the Property of Mr. George Grey, Longbrush, Kiama, N.S.W.

(For further particulars see Appendix.)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

made, in part, under the foreleg. The reason for these indications is that the large quantity of blood from the digestion and the udder returning to the heart in its circulation, requires ample entrance room. So the holes are increased in size and number, and the extension of the veins before entrance is to give more room for the veins without the abdominal walls, so as to adapt themselves to the various altitudes of the body and be free from the weight of the heavily food-burdened viscera. Fifth, the teats should be of good size and well placed. This indicates good, strong, well-developed quarters in the udder. Sixth, the space behind the shoulder-blades on the spine should have a decided pitch downward, as opposed to its being rounded, as in beef cattle, where it is referred to as the "crops." This may be called the form of poverty of the rib. All flesh-formers in quadrupeds are rounded at the point. This space so formed is the best indication that the animal will be a continuous milker—unless spoiled by bad handling—for it will not rob the udder for flesh or fat forming.

Incidental influences.—First, the horns should be fine at the base. This is largely owing to the depletion of the fore part of the body by the correspondent development of the hind part of the body. The brisket and neck should be fine, but not too fine, broad underneath. Third, the legs and tail should be fine, yet strong; and should be well placed OUTSIDE THE BODY. They are little used by cattle when well fed and cared for in small enclosures. The fineness of the professional man's hand compared to the working man's is a case in point. Fourth, as before stated the hips should be broad and the pelvic arch high. Both of these point to procreative power and udder capacity, together with ample room for the young.

Most of all these various points have been more or less understood as applied to the cow, but the fatal error has been made in not tracing the same laws in the conformation of the sire—especially in the show ring.

CHAPTER XI.

WHAT CONSTITUTES A GOOD DAIRY BULL.

The chief point of a dairy bull is a sound constitution, and having descended from cattle possessed of sound constitutions for generations, and of special dairy quality. The color of Shorthorns may be red, or red and white, roan, or roan and white, although many very excellent dairy-bred bulls have been white in color. The head should be long and strong, not coarse, but masculine. Neck fairly long, massive on top, but fine underneath. Forequarters fine and strong, not too sharp on top, so as to allow plenty of room between the forelegs. This will indicate lung power. Back straight, level, and uniform, loins and hips broad. Body capacious and of good depth behind; skin loose and pliable; ribs well sprung and running very deep behind. Flanks very deep and flat. Hindquarters long and level, broad behind, and wide between the pin bones. Thighs broad, deep, and flat, clean and fine inside. Legs not too short, bone fine and flat, joints well and neatly formed. Testicles long and even and well developed, square underneath, and hanging perpendicular. Milk veins should be clearly defined. Teats set wide apart. Escutcheon should be of the best quality. Tail well set on, fairly fine, and long.

The carriage of a dairy Durham bull, which is very important, should be active, with the head somewhat lower than the shoulders. The shoulder-blades should be free and open in their movements, if anything a little higher than the spine. There is, however, no hard and fast rules to go by in the selection of a bull for service in a dairy herd. Practical experience teaches us that many of our best sires were on the whole common enough looking animals, whereas some of our best looking animals left nothing behind them worth owning.

Take, for example, the late Mr. Evan Evans' bull "Major" and Mr. Jenkins' "Theodore" as examples. These bulls, if not bred within a few miles of each other in Dapto, Illawarra and Nepean Towers, Camden, were practically reared there. "Major" was a medium-sized bull, with fair length of body. His color was very light roan on body, and patchy dark or blue dappled roan on neck and head. His head was long and coarse; horns fairly long, thick at base, inclined downwards at the base, and upwards and inwards at the top; eyes full and placid; shoulder-blades high and heavy, legs fairly long with a round coarse bone, body lean and fairly deep; hindquarters long, with fair width. He was by no means a show bull, yet he soon proved himself to be the very best type of bull to mate with the dairy cows of that time; and it should ever be remembered that the most enduring types of this Major strain were produced from cows of the McGill strain, which in turn had been produced many years before from the best strains of Messrs. Terry-Hughes, Johnston, Lomax, and Osborne.

During many years prior to 1850 Messrs. Evans and Osborne were associated together in a station property at Paddy's Plains, in the district of Lachlan, and used to take large drafts each of young heifers from Illawarra to this station, from whence they would bring them back springers at from three to four years old. Bulls bred from Iceley's "Comet" were as a rule most favoured for dairy herd purposes on the Lachlan River stations in those times, although many admired the bulls bred from William Lee's Bimbalingai station, in the same district.

It will be seen, therefore, that fifteen years at least prior to Mr. Evan Evans becoming possessed of the services of the bull "Major" he, in conjunction with those just mentioned, was possessed of valu-

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

able strains of dairy stock, the progeny of bulls selected from the best Durham, Shorthorn, Longhorn, and Lincoln strains in England; and, further, when the bull "Major" was put into the Penrose herd at Dapto, Mr. Evan Evans had some of the finest specimens of dairy cows to be found probably in the world. So that after all, the "Major" blood was nothing more than the blend of blood that suited the dairy strains in the Illawarra district at the time—namely, from 1860 to 1868.

"Theodore," on the other hand, was a picture of symmetrical beauty—a perfect model for one of Landseer's noble works of art which we can occasionally see hanging in halls of some of our more wealthy stock raisers. Had this beautiful rich roan, with his faultless head and eye, been mated for ten years, as "Major" had been, with the best specimens of cows then in use among the dairymen of Illawarra and Shoalhaven, there is not the slightest doubt but that the best possible results would have been obtained. Mated as he was with Durham beef cows, his progeny produced very excellent milkers, and in consequence not at all admired in those days by beef Shorthorn breeders in New South Wales.

As Carr says:—"Without subscribing to the axiom that 'Beauty ever desigas to dwell, where use and aptitude are strangers,' it may be, however, safely asserted that the proportions and the disposition which best accomplish the particular purpose for which an animal was designed, are the true desirable ones." Theodore was an example.

Experienced graziers are well aware that the light and elegant neck, so much lauded by some, and indeed so desirable in breeds whose sole merit consists in their dairy properties, is usually accompanied by general lightness of flesh, and in animals in moderate condition almost invariably with rough shoulders, prominent in their points and bare of flesh.

Now, it will be admitted that angular points are inconsistent with the conditions of true beauty, which require that the parts should unite gradually and insensibly one into another without any projections. If it were possible to place a picture of the bulls "Major" and "Theodore" side by side, it would be found that each in turn were representative of the two types just described. "Major" was angular and bony, certainly not fleshy, with a thin neck. "Theodore" made up by condition was fleshy; the neck increased, though not abruptly in size, until it melted insensibly into the shoulders, which again blended imperceptibly with the crop, fore flank, and ribs, without any depressions.

Following closely these two remarkable bulls by means of comparison a little further, we find that whereas "Major's" pedigree was never published, "Theodore" had an excellent pedigree, his number being (292) in the New South Wales Shorthorn Herd Book, and going straight back to "Bolingbroke" (86). "Major," on the other hand, was reported to have been purchased as a calf at Burt's Bazaar, Sydney, having been born at sea; and that his dam was imported by Mr. Lee, of Bathurst. The writer went to no end of trouble to ascertain the correctness of that report, but failed to get any information that would show that "Major" had ever been on a ship beyond the one that brought him from Sydney to Wollongong. There are three letters, one each from the brothers Lee—namely, Mr. George Lee, M.L.C., Leeholme, Bathurst, Mr. John Lee, Kelso, Bathurst; and Mr. James Lee, Larras Lake, Molong, which can be examined by anyone desiring to do so. But not content with these letters—having in the meantime discovered that the Messrs. Lee had imported a cow and calf about the period "Major" was brought into Illawarra—another letter was despatched to Mr. James Lee on the subject. The following is a copy of his reply:—

"Larras Lake, Molong, March 12th, 1894. Mr. Frank McCaffrey.
Dear Sir,—I am in receipt of your letter of 9th instant. My

WHAT CONSTITUTES A GOOD DAIRY BULL.

father imported the cow you speak of, and she had a calf which was not sold, but brought from Sydney to Bathurst in a crate on a cart, the cow following.—Yours faithfully, James Lee.”

“Major,” however, in the face of the fact that he had no pedigree, was mated with some of the best dairy cows that ever looked through a bail, and the result was that his progeny were second to nothing in the world as milk and butter producers, while “Theodore’s” stock, with all their fashionable ancestry, drifted away among the beef Shorthorn breeders and were lost to the dairymen of Illawarra, who might otherwise have turned them to dairy use.

Reverting again to the Illawarra breeders of the forties and early fifties—those years when high prices made wheat, maize, and potatoes the staple products of the small settlers, and when butter was often 2s. 6d. and 3s. per lb.—Messrs Terry-Hughes, Johnston, C-sborne, Lomax, Brown, Evans, and Captain Addison were in possession of the finest specimens of the Shorthorn, Longhorn, and Lincoln tribes; and the smaller settlers were possessed of mixtures of the then known breeds and their various crosses, which were all good milkers and good doers. The British emigrants who had come to settle on these rich coastal lands were as a rule good judges of dairy cattle, many having gained their experience at the cattle fairs in their native countries, where they had learned the importance of keeping good bulls in their herds, no matter for what purpose their produce was intended—whether meat, butter, or milk.

The two first to establish high-class Ayrshire herds on the coast were the Messrs. Berry, at Shoalhaven, and a Mr. John Wylie, of Dunlop Vale, near Wollongong. Messrs. Berry afterwards purchased the greater portion of Mr. John Wylie’s herd. At either of these places young Ayrshire bulls and heifers could be obtained by the settlers, and many availed themselves of this great boon. Wylie lived on the Dunlop Vale Estate, part of which was sold to a Mr. Irvine, a son-in-law of Mr. William Howe, of the celebrated Glenlee Estate. Mr. Irvine called his part of the estate Newton, and afterwards used Glenlee bulls, which were a mixture of Durham, Shorthorn, Devon, Ayrshire, and Alderney. The Messrs. Berry imported, as is mentioned elsewhere, large numbers of the Freisian or magpie cattle; but after the death of Mr. John Berry in 1849, who had sole control of the cattle, no great interest was taken in keeping that valuable collection of the several breeds of dairy stock pure. After that gentleman’s death things in the cattle breeding line drifted. The Messrs. Berry kept their dairy cattle in what were termed mobs, with an old man named Paddy the Rider in charge. The more practical of the settlers had their fancies in stock, of course, in fact, had their fancies and fads in stock raising then as now.

But as a rule the majority did not trouble much about breeds, varieties, or even sub-varieties. So long as there was plenty of milk in a cow’s udder morning and evening she was forgiven for what was termed “the minor faults,” such as color of hair and the desired crook of her horn, and allowed a prominent place in the best paddock. The dairymen of those days believed that they could establish any breed they liked, whether it was Shorthorn, Longhorn, Lincoln, or Ayrshire, provided they could get a sufficiency of good bulls of the breed they wished to establish from the larger and more careful breeders. Their idea was to get pure bred bulls from the breeders mentioned, and place them among their heavy milkers composed as some of them were of blacks, browns, brindles, blues, and pallies, and after the fourth cross with careful culling they would have to all appearances, as the case might be, either a Longhorn, Shorthorn, Lincoln, or Ayrshire, not only in general appearance but in type and color.

The smaller settlers had every opportunity of getting good bulls, as all the breeders mentioned had not only imported bulls and cows of

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

these breeds in Illawarra and Shoalhaven, but they were interested in stations jointly and severally in the Lachlan and Monaro districts, where they could and did avail themselves of the best blood that England could produce at that period. They were in close touch with such breeders as Messrs. Throsby, Shipley, and Badgery, of Bong Bong; Messrs. Royd, Hassall, and Roberts, of Braidwood; and Messrs. Lee, Mackenzie, and Icely, of the Lachlan River districts. Mr. Icely's "Comet" gave good account of himself, as did his near relative "Ella," imported by Mr. Alexander Berry, of Shoalhaven. The strains of these bulls were held in great favour among the dairymen for many years. These breeders were mostly Longhorn-Durham fanciers.

If we are to suggest an opinion as to the cause of the many failures experienced by dairy cattle breeders throughout New South Wales, it is the want of a defined system by which success could be achieved by persevering along well-defined lines for a given number of years, and by neglecting to utilise the great advantages of soils and variety of climates so adjacent to many of our breeding centres. The soil, through neglect, soon began to give out, and the heavier breeds of cattle quickly began to show signs of distress. A cry was at once raised against the larger breeds, and smaller breeds were either substituted wholly in their places or they were soon crossed out—on the then not understood cry of "too much in-and-in breeding"—by using bulls of a different type and breed. On in-and-in breeding an important writer says:—"If there be any error in breeding in-and-in, as it is called, from good animals—and I confess I think there is—it can only be in carrying the practice to an extreme, or continuing to breed from the closest affinities. The laws of Nature have limits which cannot be passed with impunity; what is good in certain quantity is not necessarily so in double that quantity. What is good in moderation is invariably bad in excess. The practice of breeding from animals related in blood has, in the hands of practical breeders, produced the happiest results, but in less judicious hands might be carried too far."

We know that gregarious animals in a state of Nature roam in flocks, to which they are very jealous of admitting strangers, so that the animals of each flock must be very much related in blood, such as were the wild white cattle of Chillingham Park, England, and as such were the wild cattle of the Cowpastures in New South Wales; yet these cattle were remarkable for their vitality and vigorous constitutions. In reviewing the circumstances which brought about the early developments of our dairy herds, it must not be forgotten that all cattle of whatever breed were not admired if they were too white about the nose, as they were considered delicate; on the other hand, cattle with snow white hair, provided their skin was yellow and their nose and inside the ears was dark-colored, were considered valuable for dairy purposes.

Messrs. Throsby, Badgery, Osborne, Berry Bros., and Captain Addison had white bulls of the description mentioned, and for a time their progeny commanded good prices among the dairymen of Illawarra, and many now living can remember the progeny of one or other of these white bulls.

Speaking, however, of dairying as a system and the raising of stock for dairy purposes only, it would be difficult indeed to state that any man in those days bred or raised dairy herds on any defined lines. It is even questionable whether any of the early breeders had any preconceived ideas on the subject. The only man from whom we ever got any notions which could be construed into a mode of procedure was Mr. James McGill, whose father had been using Longhorn, Lincoln and Durham bulls from Messrs Terry-Hughes, Johnston, Osborne, and Lomax in the forties and fifties. He brightened these colors by using Lomax's Lincoln Reds, and then, as he said himself,

WHAT CONSTITUTES A GOOD DAIRY BULL.

"I smuggled in the Ayrshire to give vitality." This, however, as everyone knows, cannot be considered a system of breeding such as we have on record from the experience and keen observation of Bruce Lowe as regards racehorses, and Messrs. Collings and Booth among their Shorthorn herds in England. However, those of us who knew the late Mr. McGill intimately, must at once admit that he could soar unconsciously—as he was a modest man—over the heads of his contemporaries when suddenly called upon to describe his theories of either horse or cattle breeding.

Many have tried Mr. McGill's theory, but none have been able to achieve what he did with the material at their command. We must, therefore, conclude that since Messrs. McGill and Evans, and many other breeders' day the herds and pastures have deteriorated to that extent that it is now impossible to build up dairy herds such as existed in the forties, fifties, and early sixties in the dairying districts of New South Wales, or that from the sheer want of a proper system of raising dairy herds our stock raisers have not been able to keep pace with the ever-changing times.

It would appear from all that we can glean from the past that our fathers depended largely on the station owners (who were also in most cases dairymen, principally for the purpose of raising and taming the progeny of their vast herds) for their supply of bulls and heifers, the station men in turn taking the progeny of the farmers' herds, after being weaned, away to their stations. As time went on this system gradually gave out, and station owners went in exclusively for beef cattle of whatever breed they most fancied.

The dairy farmers, therefore, left to their own resources, had to depend largely on local supplies for both bulls and heifers, assisted to a large extent by dealers and city merchants, who were ever ready to send drafts of cattle to the coastal markets for sale as a speculation, and a large trade was carried on in this way up to the present time. The better and more satisfactory results, however, were obtained from those landowners in Illawarra who bought up the young stock of the district and sent them to their stations to the west and southern tableland and brought them back again as springers for sale among the dairy farmers. This change of climate had a most desirable effect on the young stock bred in Illawarra. The rich lands were used for the larger breeds and the poorer lands for smaller breeds. This, also, cannot be considered a system of breeding. It will, therefore, be necessary to explain what scientific breeders have to say with regard to system of breeding:—

Bruce Lowe, in his work on "Breeding Racehorses by the Figure System," says:—"The question, 'Why is one horse so superior to his racing contemporaries?' intrudes itself with the advent of every unusually good performer. That there is a large accumulation of vital force in the veins of one animal as compared with another is evidenced at every race meeting. This superiority of racing power does not necessarily lie in his more perfect symmetry or better condition, because we frequently see the inferior-looking and smaller horse vanquish his bigger, better-looking, and equally conditioned opponents. It undoubtedly consists of a greater concentration of vitality or nervous force in the animal. As with the breeds of horses, so with cattle. A close study of the pedigrees of great racehorses should always reveal excellent reasons why they are so, and where that vitality came from. The main difficulty for students has been to decide amid such a variety of strains which are the most potent. Some writers build their theories upon the amount of Eclipse blood in the pedigree, others incline to Herod or Matchem. One will tell you that the mare furnishes all the racing qualities, and another says, 'Given a good sire, I will breed racehorses out of all sorts and conditions of mares.' There is much truth in all these statements, but they are only theories

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES

after all, and very few are based upon more than a few selected cases to prove certain contentions, while as many examples might be cited to prove the contrary. To be of real value a theory must be based upon the bedrock of results—unmistakable and undeniable, such as the fact that the Eclipse line is the dominant one of the three great male lines. This, indeed, is about the only proved theory on horse breeding. The truth is so apparent that we need not hazard a doubt to the contrary. It is, in fact, no longer a theory, for it has been reduced to a simple statistical results of the three great English classic events—namely, Derby, Oaks, and Leger, since their inauguration in 1776, 1779, and 1780, and consequently it is based upon the sound principle of judgment by results."

That Messrs. Collings had in their minds' eye a theory of concentrating high degrees of quality into their Shorthorns by a system of saturation no one can doubt, for according to the Rev. John Storer, "Few people have any idea of the amazing extent to which in-and-in breeding was carried on by the brothers Colling, and so great was the complication it involved that few of those who know the outline of the circumstances can adequately realise all their intricacies. It is almost impossible to describe even proximately in some of its stronger features the system they pursued. But the attempt ought to be made, for the Messrs. Collings' system of in-and-in breeding is not only one of the most remarkable and authentic cases in the history of the reproduction of animals with which we are acquainted, but the early Booth bulls were amongst those most strongly subjected to its influence." Mr. C. Collings' bull "Bolingbroke," and his cow "Phoenix"—as is shown elsewhere—were brother and sister on the sire's side, and nearly so on the dam's. They were of the same family, and the only difference in descent was that Bolingbroke was a grandson of Dalton Duke, while Phoenix was not. But this apparent difference, slight as it is, was not all, real, for Dalton Duke also contained some portions of their common blood. Arithmetically stated, the blood of the two being taken and divided into thirty-two parts, twenty-nine of those parts were of blood common to both, rather differently proportioned between them. Phoenix had sixteen of those parts, Bolingbroke thirteen, the latter having also three fresh parts derived from Dalton Duke, which made up the thirty-two. Being thus very nearly brother and sister, they were the joint parents of the bull Favourite. That bull was next put to his own mother Phoenix, so nearly related to him on his sire's side also; and the produce was Young Phoenix. To this heifer Favourite was once more put, she being at once his daughter and more than own sister, too. For their two sires, Bolingbroke and Favourite, were not only as consanguineous with each other but also with the cow Phoenix, to which they were both put. The result was "Comet." Nor was this all. The system was carried much further. The celebrated Booth bull "Albion" was not only a son of the in-and-in Favourite-bred Comet, but his dam was a granddaughter of Favourite on both sides, and descended besides from both the sire and dam of Favourite.

Albion has been called "The Alloy Bull," we think with very little reason, when it is remembered that he is the seventh in descent from that blood, and that therefore only one part of his blood came from the "Alloy," against 127 parts which were not derived from it. Hence the "alloy" was of little or no importance.

Now, according to Carr: "Mr. Thomas Booth obtained his rudimentary stock from some of the best specimens of the Teeswater Longhorned Durhams. He appears to have proceeded on the principle that whilst the general similitude and mingled qualities of both parents descend to the offspring, the external conformation—subject, of course, to some modification by the other parent—is mainly imparted by the male, and the vital and nutritive organs by the female.

WHAT CONSTITUTES A GOOD DAIRY BULL.

Acting on this hypothesis, he was careful to select such well-framed cows only as evinced, by an ample capacity of chest, a robust constitution and a predisposition to fatten, and such moderate-sized males as possessed in the highest degree then attainable the particular external points and proportions be deemed desirable to impress upon his herd.

A dairy farmer under Lord Harewood, a Mr. Broader, of Fairholme, in the parish of Ainderby, appears to have possessed some cows having the qualifications required. Tradition speaks of them as unusually fine cattle for that period; good dairy cows, and great grazers when dry; somewhat incompact in frame, and steerish in appearance, but of very robust constitution. Previously to the year 1790 Mr. Thomas Booth had bought some cows from these cows. "Strawberry Fairholme," "Hazel" (i.e., flecked roan), and "Twenty Shilling Fairholme," purchased from Mr. Broader's farm, have the honor of being the ancestresses of several illustrious families of Shorthorns, and it does not require an inventive genius to frame an origin for the "flecked" and "dollar spots" so often found in members of the purest Shorthorn families in Australia, when one comes to look back to the "Hazel" (i.e., flecked roan) just mentioned, which undoubtedly showed her Longhorned-Durham origin, or, undoubtedly, a Longhorn taint in her blood.

Besides these Fairholme tribes, there was the Halnaby or strawberry tribe, which also dates from this period. The first of them was that strawberry red and white line, which, though out of favour at the present day, was then the prevailing color of the Shorthorn. She was bought in the Darlington market, and one of the earliest recollections of Mr. R. Booth was of that cow coming home. The type of old Halnaby, of 1792, who is said to have been a very finely made cow, has often been reproduced in her descendants in the herd.

Mr. Thomas Booth considered this as one of the finest families, quite equal to the Blossom and the Ariadne tribes. Young Albion (15) is the first bull of note in the Halnaby family. He was much used in the herd, and was one of the first that was let out on hire.

At that period there were, happily, no shows to demand the sacrifice of the best cattle in the kingdom, or the few that were held could be reached by the majority of cattle attending them only by such long journeys on foot as would be impracticable by animals in such a state of obesity as is now an indispensable condition in order to catch the eye of our so-called judges. High feeding at that time meant no more than good pasture for cows early dried off their milk; and the term "training" was never heard except in relation to horses. The first breeder who introduced the system, which has since run into ruinous excess of house feeding cows and heifers in summer on artificial food, was Mr. Crofton; and in that year he, of course, took all before him in the show yards. The general treatment of the females of a herd at that day was a simple hay diet during the winter months. They were put early to breeding, and generally calved at two years old. A few were taken from the lot to milk. The remainder suckled their calves until winter. They were then taken up, dried, and fed off by the time they were three years old; the same course was pursued, in their turn, with their progeny, until high prices of meat food induced forcing. After reading the opinions of such men as we have just quoted few, probably, will be found who would dare to consider the notions of breeding so universal in our dairying centres worthy of a place in the list of systems just mentioned by Messrs. Bruce Lowe, Carr, and the Rev. John Storer.

From the foregoing remarks it will be seen that whilst some of our early coastal dairymen actually followed a fairly well-defined system of raising dairy cattle, the great majority did nothing beyond the mating of the best animals they could obtain, and then allowing the soil and climate (unsurpassed as it is in any part of New South Wales for the raising of dairy cattle) to do the remainder.

CHAPTER III.

REFLECTIONS ON HEREDITY.

There is a well-known aphorism—at least it is often quoted—namely, “a man cannot write much on a scientific subject without stating something which others will not believe.” However, if we take the researches of many of our bush bred men, who never write on any scientific subject, and who will not discuss scientific subjects with anyone outside their own sphere of life, and yet whose observations are most valuable to stock breeders on account of their high utility, we find that they disregard largely the opinion of others in their ambition to arrive at cause and effect.

For instance, take the question of how the marsupials produce their young. If Professor Haeckel, caustic though he may be, were to travel in disguise as a bushman, and use only the language of the bush, he would find some very knotty problems to solve before many weeks had passed. Take, for example, the wonga wonga pigeon, which is said to only produce one or two young each season. When two young ones are found in a nest they are either both male or female, but never male and female. That this fact has something to do with the law of heredity almost goes without saying, as there is a greater affinity of blood between brother and sister than between mother and son or sire and daughter. Hence, in the wonga wonga pigeon we have a natural check against in-and-in breeding to a great extent, apart from migration.

The laws of Nature generally have within themselves no power to prevent variation. We have, therefore, a great increase in the variety of animals and plants. But the reason why Nature should step in, as in the case of the wonga wonga pigeon, and check in-breeding is a problem not yet solved. It is, however, instructive as an object lesson, and has led to much argument and practical experiment.

Kant said:—“It is absurd for a man to conceive the idea that even some day a Newton will arrive who can explain the origin of a single blade of grass by natural laws which are uncontrolled by design.”

The question is often asked: “What are the general conditions that govern the hereditary characteristic of our dairy cattle?” They may be the same, theoretically speaking, as those that govern all animal life. That passage in the Decalogue which declares that the iniquities of the parents are visited upon the children unto the third and fourth generation must always be taken into consideration when any question bearing on heredity is being reviewed. Yet science has done much to rob that statement of much of its startling significance by guiding stock raisers how to mate stud animals with a view of counteracting hereditary taints. Then again, soil, climate, and environment are most potent factors in the elimination of many apparently injurious tendencies in the bovine race.

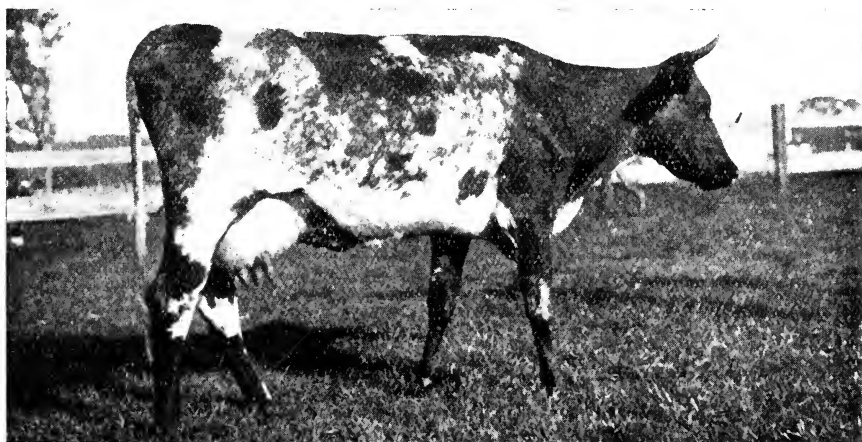
Science, soil, climate, and environment, however, are of no avail if not placed at the disposal of a practical man. Even then they are not such powerless agents as to act as wax in his hands. He will experience many disappointments. His most cherished experiments will often be eclipsed by some unknown cause—the result of some unaccountable, unseen influence of variation.

Bruce Lowe endeavoured to bring horse breeding within the range of mathematical science when he worked out what is known as the

REFLECTIONS ON HEREDITY.



Cow, Gentle. Color: Roan and White. 2 Year Old.



Cow, Favourite. Color: Roan and White. 3 Years Old.



Cow, Butterfly. Color: Roan and White. 3 Years Old.
Bred by and the Property of Mr. E. J. Marks, Terragong, Jamberoo, N.S.W.,
(For further particulars see Appendix.)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

"figure system" of breeding racehorses. That something of the kind could be worked out with regard to dairy cattle goes without saying when we reflect on the strains that mated best in days gone by and in our own time when the Evans and McGill strains were mated. We must at the same time keep in view the fact as stated by a qualified breeder with the figure system, of the difficulty of contending against reversion. Saunders says:—"This tendency to reversion in different breeds of domestic animals when crossed accounts for many of the disappointments which breeders experience in their efforts to improve their stock, and serves greatly to complicate the breeding problem."

But we are not advocating the figure system with the object of mating animals of different breeds (although it is difficult to define breed in animals bred for the same identical purpose). We are endeavouring to explain the possibility of arriving at a means by which animals of the same breed; increased in size and improved in appearance by being reared in temperate regions, on grassy plains, giving them increased size and strength as compared to their relations reared in a bleak, cold climate on scanty food of poor quality, producing a dwarf frame and scraggy appearance can, with a fair degree of certainty, be mated with extremely beneficial results.

Professor Low says:—"The effect of heat is everywhere observed, as it modifies the secretions which give colors to the skin, and the degree of covering provided for the protection of the body, whether wool or hair." Notwithstanding immense resources at the command of Professor Low from which to draw deductions, it is difficult to reconcile oneself to the correctness of his conclusions with those of historians who state that both black and white cattle were found in their aboriginal state in Scotland, and red cattle and white abounded in Egypt for centuries before the Christian era.

On the subject of heredity Alfred Russel Wallace says:—"The problem is thus stated by Weismann: 'How is it that in the case of all the higher animals and plants a single cell is able to separate itself from amongst the millions of most various kinds of which an organism is composed, and by division and complicated differentiation to reconstruct a new individual with marvellous likeness, unchanged in many cases even throughout whole geological periods?' Darwin attempted to solve the problem by his theory of 'Pangenesis,' which supposed that every individual cell in the body give off gemmules or germs capable of reproducing themselves, and that portions of these germs of each of the almost infinite number of cells permeate the whole body and become collected in the generative cells, and are thus able to reproduce the whole organism. This theory is felt to be so ponderously complex and difficult that it has met with no general acceptance among physiologists.

"The fact that the germ cells do reproduce with wonderful accuracy not only the general characters of the species, but many of the individual characteristics of the parents or more remote ancestors, and that this process is continued from generation to generation, can be accounted for, Weismann thinks, only on two suppositions which are physiologically possible. Either the substance of the parent germ cell, after passing through a cycle of changes required for the construction of a new individual, possesses the capability of producing anew germ cells identical with those from which that individual was developed, or the new germ cells arise, as far as their essentials and characteristic substance is concerned, not at all out of the body of the individual, but direct from the parent germ cell. This latter view Weismann holds to be the correct one, and, on this theory, heredity

REFLECTIONS ON HEREDITY.

depends on the fact that a substance of special molecular composition passes over from one generation to another.

"This is the 'germ-plasm,' the power of which to develop itself into a perfect organism depends on the extraordinary complication of its minutest structure. At every new birth a portion of the specific germ-plasm, which the parent egg-cell contains, is not used up in producing the offspring, but is reserved unchanged to produce the germ cells of the following generation. Thus the germ cells—so far as regards their essential part, the germ-plasm—are not a product of the body itself, but are related to one another in the same way as are a series of generations of unicellular organisms derived from one another by a continuous course of simple division. Thus the question of heredity is reduced to one of growth. A minute portion of the very same germ-plasm from which, first the germ cell, and then the whole organism of the parent, were developed, becomes the starting point of the growth of the child or the calf or other animals.

"But if this were all, the offspring would reproduce the parent exactly, in every detail of form and structure; and here we see the importance of sex, for each new germ grows out of the united germ-plasm of two parents, whence arises a mingling of their characters in the offspring. This occurs in each generation, hence every individual is a complex result reproducing in ever-varying degrees the diverse characteristics of his two parents, four grandparents, and other more remote ancestors; and that ever-present individual variation arises which furnishes the material for natural selection to act upon. Diversity of sex becomes, therefore, of primary importance as the cause of variation. Where a sexual generation prevails the characteristics of the individual alone are reproduced, and there are thus no means of effecting the change of form or structure required by changed conditions of existence. Under such changed conditions a complex organism, if only sexually propagated, would become extinct. But when a complex organism is sexually propagated there is an ever-present cause of change which, though slight in any one generation, is cumulative, and under the influence of selection is sufficient to keep up the harmony between the organism and its slowly changing environment.

"Growth," says Letourneau, "is only an excess of nutrition, and generation is only an excess of growth. Growth and generation have for cause a superabundance of nutritive materials. The superabundance has for effect first of all to carry the anatomical elements to their maximum volume, then to provoke the formation of new elements. As long as the animal has not attained all the development compatible with the plan of its being, the elements, newly born, remain aggregated to the pre-existent elements. When the limit of growth is attained, when there is no longer room in the organised animal for a new adjunction of histological elements, the newcomers detach themselves from their organic stem and constitute independent individuals which evolve in their turn. Generation is so much a continuous growth that its processes are identical with or analogous to those of growth."

By variation is understood the difference between animals not only of the same family but of the same species. Everyone knows that in each litter of puppies no two are alike; no two human beings are alike; no two atoms are alike; which goes to show that there is a higher power than Nature itself. As Wallace says:—"This individual variability exists among all creatures whatever, which we can closely observe, even when two parents are very much alike and have been matched in order to preserve some special breed." The same thing occurs in the vegetable kingdom. All plants raised from seed differ from each other. Another very common error is that variation is the

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

exception, and rather a rare exception, and that it occurs only in one direction at a time—that is, that only one or two of the numerous possible modes of variation occur at the same time. The experience of breeders and cultivators, however, proves that variation is the rule instead of the exception, and that it occurs more or less in almost every direction. “Heredity and artificial selection,” to use the words of an eminent writer, “are tangled tales.”

CHAPTER IV.

REMINISCENCES OF ILLAWARRA.

Able pens have failed to convey to the human mind the beauties of Illawarra and the Shoalhaven Valleys as presented to the eyes of the visitors and settlers alike during the thirties and early forties. As has been stated elsewhere, Mr. Alexander Berry commenced operations in the Shoalhaven Valley about 1820, where he established quite a settlement of his own, which he and his partner, Mr. Wolstonecroft, soon increased into a freehold comprising something like 80,000 acres, which was afterwards added to very considerably.

About 1822 Mr. David Smith was piloted to Kiama in quest of cedar by an old skipper named Stewart in a twenty-five ton craft, and Mr. Smith soon began trading between Sydney and Kiama, which caused a small settlement to spring up. Mr. Smith was followed to Kiama by Messrs. Michael Hindmarsh and Thomas Campbell, who took up Alne Bank and Omega estates respectively. Mr. Hindmarsh also commenced cedar getting, and a little later on went in for maize and tobacco growing and pig raising, for which his property was most suitable.

In 1829 Messrs. Henry Osborne, George Brown, William Browne, David Johnston, D'Arcy Wentworth, John Terry-Hughes, Mrs. Jemima Jenkins, John Willie, Andrew Allan, and others were either permanently settled or rapidly preparing for such on those lands lying north of Mount Foster on the south and on towards Bulli on the north, including Messrs. Smith, Hindmarsh, and Campbell.

About 1830 Messrs. John Ritchie and William Ritchie (or Wright) commenced cattle raising at Jamberoo. These, with the exception of a few smaller settlers and timber getters, comprised the whole of the settlement lying between Berry's Shoalhaven estate on the south, Samuel Terry and D'Arcy Wentworth's estate on the north, and between the coast range on the west and the Pacific Ocean on the east.

Mr. Samuel Terry's residence was then on the west side of Pitt-street, where now is Martin Place. Alongside his cottage Mr. Terry grew cabbages for amusement.

In 1835 Captain Collins had been commissioned by Captain Hart, with a capital of £80,000, to select a locality and commence a brewing and milling business in New South Wales. It had been reported that Mr. Samuel Terry had accumulated by means of a brewery something like £500,000; and that Mr. James Squires, by growing hops and running a brewery, had also acquired enormous wealth. This probably led Captain Hart to send his capital in charge of Captain Collins to establish the business in New South Wales. Captain Collins had been through the settled districts of the colony during 1833-34, purchasing horses for India, and had, therefore, an opportunity of seeing the most favoured spots. So he chose Jamberoo, and after naming his brewery, the "Woodstock," he engaged several families of the name of Vidler in the early forties, who had been hop-growing in the County Kent, England, and commenced hop growing operations at Jamberoo. He also had a flour mill and a sawmill erected, and for a few years the whole neighbourhood was in a state of boom. This venture, however was not crowned with success, and after it passed from the control of one manager to another Captain Hart arrived on the scene from England a ruined man. Yet, by his capital, he had done wonders in a very short period of time to boom Illawarra.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Agriculture commenced in Illawarra and the Shoalhaven Valleys with the arrival of the cedar getters in the twenties, when the woodman's axe laid low the giant cedars that abounded in every fertile nook and valley; yea! in many instances on the hilltops. A Government farm was established on the cleared ground near the Five Islands, Wollongong, for some years, and formed, as it were, the base of settlement, with Messrs. Emmett 1st Dalrymple 2nd, as managers.

In entering upon the occupation of the wild bush, and the uncultivated lands of Illawarra and the Shoalhaven Valleys, the first operation to be performed was to clear it of the timber and the brushwood with which it was, generally speaking, lightly clothed, according to the situation. The early settlers in these districts found the country one vast and apparently interminable woodland, with a few treeless exceptions. The dense forests were confined to the hills, and the thick jungles and cedar clumps were, as a rule, confined to the banks of the numerous streams, creeks, and rivers, and the slopes surrounding the scores of ravines that lay towards the face of the mountain ranges. This is still the character of a few of the reserved gullies.

As the quickest mode of clearing the land, and of obtaining a return from it, the undergrowth was brushed, and the trees cut down about a yard from the ground, and the timber not required for commercial purposes burnt on the spot. The stumps were thus left standing, dead and naked, to encumber the soil with their roots. This plan of clearing was largely persevered in where the settlers had to find their own labor and capital.

Agricultural operations were long conducted in the roughest style and with the rudest instruments, such as the hoe and reaping hook. On this half cleared land ploughing was a difficult process, owing to stumps, stones, and roots. Wooden ploughs answered the best, drawn by a team of bullocks. Threshing was done by flails, and the maize was shelled by hand. The land was enclosed by log fences for years before post and rail fencing came into use. These enclosures had not that ornamental appearance that our British visitors had been accustomed to see in Great Britain or Ireland; but nevertheless there were good neighbours on either side of those crude brush fences in those days.

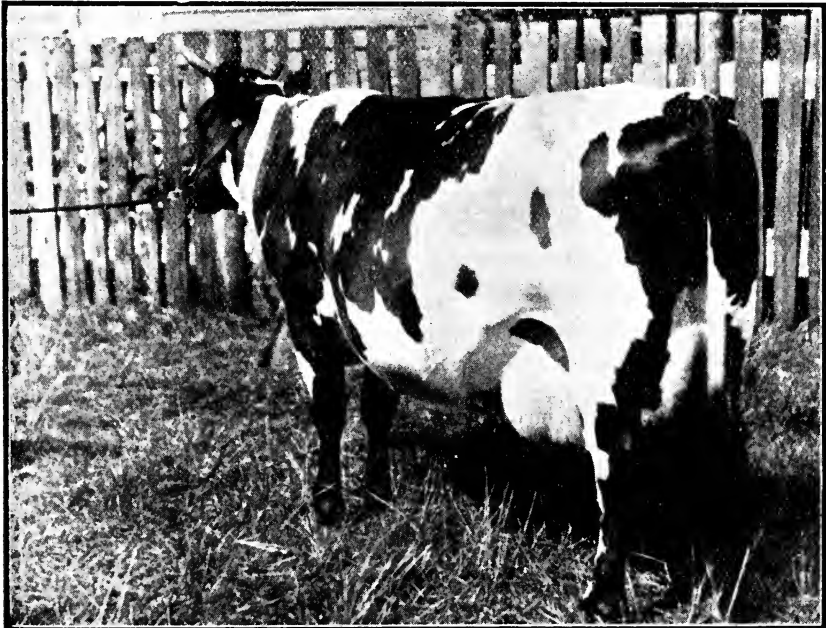
Since the clearing of these lands a gradual decrease in fertility has been going on, owing to its surface being exposed to the wasting effects of heavy downpours of rain, floods, droughts, winds, and other local causes, the soil in some instances being so much impoverished as to yield only pasture for grazing purposes, whereas other sites, which receive the drift and diluvium carried from the former, are rich lands especially applicable to cultivation.

For years after the opening up of these coastal lands, wheat growing was one of the most important articles of agriculture. In proof of this one need only mention that there were quite a number of flour mills on the South Coast between Bulli and the Shoalhaven. Prior to the forties "wind power mills" were in use, and although these mills were fitted up so as to produce excellent flour, there was not sufficient constant winds to give satisfaction. Therefore Messrs. Peck and Palmer erected a mill on Para Creek, near Wollongong; Mr. George Brown followed first with wind power and afterwards with steam power at Dapto; and this advance was followed up by Messrs. Osborne and Graham in Wollongong. As has been mentioned Captain Hart's mill was working at Jamberoo. A Mr. Blay, who was an engineer at Hart's mill, erected a windmill on Griffith's Hill, Kiama, for Mr. Owen, and worked it for a few years, but, becoming dissatisfied with the wind, he erected a steam flour mill at what is now known as Tanner's Creek. Later on Mr. John Sharpe erected the Bushbank mill, and after working it successfully for a time erected another mill in the town of Kiama. During all these years maize, oats, barley, rye,

REMINISCENCES OF ILLAWARRA.



Friesian Bull —Edinglassie (imp.). Color: Black and White.
The Property of Mr. Alexander Lamond, Berellan, Shoalhaven, N.S.W.



Ayrshire-Friesian Cow, Beautie. Color: Black and White.
Bred by and the Property of Mr. Alexander Lamond, Berellan,
Shoalhaven, N.S. Wales.
(For further particulars see Appendix.)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

potatoes, and pumpkins were being produced, and at times gave the whole aspect a most luxuriant appearance, besides supplying the settlers with invaluable crops, averaging uncommonly well as regards quantities and values.

The grape vine was also tried in a few places in Illawarra, the most successful by Mr. James Robb, on his Riversdale Estate, near Kiama. Mr. Robb had got hold of the idea from a Mr. M. Peron, a French scientific voyager, who had previously placed Mr. Macarthur, of Camden, under a debt of gratitude for showing him how to produce high-class wine. Mr. Robb engaged Mr. Nicholas Craig, and spent a lot of time and money experimenting with the grape vine, but eventually gave it up and commenced dairying and agricultural pursuits, for which he considered the district more suited.

Tobacco growing was also tried in several localities. Mr. Michael Hindmarsh, of Gerringong, was probably the most successful grower, but he eventually gave it up and adapted dairying and agriculture generally as being the best suited for the district.

Fruit growing in the forties and fifties was just as common as the production of milk and butter, as almost every home had its orchard. Mr. Spearing, of Bulli, and Captain Plunkett's Balgownie Estate were for years recognised as remarkable for their fruits. But it would require a long list to enumerate the many excellent orchards that were in full bearing between Bulli and the Shoalhaven River in the forties and fifties. Peaches were so plentiful that the farmers fed their pigs with the windfalls of the teeming orchards. Nothing could surpass the excellence of the peaches of early Illawarra either in size, quantity or quality.

To get back to the dairy cattle. Few things are more remarkable or so extraordinary as the evolution of the Illawarra breed of dairy cattle. We have extraordinary records showing the multiplication of the domestic animals which estimate the number of such animals throughout the colony in 1800 as being about 1044 head of horned cattle, 6124 sheep, and 203 horses; while in 1850, or about sixty-two years after the foundation of the settlement, there were in New South Wales alone 1,360,100 head of horned cattle, 7,026,000 sheep, and 111,200 horses.

But, when we turn our attention to the record of the doings of the early dairymen of Illawarra and the Shoalhaven Valleys, there is at once an absence of material by which those who have not been long associated with the districts, and the breeds and management of the various herds of cattle that have been used by the early settlers, could formulate an idea as to how the Illawarra breed was evolved.

There has already been given in this article an account of those men who went in largely for cattle raising in Illawarra, Shoalhaven, Argyle, Monaro, and the Lachlan River districts, and the vast opportunities which were at their command by way of possessing themselves of the best strains of the many breeds of cattle that were then to be found in Europe or the British Isles. It has also been pointed out that the localities where those men held their holdings were almost unique in the manner of building the stamina of our dairy herds, owing to the great variety of soils and climate within an easy radius from any given point of the coast to the westward tableland. Further still, those men soon grasped the idea of settling the people on the bush and scrub lands of their estates by letting out such lands on the clearing lease system. To give practical example of the system in vogue it will suffice for our purpose to mention one case, which, on the closest investigation, will be found to correspond with all similar methods of settlement on the bush and scrub lands of the coast.

In 1841 Mr. George Grey landed at Wollongong with a host of other emigrants, and after spending two years gaining experience he

REMINISCENCES OF ILLAWARRA.

decided on going on the land; his brothers and others arrived in 1843. He therefore journeyed to Sydney to meet them, having previously heard that Mr. James Robb, of Sydney, who had purchased the Riversdale Estate, Kiama, had determined to let that estate on the clearing lease system. The whole estate consisted of 1280 acres of bush and scrub land. Mr. Grey undertook the whole settlement for a term of years, and induced his brothers Henry and William and eighteen other families to come to Kiama and settle on this Riversdale Estate. Each family took up a small farm, and set to work to fell and clear sufficient for a small crop and to lay down grass to keep a few cows. Their wants were few, especially after the first year or two, when they began to grow their own food. They were good judges of cattle, and very soon each family began milking from ten to twenty cows, and as time went on and their sons and daughters grew up they were able to go further afield and take up large holdings, thus making room for the smaller settlers and later arrivals from the old lands. Those with large, industrious families, in the course of a few years either increased their holding by lease or purchase, and were soon in possession of dairy herds averaging from thirty to sixty dairy cows each. At the beginning of this system of dairying few, indeed, were in a position to make a keg of butter per week. The local storekeepers, however, bought it, and packed it in kegs and sent it by sloops to Sydney, the farmers receiving from 1s. 6d. to 2s. 6d. per lb. These prices, with wheat averaging from 5s. to 10s. per bushel, and maize from 4s. 6d. to 7s. 6d. per bushel, with pigs, calves, eggs, and poultry selling freely at good prices, soon made dairying the poor man's only hope.

True, there were more fascinating means of making money—to wit, station life, with its exciting yet free and active life in the open country beneath the sun's rays, far from the busy noise of the large towns and cities. Herds of cattle were kept at out stations, each numbering from 500 to 2000, or even 3000 head. They were under the charge of stockmen, two or three being attached to a large drove. The chief stockman had his hut, hut-keeper, his only possession being his stockwhip, saddle, hobbles, quart-pot, saddlebags, and horses. He could be recognised almost anywhere by his energetic gait, a free, daring, and somewhat reckless manner, a beard of ancient date, with long square-cut hair, a tweed jacket, tustian or strapped trousers, and a cabbage-tree hat securely fastened beneath the chin. His whip, the symbol of his office, had a short tapering handle with a tapering thong of 12ft. or 14ft., terminating with a "cracker." This formidable instrument in the dexterous hand of an Australian stockman, when mounted on a reliable horse, has terrific effect on the hide of a refractory bullock when endeavouring to break away from the mob. The whole art of stock-keeping in Australia in those times seems to have centred itself in feats of horsemanship, and this art consisted in a well-established and faithfully-kept compact between the two parties in the affair—that the horse shall look out for all dangers underfoot, including chasms in the earth 10ft. wide and of unknown depth, the rider guarding his own brains from overhanging branches of forest trees, which emphatically threatened them a dozen times in the course of a few minutes. However apparently perilous the work, it was very rarely that accidents of serious consequence occurred. Fond of his Mazeppa-like steed and his vocation, the stockman gradually grew to look with disdain upon the humble, plodding dairyman.

Nevertheless, the squatting king had his bitter experiences in New South Wales. When not harassed by droughts, he was often on the verge of ruin owing to fluctuations in prices. In the year 1835, when live stock had sunk to an unprecedentedly low value, the colonists had recourse to the only expedient—namely, boiling down the entire carcasses of some of their cattle for the extraction of the tallow, and thus turning them to account. This plan had been experimented on some time before by Mr. O'Brien, of Yass Plains, by which means

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

he fixed the minimum value on both sheep and cattle. The system proving profitable, it was regularly established, and enormous numbers of sheep and cattle have annually terminated their career in boiling vats. The process as described by our fathers is abundantly disgusting and revolting in its details; but as custom reconciles us to strange things, this butchery was simply regarded as an affair of business, to be despatched in the easiest and the quickest way, and was conducted with as much indifference as the cutting down of wheat by the farmers. Certain portions of the animals, such as tongues and rounds, were converted into salted meat for export; the gelatine, or essence of the boiled flesh, was sent in cakes to London to make soap. Neatsfoot oil was obtained from the feet, the bones and hides were also exported; and as for green ox-hide, it was used as a kind of universal social specific; it was the great bond that kept the edifice of domestic life from sad derangement. Almost everything was tied, held, or mended with it. It was also used as bags for packing the tallow from the boiling-down stations to the nearest port.

During seven years, from the commencement of the system in a general way—that is, from 1843 to end of 1850—in New South Wales and Victoria, there were thus disposed of 2,364,539 sheep and 261,169 head of horned cattle, which produced 673,943cwt. of tallow, representing a money value of £1,314,183. In a single year it has been calculated that not less than sixty-two million pounds of meat have been literally thrown away. In those days there was no value placed on the manural value of the offal, which was of incalculable value to the generations that were to follow. It seems extraordinary, and is certainly lamentable, such a state of things could and did eventuate.

Eminently pastoral nations, however, have never been great in the annals of civilisation, and seem precluded by circumstances from becoming so. Men became so many units, thinly scattered as they were over vast tracts of country, living isolated and apart from the humanising influences of social institutions, which are only found where numbers exist in neighbourhood. This has been conclusively proven by the great strides made in dairying in France, Denmark, Sweden, and Holland. The gregariousness of the people of these nations give the impetus to most of the modern improvements and inventions in connection with the dairying industry, and go to show that nations thrive where the pastoral is an adjunct to agricultural, mineral, manufacturing, and commercial occupations, where flocks and herds are seen in connection with arable lands, vintages, plantations, mines, factories, fisheries, and shipping. Hence it is with pleasure and hope, yea! even confidence, we look to the future of Australia.

CHAPTER V.

DAIRYING IN THE GOLD FEVER DAYS.

The importance of the dairying industry is now an established fact, and that we are living in a remarkable era as far as our pastoral and agricultural industries are concerned cannot be gainsaid. When we remember and reflect upon the value of our exports from 1833 to 1883 (a period extending over half a century-, and the means afforded for carrying such outside the confines of Australasia, and compare these decades one with another and the total with each advanced decade since, the power and the manner of conveyance, the value and condition of Australian produce, the whole may be summed up as denoting an historically important epoch. Wool, tallow, hides, horns, dairy produce, and minerals formed our staple products during the years 1833-49, and were conveyed on board ships registering from 600 to 800 tons, which, if successful, made annual voyages to and from London to Sydney. With the growth of time and progress of events, Australia has developed the dairying industry, which to some extent never could get a sufficiency of energy thrown into it to force the production of butter and cheese beyond local requirements from the discovery of gold in 1850 to the beginning of 1883. Since the year 1883 the wealth and vast improvement in the dairying industry have reached such dimensions that the great maritime nations of Europe are eagerly contending on our waters for the freight available in connection with this business. Here we have ocean racers of unrivalled capacity, symmetry, and steaming power, representing England, France, Germany, and America, competing in national rivalry for shipments from Sydney to the large and populous centres of the old world for our excellent butter and cheese weekly. What a marvellous stride in Australian commercial advancement! To sustain this dairy produce on a permanent and profitable basis it is essentially advisable that sound judgment should be displayed in the selection and management of our herds.

The value of scientific farming and artificial manures in promoting nutritious pastures for cattle is a matter for serious consideration at all times. The desire for entering upon the dairying industry is apparent all over the colony. Properties that were occupied solely for agricultural purposes or for cattle raising for market are in many instances completely transformed into dairying and mixed agricultural industries, which materially increase the output and give additional value to our yearly exports. Nevertheless, the business on a large scale is one of considerable risk to many of our colonists, and requires mature consideration and considerable practical experience before people should embark in the venture.

The selection of farms and runs is a matter of serious concern to the agriculturists who intends to make dairying the principal factor in his occupation, as dairy cattle cannot be raised on such a great extent of land in New South Wales. It will be on the class of cows that he possesses or intends to possess that much of his success will depend; therefore he should satisfy himself that his land will with judicious management, support the dairy herd and to spare each year.

Although much has already been written about the vast and almost incomprehensible strides made by Australia, it was not really until some years after the discovery of gold that anything approaching a boom began in industrial pursuits in the colonies. It is no part of our purpose in this article to describe life at the diggings—although many of the coastal dairy farmers took the gold fever and went into the fields, while the wives and families remained behind looking after

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

the farm and managing the business of the dairy—now extended far and wide from the original goldfield, or to detail operations conducted on those sites. We merely notice the discovery as a fact of high interest in the history of the development of dairying in Australia, and of immense political importance, altering the social condition of the colonies, and opening for the redundant population of Great Britain and Ireland a remunerative labor market, and a field for enterprise and speculation.

An old shepherd appears to have long visited Sydney at intervals, bringing pieces of gold to dispose of ; but he kept his secret, and no information transpired respecting the source of his wealth till the discovery was effected in the early part of the year 1851 by a returned and disappointed adventurer from California—a Mr. Hargreaves, who had been farming near Dapto, in Illawarra, in the early forties. This individual, a man of practical sagacity, was led to explore the Bathurst district by an impression that many parts of it through which he had formerly travelled bore a strong resemblance to the Californian gold-fields in aspect and structure. On February 12th, 1851, his opinions were substantiated by the discovery of gold. On April 3rd, same year, he reported his success to the Government. On April 30th the spot was located. On May 6th, the opening week of the Great Exhibition, 4 oz. of gold were produced at a public meeting at Bathurst. On May 22nd an official proclamation declared the rights of the Crown in respect to gold found in its natural place of deposit within the territory of New South Wales, a Commissioner, Mr. Hardy, being appointed to issue licenses—monthly, at the rate of 30s. each—legalising, on certain terms, the search for it. June 2nd Mr. Hardy arrived on "Summerhill," the site of the first Australian goldfield.

For this discovery and making good his claim as being the first man on payable gold in Australia, Mr. Edward Hargreaves was rewarded by the Government with £500, and he afterwards received a vote of £10,000 from New South Wales and £2000 from Victoria. During 1851 a solid lump of gold weighing nearly 1cwt., worth £4000, was found at Merco Creek, near Bathurst, by an aboriginal shepherd in the employ of Dr. Kerr, and fresh discoveries of gold were made at Ophir, Turon River, and Braidwood.

To show the extent of the gold fever in New South Wales, there were within ten days of the discovery being proclaimed 400 adventurers on the Ophir ; these had increased in another fortnight to 2000, with hundreds on the way. At one time there were as many as 20,000 estimated to have been assembled on the banks of the Turon River. Sydney altogether changed its aspect. Shops shut up, warehouses closed, and regular employment came to a standstill. Constables threw down their truncheons by the dozen, crews ran away from their ships, shepherds left their flocks on the runs, servants and apprentices absconded ; until at last magistrates, lawyers, physicians, clerks, and tradesmen joined the crowd of laborers, and went off across the Blue Mountains, using all manner of conveyances for themselves and their trappings—carriages, gigs, drays, carts, wheelbarrows, &c.

But having indulged the most extravagant expectations of the facility with which wealth might be acquired, while wholly unfitted for the rough life and hard work necessary to procure any return, many were seen in a few weeks wending their way back to their deserted homes and families in miserable plight. However, £3,000,000 was obtained in about twelve months, which is a magnificent item. Yet it was largely a lottery, in which there were great prizes and many blanks. Though a somewhat equable diffusion of the precious product marked certain districts, such as the banks of the Turon, where it was compared to "wheat sown in a field," the distribution was generally capricious.

DAIRYING IN THE GOLD FEVER DAYS.

Flour was 6s. per lb., butter 2s. 6d. per lb., cheese 2s. 3d. per lb., maize 12s. 6d. per bushel, bran 6s. per bushel, oats 20s. per bushel, potatoes 1s. 6d. per lb. It was impossible to obtain farm laborers. An instance is mentioned of a squatter having visited the goldfields with a view of obtaining labor to shear his sheep. After discussing the situation with a party of diggers, having learned the current rate of wages usually given by the squatter for shearing sheep, the diggers, eight in number, offered the squatter 15s. a day and tucker as cook for the camp.

In 1847 Governor Sir Charles Fitzroy arrived in the colony, and shortly afterwards Lady Fitzroy was killed by accident at Parramatta, which cast a gloom over the whole of Australia, and justly so; but such things, however sad in themselves, do not prevent the progression of a country such as New South Wales was in those days. Emigrants of the very best description continued to arrive from Great Britain and Ireland. Many of these good people came to join their friends in the Illawarra and Shoalhaven districts. The prices of dairy produce fluctuated, but speaking generally there was a good market to be had for butter, cheese, and bacon throughout the forties and fifties.

No great changes took place in the methods of dairy farming in New South Wales during the thirty-two years which otherwise characterised the colony as being a period of its greatest development, one of the chief of which was the enormous amount of gold won from the earth in a phenomenally short space of time, creating a demand for milk to supply the chief towns and cities of the country, which had sprung up like mushrooms owing to the great influx of emigrants into Australia from all parts of the world then known to civilisation.

The increase in wages now earned by the working classes as compared with the previous years rendered them better able to purchase a regular supply of fresh milk, butter, and cheese, which, notwithstanding their importance as an excellent diet for most adults, and also most necessary to the healthy growth of children, was denied them owing to the low prevailing rate of wages given to the working classes and farm laborers. In fact, the very best mechanics had been earning a low wage. The development of roads and railways enabled supplies to be obtained from a widely increased area. On all arable farms a number of cows were profitably kept, and butter and cheese made and the skim milk used to advantage in rearing calves or feeding pigs.

CHAPTER VI.

ON FEEDING AND PRODUCTION.

The question of conformity of type as an index of utility in dairy cattle—that is, whether it can be relied on in indicating the merits and defects of all our dairy animals or not—has been often discussed. It has not, however, been positively demonstrated on our show grounds that, from a critical examination of the exterior points of an animal, a fairly correct estimate can be made of the quality of the interior or hidden points. Certainly, the study of the points of the animal, and their relation to one another, gives the student an idea of the importance of correlation, symmetry, animal mechanism, and quality, a knowledge of whose fundamental principles is an invaluable aid to the feeder and breeder. A study of conformation also trains the mind and the eye to clearly discern and estimate the effects of food in the process of developing dairy type or conformation.

For example, the barrel of a dairy cow is relatively much larger, deeper, and, if anything, longer than that of the beef animal. There is a considerable difference in the spring of the ribs on the beef and dairy animal. The ribs of the dairy animal seem to spring out from a lower line on the back than in the beef animal. It may not be actually the case, but it appears so in viewing them from behind. The posterior divergence of the ribs of the dairy cow is due to the fact that this animal has a relatively larger development of the digestive machinery than the beef animal.

The highly cultured maternal instinct must also be kept in mind, for as a dairy cow milks at least ten months of the year she must carry and supply nutriment for a growing foetus for seven months of this period in addition to producing several times her own weight of milk. The thigh is very thin from side to side, allowing a wide space between the hind legs, permitting the development of a very large udder. Take the young dairy heifer taught to drink large quantities of skim milk and to digest coarse food; its belly is often despised by those who are unacquainted with dairy stock raising. But is it after all a fault? If accompanied with a well sprung rib and well defined back and loins, depth of flank, even though a thick neck, and other marks of constitutional vigor may follow we must not condemn the heifer with a big belly, as it is often most desirable, indicating capacity as a feeder and user of foods.

A gentleman once asked the late Rev. Samuel Marsden: "How are milk vessels developed in heifers? How is the milk flow stimulated?" The reply was: "Bring them up in the way they should go, and when they are old they won't depart from it; that is to say, if they are like mine—well-bred dairy heifers. By this I mean, bring up the heifers to consume large quantities of milk-producing food. However, always bear in mind that there are some kinds of food that will produce growth, but not fat. Use such foods."

Science and experience both agree that if we expect to produce milk cheaply and abundantly, not only must we have good dairy cows which are suitable for the business, but we must also fit the feed to suit the cows, as it must be ever remembered that they produce the best balanced food which possibly we partake of in the food elements—namely, carbo-hydrates, fat, and protein.

The cow cannot of herself change her nature, or her milk. For, owing to circumstances, the unfortunate cow has to depend on her owner for the quality as well as the quantity of her food. Not-

ON FEEDING AND PRODUCTION.

withstanding this, into every pound of milk she is obliged by a law she cannot escape to put certain quantities of casein or curd—which is almost pure protein. Where does she get it? From her food. How can she get it from her food, if the food given her does not contain it? All the foods rich in protein are expensive to buy, more so at times than others. These foods rich in protein consist of cotton seed, wheat seed, and corn seed meals. But where the object is, such as that on a dairy farm, to keep up the yield of milk, and at the same time to leave more of the resulting money with the farmer, the plan is to grow equivalents for these foods in the form of fodder on the farm. Theoretically, therefore, the plan is to grow maize, horse beans, and sunflower heads, and put them into a silo as a balanced ration, the maize for carbo-hydrates or starch, the horse beans for protein, and the sunflower heads for fat. The same object is striven for in peas, vetches, &c., mixed abundantly with maize or barley. Good results have been obtained from sowing flax, amber cane, and oats. This combination is said to produce an abundance of protein without excessive oil. The amber cane is cut when fairly out in head, and the flax seed when about half grown.

It may be said of all dairymen who feed their stock with a view to profitable returns that if they find their methods are wrong they do not blindly adhere to them. They have already learned that the true rule for human guidance is: Never compare things that differ, which means that every difficulty, every situation, is governed by its own law. This applies wonderfully to the law of dairy farming—we cannot now compare a buffalo with a Jersey. We have much evidence to prove that it often happens that a heifer calf, raised from a young cow before being developed into a milker, proved to be a very ordinary milker; but heifers subsequently raised proved to be excellent milkers. It would seem, therefore, that it is necessary for a sound milking habit to be acquired by the dam before it becomes transmissible to her progeny. Another point of some importance is the effect of high feeding upon the future usefulness of the cow and her progeny.

The fertility and producing power of the land is the farmer's capital; and the quality and productiveness of his stock are his profits. A poor soil resists a drought much worse than a rich soil. It does not pay to hand feed a poor herd of cows, whereas it pays to hand feed a good herd.

The three agencies that are required to act upon the soil and the cow in order to convert both into profit for the benefit of the farmer are: The sun's rays, rain, and the digestive juice of the cow's stomach. Of the first we have abundance, of the second a great scarcity; of the third we have Nature's assistance if we but economise instead of overtaxing the cow's digestive organs.

The question of overstocking has been over and over again discussed by dairy farmers and pastoralists generally in New South Wales for upwards of three-quarters of a century. Prior to the discovery of the Bathurst Plains in 1813, the subject of overstocking was much discussed; but once an opening was made into the interior of the country the discovery of new country was the all-absorbing topic among settlers, until the boiling down works were established by which means the surplus stock were disposed of at a profit partly owing to the cheapness of grass country out west.

The terrible drought of 1867-69, which raged with varying severity throughout the eastern coast of Australia, and which has been admitted by the oldest colonists to have been the worst for stock of all descriptions ever known, ought to have taught the settlers a lasting lesson on the ill effects of overstocking when ample provision is not

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

made to combat the visitation of these droughts, no matter how often they may make their appearance.

At no period in the history of New South Wales could the farmers or settlers honestly assert that they did not have in their possession a certain number of dairy cattle which were worthless for the purposes for which they were being kept. The question at once arises, Why are they kept? In days gone by this practice was excusable, inasmuch as banks and loan companies used to advance money on the number of cattle on a farm or station without inquiring as to their quality. In future it must be quality, not quantity, which is to guide advances; and as there cannot be quality without both breeding and feeding there should be a silo and a barn on every farm, even should an Act of Parliament be required to place them thereon. A drought is often long remembered; but can we acknowledge that, even from a dispensation so severe, an element of value has ever been elicited? Or that, whilst contemplating the sad wreck of herds, caused primarily by overstocking, the dairy farmers will ever bring that judgment and skill which we are graciously permitted to acquire for the purpose into play in order to counteract these evils?

The injury done to the farm itself by the practice of overstocking is very serious; amongst other reasons because it both propagates and encourages weeds and inferior grasses. Although a dairy cow, almost apart from any other animal of the farm, is a great eater, devouring every kind of food coming within the range of feeding stuffs, still there are herbage she will not touch, and these plants are, therefore, often left in sole possession of the ground, where they grow and seed with tenfold vigor.

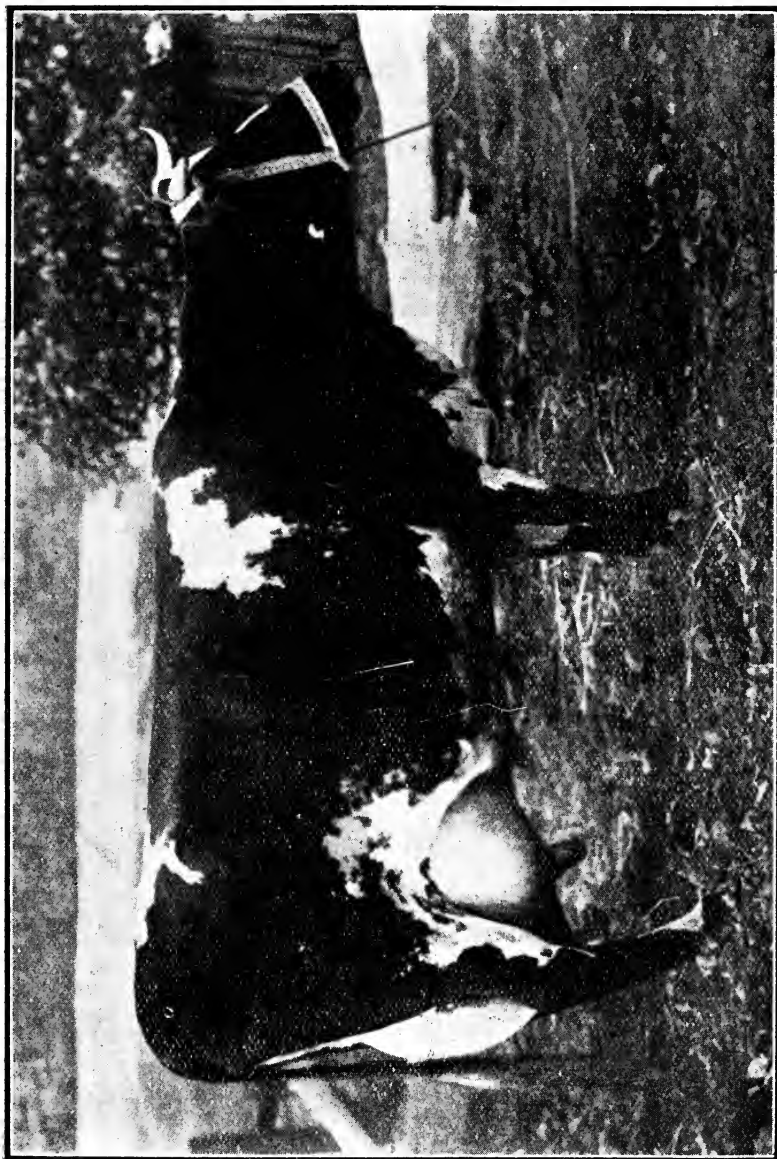
There is, all must admit, some difficulty in arriving at the exact number of dairy cattle that a farm will carry and keep in top condition in consequence of the varying of the seasons with respect to rain; but if those who have farms impoverished by overstocking desire to change their system, let them at once reduce the number of their stock to a quantity which the farm will carry in average seasons, and then when a good season presents itself, store up the surplus instead of buying up extra stock to eat it off.

In the late eighties the dairying industry gave steady and profitable employment to some 12,000 of our people. The machinery and plant employed in its production were valued at £130,000. The cows regularly in profit were estimated at 800,000 head. The annual production of butter was estimated at 21,000,000lb.; cheese, 5,000,000lb.; bacon and hams, which are adjuncts to this interest, 5,000,000lb.

Without entering into the cost of the land used for the purpose of dairying, which was large, and the most valuable on account of its superior quality, let us examine into the value of the cattle at a moderate estimate. Those in the production would realise at £4 per head £1,460,000, and the balance in the progressive stages at £2 each, £870,000. This estimate proves that the cattle and plant were worth £2,460,000. Such were the interests vested in the manufacture, sale, and export of dairying products.

Having thus reached the surplus stage in production, it is worth serious consideration as to whether we adopted the best methods—then available—of getting rid of our growing surplus. A stage in production had been reached where the best thoughts of those engaged in the business were seriously demanded to give ear and help where necessary towards still further development, and thereby avoid a collapse of the industry, owing to the extraordinary progress made during the previous few years—from 1880 to 1885.

Modern invention was rapidly reducing to terms of equality the



HONEYCOMB,

A Model Dairy Cow, bred by and the property of the late Mr. John Lindsay, of Kembla Park, Illawarra.
By Earl Beaconsfield, dam an Illawarra-bred Cow.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

production of good butter to those who could purchase the necessary machinery and appliances. Whilst the farmers were devoting much attention to the breeding of cattle and the methods of production, they almost lost sight of the ever-growing surplus that was being produced in the country. It is therefore not surprising to find that meetings were held in various parts of the country to consider and if possible grapple with the question of surplus as it then presented itself to the dairymen of the colony.

Co-operation had not been working out the profits the farmers had reason to anticipate. The dairymen were feeling the pinch of the times owing to many tons of the staple product, butter, remaining unsold at the end of each month. What to do with this butter? The people of Sydney were increasing in numbers, and desired to be supplied with fresh country milk. It was an important epoch in our history.

The South Coast and West Camden Co-operative Company had installed a refrigerating plant on what was then known as the Bell-Coleman principle. The object of this movement was an intelligent one, viz., the storage of the farmers' butter with a view of placing it before the grocers of Sydney on sale morning in the best presentable form possible. This plant, however, was no sooner installed than the management rushed into the frozen meat trade—an industry apart altogether from dairying, and for which the machinery and plant was in no way suitable. True, the company turned their premises into a storeroom for agents and butter speculators. The management also went into the milk trade, and, after losing a lot of money in initiatory work, sold out to the F.F. and I. Company just at a time when the concern was commencing to pay. Yet another gigantic bungle was the installation of an enormous refrigerating plant on the same principle as the former one, just at the time when this system of refrigeration had become obsolete all over the world. This plant was never used, and it remained within the walls of the building for many years, and was eventually sold as old iron, the cost of its conversion into an ammonia compressor being too expensive and too unwieldy an undertaking for the company.

Without further reference to what was done by the management of the old South Coast and West Camden Co-operative Company, it may be as well to state what ought to have been done, and which was unfortunately left undone. It is, therefore, the time for the examination of the proposed methods set out at the inception of the co-operative movement on both the coastal and tableland districts of New South Wales, to accomplish the end desired by the people, many of whom had recognised that the policy of the middlemen and agents was to divide the producers that they might control the situation. There is and must ever be an identity of interest between the producers of every district. But an identity of interest will also be found to exist among the agents, yet in a different direction, and quite antagonistic to that of the producer. They may declare themselves as belonging to the people, sacrificing their all for them; but that, as now, was a sceptical age, which would accept nothing but as it "panned out" on examination. Co-operation had done much, and was capable of doing much more than had been so far accomplished, so far as the production, sale, and export were concerned, if it had been properly directed during the years under review.

Briefly, it did nothing towards the establishment of a large central market, though the advantage of such, conducted on proper lines, was never disputed, both on the ground of cheapness and to afford an opportunity of comparison. All sellers and buyers could have met in such, with great advantage to all concerned. It was also intended that on the floor of this market all produce would be graded and sold

ON FEEDING AND PRODUCTION.

according to merit, and a rule established that would prevent produce being returned to the floor once sold, as what is once sold off co-operative floors should not come on to them again.

Such was the beginning of the first great co-operative movement in New South Wales. What might have been accomplished, and what was accomplished by the dairy farmers of the South Coast and West Camden districts in their honest desire to establish their own markets in Sydney during 1878-88 is left to those who can calculate the success of the commission agency system during that same period as compared to the great losses sustained to the cause of co-operation as a system of progression. It has often been shown that from the greatest business failures we have seen the greatest businesses rise up, at it were, Phoenix-like out of the ashes of the old ruins. The present Coastal Farmers' Co-operative Company is one other example.

After the heavy rainstorms and disastrous floods of the early seventies, the pasture lands which had previously been exposed to atmospheric influences through excessive cultivation, began to show signs of weakness. The natural sequence of soil weakness is deterioration of plant life. The plant may appear to grow and flourish as usual, but when it has reached Nature's great laboratory—the cow's stomach—it will be found wanting. The final result is that the dairy cattle do not appear to the breeder's eye so vigorous as similar cattle did but a decade previously.

Hence the dairy farmers all along the eastern seaboard from Bulli to Twofold Bay, and the whole of the southern tableland, began to find fault with their cattle instead of their own management. The older school of Australians began to talk in private about the herds of cows seen throughout these localities in the forties and fifties. Soon these notions became popular and caught the ears of the pressman and the after-dinner speaker. Certainly there were a few who were never carried away very easily by claptrap, and never caught the new blood cattle mania, and afterwards reaped their reward. But it must be admitted that very few herds in the localities above mentioned which escaped from the injurious effects of the beef cattle mania of the decade 1870-80. True, the descendants of a few imported bulls turned out very well indeed; but, generally speaking, deterioration and disease followed in their wake, which took at least another decade to undo the harm done by some of those importations, especially along the coastal districts.

Prior to these importations there were to be seen the finest herds that could be found in any part of the world on the flats and on the hills of Illawarra and the Shoalhaven Valleys. If one was to sit down and enumerate these herds it would fill a very long list. They were not by any means showmen. Very few troubled about showing their cattle. They had good cattle nevertheless.

The "Major" cattle, which derive the name from that bull already mentioned, purchased by Mr. Evans, sen., at an auction mart in Sydney in 1862, who got most of his reputation from bulls previously on the scenes in New South Wales, are now beyond cavil, just as bulls purchased from his son, Mr. Evan R. Evans in years after as "Major" bulls got their character from bulls purchased by him from the A.A. Co. and Mr. Cox—notably the bull "Solon."

Mr Henry Fredricks, who had a celebrated herd at this time, the foundation of which had been laid from stock bred by Messrs. Henry Osborne, Andrew McGill, and Duncan Beatson, purchased the first young Major bull from Mr. Evans. This young Major bull seemed to "nick" admirably with Mr. Fredricks' herd, and as soon as his heifers appeared at the Kiama saleyards the fame of the bull "Major" went forth. In fact Evans' bull was never even named "Major" until

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Mr. Henry Fredricks had sold his bull to Messrs. Cole Bros., of Jamberoo. Before Cole Bros. bought "Major" he had been leased to Mr. Jas. Spinks. This Major strain was quickly snapped up by all those breeders who had burnt a hole in their pockets over the purchase of the beef bulls a few years previous. As everyone was anxious to get hold of a Major bull, it is just possible that many bulls which were sold by auction and otherwise disposed of were but distant relations of that much-boomed animal during the seventies and eighties.

In 1872 Mr. Evan R. Evans, of Penrose, Dapto, was smitten with a desire for new blood. He made several purchases. Among his selections was a roan bull bred by Mr. E. K. Cox, of Fernhill, Mulgoa; a roan bull and a red bull from the Australian Agricultural Company of Gloucester. All these bulls were used in Mr. Evans' herd during the late sixties and the early seventies.

In the late seventies and the early eighties many of the dairymen of the colony went in for Ayrshire bulls, many of their selections coming from New Zealand and Victoria. A Mr. Pemell, a Sydney millowner, made several importations; and Dr. Lambert, of Berrima, Mr. H. C. Antill, Picton, and the Bodalla Estate also imported direct from Ayrshire (Scotland).

But probably the most notable bull of the Ayrshire breed that came to the coastal districts in those days was purchased in Victoria by Mr. John Lindsay, of Dapto, in Victoria, in 1878, who sold him by auction in Kiama in 1883 to Mr. John Grey, of Berry. This animal was named "Earl Beaconsfield," and when crossed with Illawarra cattle the progeny was unsurpassed as dairy cattle. The Beaconsfields, as they were called, were to be found competing in every show ring with a fair amount of success among the Ayrshire classes.

We have numerous illustrations of cows in this book full of the Earl Beaconsfield blood; among the number is Mr. George Tate's celebrated dairy cow "Lucky," on page 149.

CHAPTER VII.

ON THE REARING OF HEIFER CALVES.

The rearing of heifer calves has always been regarded as the most important branch of dairy farming. By paying attention to this department one has the power of making his herd of cows just what he pleases, and can regulate them to suit his requirements as regards the production of dairy produce. He can then rear cows that will best produce either milk or butter, as well as having a breed of animals suited to the land that is to support them. Besides this, he will better understand the quality and nature of his stock, which is a matter of paramount importance.

If a dairy farmer understands the care of his heifers he will seldom find them deceptive in the milk bail. He will also be in a position to guard against ailments. Take, for example, white scour, which is the greatest scourge to which calves are subject (and which has a telling influence on the animals in after years); this disease has to be most carefully guarded against by an experienced feeder, or if we may use the term, a capable nurse. Care should be taken not to change the food of calves too suddenly, but accustom them to what is coming by slow gradations, giving them a small quantity at first, and increasing it afterwards. The quality of the food, too, ought to always be a point for due consideration in calf-raising.

The chief object of the food supplied to young heifers is to produce bone and muscle, as the production of a large amount of fat is not desirable. The food, therefore, should be rich in albuminoids, phosphoric acid, and lime. The milk, called colostrum, which Nature furnishes for the young animal at birth, is exactly fitted for the purpose designed. The key is given in the comparison of the cow's milk throughout her milking period as to the food the calf, the heifer, the cow, should receive through life.

After the calves have been weaned it is well to run them for some time on what may be termed good limestone country, where they will experience a distinct change of climate from the one in which they have been bred and received their early training. All this is so well understood, and is so entirely a matter of routine, that it requires no elaboration just now. As has been stated, the rearing of one's own stock gives the dairy farmer a great advantage, as most of his heifers will turn out well, and if, when they have brought forth their first calf, and he is not satisfied with them, he can sell them off. This last resort, however, requires sound judgment, as many a valuable cow was far from being a success on her first calf, or second calf as a matter of fact.

To describe the points of a dairy bred calf is about the most difficult task one ever set oneself. For example, who has not seen very handsome, well-grown calves, turn into very inferior cows, and ill-shaped, poorly fed calves develop into first-class cows. Therefore, we will pause here for a moment and endeavour to describe its dam.

Even to debate all the favourite points of a cow would require rather a large-sized volume. It is said:—"When you see a number of prominent good points in any animal, examine it carefully and you are certain to find out a few very bad ones, the bad ones often being hidden from view at first sight." We shall, therefore, only introduce the following marks which so often distinguishes a good dairy cow from that of cows of the beef-producing types. They are as follows:—

Head.—Forehead broad, eyes full, square muzzle, face fine and rather long from eyes downwards; cheeks and jaws flat and clean.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Neck.—Medium length, fairly straight on top, fitting nicely on the shoulders, deep and free from loose hanging skin.

Forequarters.—Fine, with plenty of lung room on top and between the forelegs to ensure constitution.

Back.—Uniform, level, broad on the loins, pelvic arch well defined.

Body.—Large and deep behind, underneath, and in front of udder.

Flanks.—Flat and deep sitting, even on body and thigh.

Udder.—Large, and showing well forward and up towards the vulva. Soft and free from knots when empty.

Teats.—Of good length and thickness.

Milk Veins.—Long, thick, and irregular.

Escutcheon.—Of good quality.

Thighs.—Long, flat, and deep.

Skin.—Fairly thick, soft, and pliable.

Almost the same treatment applies to the young bull as to heifers. When the bull calf is weaned he should be kept by himself quite apart from the females of the herd. Says Warfield :—“ The first crisis in the young bull's life comes when he is between nine and twelve months old. He is then passing from a calf into a bull, and the change is sure to make him restless and inclined to run about, and if any cows or heifers are pastured near, especially if they are allowed to run out when in heat, the youngster will worry off all his flesh and get himself thoroughly out of condition. During this period the young bull is apt to get uneven and ragged. This is because they are passing from the round, plump, comparatively formless period of calves, and settling down into a well-fixed character. Not a few seem to go through what may perhaps be termed a progressive development. That is, some parts of the body seem to outgrow more than the others. This often makes a bull calf of this age more faulty than at any other time in his life, before or after.”

At this age many of our young bulls have been pampered to such an extent that they become totally unsuited for the purpose for which they were kept—namely, the production of suitable dairy animals. Young bulls should receive a liberal supply of good food, but on no account should they be overfed.

CHAPTER VIII.

ON BREEDING DAIRY CATTLE.

The objects of the dairy farmer, like those engaged in other commercial pursuits, should always be followed on sound common-sense lines, with a view to raising the most perfect stock and realising the highest return.

Generally, dairy farmers depend more on the products of their herds in the form of the marketable values of milk, butter, or cheese than on the sale of stock, which often comprise young cattle, horses, pigs, poultry, and sheep—the two latter classes of animal being, as a rule, grouped as subsidiary aids to the farm. They shape their operations more towards the raising of dairy products than the raising of dairy cattle, in most instances limiting themselves to the production of just sufficient animals to suit the requirements of the farm. All practical dairymen, therefore, base their calculations on their surroundings and the circumstances which govern soil, climate, and rainfall, and make for the productiveness or sterility of their farms. The farmer has, then, to decide what breed is best adapted to return a substantial profit, or as Bakewell happily expressed it: "The selection of the best machine for converting herbage and other cow food into money."

The difficulties of selection are narrowed down in most of our dairying centres to two points namely, those of dairy type and constitutional vigor. To buy or breed common animals of mixed qualities and use them for any and for all purposes is too much like a manufacturer of patent medicine advertising to cure all ills with the same drug. Again, it is one thing to have a clear and definite aim in view when commencing, but quite another to understand the means that ought to be used. In practical experience there are many sad disappointments. The experience, therefore, of any one man goes but a little way towards a thorough knowledge. Despite the seeming scantiness of what has been written on this subject, the knowledge does exist somewhere; not all that has been done by breeders has found its way through the press. The improvement of herds has attracted the attention of many dairymen for years past.

Refinement of intellect is less an outstanding feature of successful dairying than plodding, patient industry informed by sound judgment. It is matter for regret that breeders have been so individualistic, as if they were afraid others might profit by the knowledge they had laboriously acquired. Beyond a few random commonplaces they have left nothing to guide future stock raisers. But observation of the stock in use enables us to arrive at conclusions regarding systems. This makes it safe to say that first by adopting a wide plan of selection, second by judicious coupling, and third by careful in-and-in breeding, they obtained the type desired.

It is absolutely necessary, however, to have ample scope; without suitable feed and pasture, breeders are simply courting failure. At times abundance of feed is required to develop the milking qualities of an animal. The chief art in breeding is breeding for dairy form or type. Some authorities may be guided by what they can detect in the head, others by their impression of the udder or teats; others, again, are swayed by the formation of the organs of digestion, while many authorities take general appearance as their sole guide. One of the first points to be considered in breeding is similarity. It is by virtue of this law that the peculiar character, qualities, and properties of the parents, whether external or internal, good or bad, healthy or

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

diseased, are transmitted to their offspring. "Like produces like!" But while experience teaches the constancy of hereditary transmission, it teaches just as plainly that the constancy is not absolute and perfect, and this introduces us to another law, namely, that of variation. All beings possess a certain flexibility of organisation. In a state of nature variations are comparatively slow and infrequent, but under domestication they occur much more often. Climatic conditions and food also affect the matter.

If all breeders had exercised a tithe of the shrewdness possessed by the patriarch Jacob we would have a much better state of things to-day, and there would be less need to trouble over the next law, that of atavism of ancestral influence. We say "trouble" advisedly, because, as a rule, not the best qualities of our dairy cattle are reproduced in this way. This is borne out by the proverbial remark that however good a cow may be, there is no telling beforehand what sort of a calf she will have. Obviously, therefore, certain peculiarities may be dormant for a generation or two, and then reappear in the progeny. This pertinacity with which hereditary traits cling to the animal for generations, in a latent, masked, or undeveloped condition is remarkable.

The next law deals with heredity, with the relative influence of the parents on the offspring. Some writers maintain that only the male parent is capable of improving the breed; others that the offspring bears the greatest resemblance to that parent, male or female, which has exerted the greater generative influence, and that the only certain agents are the best powers of both sexes. Others assert that each parent contributes to the formation of certain structures and the development of certain qualities. Further, they hold that the male parent chiefly determines the external characters, the framework, bone and muscle, organs of sense and skin and locomotive powers; while the female is responsible for internal structure, the vital organs and functions of secretion and nutrition. On this point Dr. Carpenter says: "Although no universal rule can be laid down, yet independent observations seem to establish that such a tendency has real existence." Much confusion is often shown in arriving at any definite understanding on this law owing to instances, sufficiently common among the lower animals where the offspring exhibit more or less distinctly over and beyond the characters of the male by which they were begotten, the peculiarities also of the male by which their mother at some former period had been begotten.

The next law is that of in-and-in breeding, a system by which the best or worst characteristics of a breed may be intensified according to the wisdom or otherwise of those who are intrusted with such a two-edged implement. It has long been a disputed point whether the system of breeding in-and-in or the opposite one of frequent crossing has the greater tendency to maintain or improve the character of stock. The term in-and-in is often very loosely used, and is variously understood; some confine the phrase to the coupling of those of exactly the same blood, namely, brothers and sisters; while others include in it breeding from parents and offspring; and others simply employ the term to embrace those of more distant relationship. For the latter the term breeding in, or close breeding, is deemed more fitting and advantageous. It is certainly Nature's plan of fixing type, for among gregarious ruminating animals in a state of nature it is largely practised with no apparent ill effects from generation to generation, probably for centuries.

The practice of crossing, like that of close breeding, has its strong and its weak side. Substantial arguments can be brought both for and against it. Judiciously practised, it offers a means of procuring animals superior to and more profitable than those of any pure breed. Crossing is generally understood to refer to the alliance between ani-

ON BREEDING DAIRY CATTLE.

mals of different breeds, such as Durhams and Ayrshires, or the Jersey and Ayrshire. But these crosses are much modified by the fact they are bred for precisely the same purpose, that of the dairy. They have, therefore, nothing excessive or contrary to Nature. Breeding in line is considered the best for the majority of dairy farmers to adopt, which means neither to cross too freely nor to breed from too close affinities, except in rare instances and for some specific and clearly understood purpose, but to breed in the line, that is, from the breed or race best adapted to fulfil the requirements demanded. Were this plan more general, and a system of letting or exchange of males established among the dairy farmers, as in days gone by, the cost would be brought within the reach of most dairymen. Whether this supposition be correct or not there can be little doubt that if we understood fully all the influences at work, and could estimate fairly all the data, we might predict with confidence the characteristics of the progeny from any given union where line breeding had been followed for any considerable time.

In all our more modern treatises on dairy cattle breeding much importance seems to be placed on the philosophic supposition that "similar causes bring about similar effects." However plain this may appear to the "casuist," it always presents many difficulties to the breeders of stock. It is the confusion of these much paraded laws of Nature that has led many of our best breeders to recognise pedigree as only valuable in proportion as it shows an animal to be descended, not only from such as are purely of its own race or breed, but also from such individuals in that breed as were specially noted for the characteristic excellencies of that particular breed.

The great mistake lies in endeavouring to achieve perfection in their herds too rapidly, whereas all improvements should gradually be effected by gentle rather than by violent approaches. In these improvements much is of that cannot be explained away; for instance, when breeders talk about "purity of blood," they simply mean that the animal is of some distinct variety—that it has been bred from an ancestry all of whom were marked by the same peculiarities and characteristics. But when we are called upon to explain why the blood of a male and female of the same species but of different breeds will or will not unite successfully in the production of their offspring we are face to face with a difficult problem. The qualities of an animal depend upon its organisation and endowments, and the blood—as it appears to us—is only the vehicle by which these are nourished and sustained. The blood, however, varies in quality and composition—the quality is not easily explained—according to the food eaten, the air breathed, and the exercise taken. If therefore, one dairy bull is better than another, it is because there is a surprising amount of secret and unthought-of quality in its blood which has not yet been properly demonstrated by physiologists that often proves sufficient to impregnate the blood of many subsequent generations.

Who has not observed the lethargic temperament of the Shorthorn in contrast to the sprightly movements of the Ayrshire, or noted the results of the greater quietness and docility so highly valued in the crosses of these two breeds? The lethargic temperament is inseparably connected with an aptitude to fatten. The old Teeswater cattle were remarkably deep milkers, showing more the characteristic of Bakewell's Longhorns. In that respect it does not appear that good grazing points necessarily conflict with dairy excellence. As improvement in feeding qualities was gained, the production of milk in most cases fell off, and although some families for years embraced many excellent milkers, the majority of them have long since deteriorated in proportion to their considerable improvement as meat producers.

The earlier Durhams introduced to this country were from the

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

very best milking families, and their descendants proved valuable for dairy purposes. By crossing them in various ways with the Ayrshires, Longhorns, Alderneys, dun-colored polls, and other breeds, including blacks, browns, magpies, and brindles which were to be had in large numbers at one stage in the history of this colony, the settlers had at one time or other the nucleus of probably a score of valuable breeds of dairy cattle if they had been intelligently managed for a few decades.

By breeds we understand, of course, such varieties as were originally produced by a cross or mixture, and subsequently established by selecting for breeding purposes only the best specimens and rejecting the rest. In time deviations become less frequent, and greater uniformity is secured; but a tendency remains greater or less in proportion to the time which elapses and the skill employed in selection, to resolve itself into its original elements, to breed back towards one or other of the kinds of which it was first composed. Thus in time a new race is formed.

Whenever any man of advanced ideas has attempted to establish a new breed of cattle, such as Mr. Walker, of Tenterfield station, he has invariably attempted to do too much in the time. The practice of close breeding which must be carried to a great extent at the beginning of the experiment should never be saddled with high production until type is thoroughly established. Both close breeding and high production when established too rapidly undoubtedly contribute to the liability of our domesticated animals to hereditary diseases, and when those possessing any such diseases are coupled, the ruin of the stock is easily and quickly effected.

Notwithstanding the importance of heredity in disease, it is also true that few diseases, in the strict sense, owe their development to accidental causes. Even such as are usually hereditary are sometimes produced accidentally, and in such cases they may or may not be transmitted to their progeny; and we have reason to believe that such accidents can be transmitted.

With variations it is different. Climate, food, and habit are the principal causes of variation in any marked degree under the control of man. These in turn are, doubtless, indirectly subservient to other laws, such as reproduction, growth, and inheritance, of which we have a very imperfect knowledge. This is constantly shown in cases of animals that have several young at one birth, the result of a single union with the male. Numberless hypotheses are put forward to account for variation. Darwin says:—"The reproductive system is eminently susceptible to change in conditions of life." To this functional disturbance in parents he attributed the varying or plastic conditions of the offspring. The male and female sexual elements seem to be affected both before and during the time the union takes place. But just exactly why is a question we cannot answer.

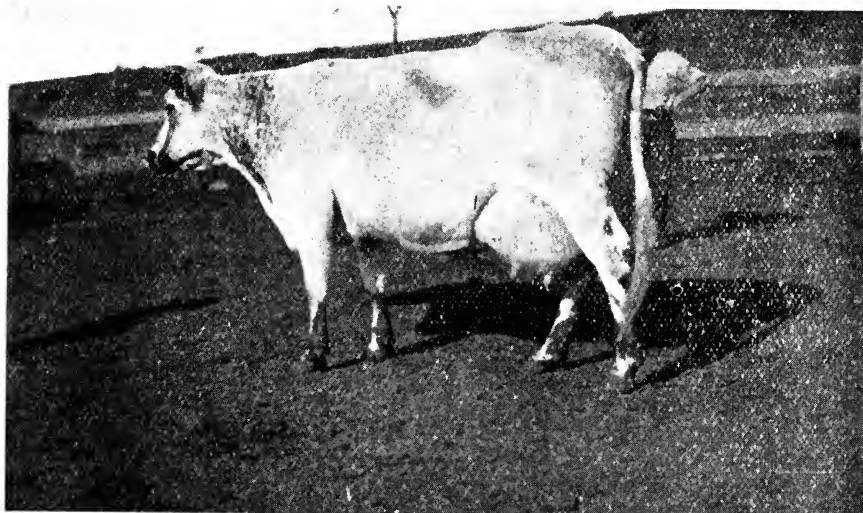
There are, in my opinion, in these various principles many things which are equally fundamental, because they serve as foundations in both the common and scientific order of breeding, and because it is impossible to assign to any one of them an exclusive privilege. It is a prejudice and fatal error to believe ourselves able to prove everything connected with cattle breeding by the use of reason; the principles on which reason is founded are prior to its use; the existence of reason, and that of being that reasons, are prior to both.

Taking, then, the systems of breeding cattle as explained in this article, it will be necessary for the student to grasp the life history of some of our best strains of dairy cattle and observe closely which system gives the best results. Mr. Henry Osborne worked out his plans of breeding by using the best Longhorned Durham, Longhorn,

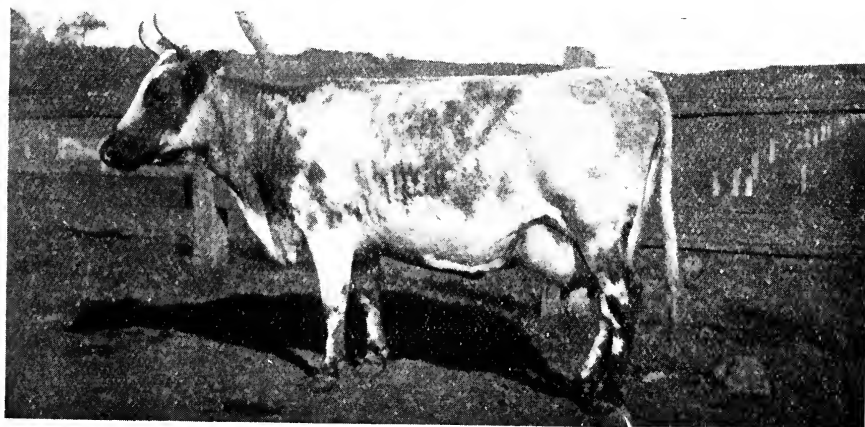
ON BREEDING DAIRY CATTLE.



Blossom, Roan and White, 6 years old.



Queen II., Light Roan, 10 years old.



Model, Light Roan and White, 7 years old.
Bred by and the property of Mr. E. J. Marks, Terragong, Jamberoo,
New South Wales.
(For further particulars see Appendix.)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

and Red Lincoln bulls on cows that had been bred from Longhorned, Durham, Ayrshire, and Longhorn crosses. Mr. Duncan Beatson followed on practically the same lines, also Mr. Andrew McGill and Mr. Evan Evans. Lomax used the Durham and Lincoln breeds, and was followed by Messrs. George Brown and Andrew Thompson, both of whom used Lomax bulls on crossbred Longhorn cows. It might be inferred that the Durham, Longhorn, and Lincoln bulls gave the outward appearance to those celebrated herds only, whilst much of the constitution and the nervous system or dairy system was provided by the Ayrshire and Longhorn crosses that existed in most of the dairy cows. But it must be remembered that the Ayrshire bulls of great quality, which were plentiful in those days, and largely used with the Durham and Lincoln cows, and which were productive of much good, were very different from those of the present day. ever, their usefulness was largely increased afterwards for the better when their progeny was mated with Longhorned Durham bulls. We have also at present a few such examples. We have also excellent results from Jersey bulls or Ayrshire cows.

We may try to theorise on the origin of our Illawarra breed of cattle, and dispute one with another with respect to their true origin, and those who know the least will, generally speaking, say most, and conclude with the often repeated remarks, "They are nothing but a cross between an Ayrshire and a Shorthorn." But such men never saw the South Coast herds in the latter end of the forties and the beginning of the fifties, and, what is worse still, they never had many opportunities of chatting by the fireside with those who did. During those years three-fourths of the dairy herds of Illawarra were composed of either Wentworth's or John Terry-Hughes' Longhorn and Durham crosses. There were far and away more Longhorns than any other breed in Illawarra. Mr. Henry Badgery, of Vine Lodge, Bong Bong, and his neighbours Edward and William Shipley were largely stocked with these Longhorned-Durham cattle, and they were scattered from Bong Bong to Twofold Bay. These Longhorns were an ideal general purpose cow. They could rear a calf better than any other breed, and give two buckets of milk every morning for cheese making. We have the authority of Mr. John Russell, of Croome, that at the commencement of their cattle breeding experiments, both Andrew McGill and Duncan Beatson had herds composed of three-quarter bred Longhorns—"Ballies" the old settlers used to call them, perhaps without the slightest knowledge of their origin.

The weight of evidence goes to support the view that the dam has much more influence on progeny than most breeders are aware, because the history and pedigrees of herds have been carefully compiled only on the bull line, which is a mistake.

The dam, whilst dividing influence with the male at conception, has the foetus almost completely under her control until the birth of the calf. The air the dam breathed, the food she ate, are quite independent of the male during the whole period of gestation. The first male having fruitful intercourse will influence subsequent offspring. The writer is an advocate of always breeding from the best animals of both sex, and, however conflicting our experience, one's reason dictates most emphatically that every dairyman should do his utmost to obtain the best sire. Which is the best sire? Surely the animal that produces the best cattle for our special purpose! Most authorities adhere to the principle of always using a purebred sire in their herd. We have, however, observed some very remarkable instances of the excellence of somewhat crossbred sires. For instance, Mr. Faulk's bull, bred by Mr. Evan Evans, of Penrose, Dapto, and reared on the tableland south of Goulburn until about four years of age, although probably purebred, was, however, a patchy red roan in color, small in size, yet big-bodied in comparison, possessing small bone, a vigorous eater not inclined to put on fat, of very sound constitution. This bull

ON BREEDING DAIRY CATTLE.

was mated by Mr. Faulk with a remarkable red cow which he purchased at Sutton Forest. This cow was red in color throughout, good on top, large, well-shaped udder—equal to 60lb. of milk per day—and resembled the Red Lincoln, a breed produced by mating the Devon and Shorthorn breeds. The result of the cross was a red bull calf called "Sojer Boy," reared on his Yellow Rock farm, and sold to Mr. Snell, who lived more to the southward on the same range. According to Mr. Hugh Dudgeon, who about 1881 purchased Sojer Boy, no better bull was ever bred. From Sojer Boy's stock he produced the best herd of dairy cows on the South Coast between 1883 and 1888, Sojer Boy resembled his dam in color, formation of back, loin and thigh, and the heifers sired by him possessed, like their granddam, well-developed udders, and were all heavy milk producers, showing plainly the granddam's influence. We have undoubtedly in the dam of Sojer Boy either a Red Lincoln or a cry-back to the old breed. A famous bull was Boxer, in color a dark-red on body, with very dark-red forequarters. He had a dark-colored muzzle and a white flank and belly. Spinks Bros. mated Boxer with one of the finest cows ever bred by Mr. Henry Fredricks. She was by a Baronet bull out of a cow bred by Mr. William Gordon, of Summer Hill, Kiama. The result was a light roan bull calf called Musket. Musket grew up into a very fine bull. Although not appearing to carry much condition, like his sire, he was very strong constitutionally. Musket seems to have "nicked" exactly with the Spinks herds as the sequel will show. At one time in Kiama four yearling bulls exhibited by Spinks Bros. were awarded first, second, third, and highly commended for fourth prize in a ring of upwards of twenty young bulls. Yet the influence of the dam of Boxer, bred as she was from stock raised direct in line from the late Mr. James Robb's black and white Ayrshire bull, could be traced in that excellent strain for generations afterwards, inasmuch as the brown or black shades could be traced in either the so-called roan or red Shorthorns, no matter how the sires and dams were mated in order to produce clean colors.

Another instance were the Boyd cattle. Who could look at Mr. Dan Boyd's herd in 1886 without thinking of the cattle exhibited by the McGills in the sixties and seventies, or Messrs. Joseph Dunster, and William James of the seventies and eighties. There is yet another example of the wonderful influence of a single animal in a whole district, that of the celebrated purebred Ayrshire bull Earl Beaconsfield. Earl Beaconsfield was placed by Mr. Lindsay in his herd for the purpose of altering the type and constitution, and the result was highly satisfactory. Earl Beaconsfield was a brown-red and white color, with a very fine eye, a low-set, well-shaped body enveloped in a skin as pliable and perfect as possible. In Mr. John Lindsay's herd at Kembla Park, Dapto, he is said to have sired Honeycomb and Whiteback, two of the most remarkable cows raised in Illawarra, Honeycomb being evidently a cryback to the type of cows seen many years previous in Mr. Andrew McGill's herd, and Whiteback was by the same token a cryback to the types of cows in Mr. Duncan Beatson's herd at the time McGill made his first purchase. In the herd of Mr. John Grey, of Berry, Earl Beaconsfield also proved himself a remarkable sire, and the young bulls, although by no means purebred, were freely bought by farmers and mated with cows of all breeds and shades of color, without ever disgracing the milking qualities or constitutional vigor of the Beaconsfields, as they were generally termed. Similarly the imported Red Lincoln "Governor" gave his name to characteristic progeny known as the Governors many years previous to the introduction of the Major blood.

But it must not be forgotten that during all those years between 1830 and 1850 there were a very large percentage of Macarthur's Longhorns among the dairy stock of Illawarra. As a writer says:—

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

"They were of the improved Craven or new type of Leicester breed, and amounted to many hundreds, and for regularity and size and general contour were immeasurably superior to any similar number of cattle to be seen in any part of the world. Johnny Ritchie, that prince of bush riders, was often seen busy with Billy Broughton and others collecting them, or those of them that carried the DW—Wentworth's brand. That these Longhorns, on the testimony of the old hands, who used to milk their strawberry, yellow, and brindled ballies, no better cattle ever entered Australia. The dairy men neglected the breed in their first attempt to follow fashionable breeding in New South Wales.

After the description just given of the several Durham and Ayrshire bulls that were so successfully mated with the Ayrshire and Durham, and even crossbred cows to be found in Illawarra, it may be inferred, by the novice breeder that all any man or woman had to do was to obtain Ayrshires and Durhams and mate them by either using Durham bulls on Ayrshire cows, or vice versa, to get good results. But the "cocksure" man (in the absence of the Longhorned Durhams of the past) finds out to his sorrow sooner or later that he has to contend against Nature's difficulties. Those who have had opportunities of observing the present type of Shorthorn and Ayrshire very close must often have been struck with the vagaries they cast from time to time in the form of calves. The Shorthorn especially closely must often have been struck with the vagaries they cast from time to time in the form of calves. The Shorthorn especially when two rich roans are mated, is very liable to throw calves snow white, with red or black ears and a black muzzle. Take, for example, Royal Windsor, bred by and the property of Mr. E. B. Woodhouse, of Mount Gilead, Campbelltown. No purer bred Shorthorn could be found, yet he was snow white with jet black ears, horn tips, muzzle, and hoofs. Turn to Landseer's picture of the semi-wild cattle of England and Scotland, and compare them with modern photos of our Ayrshire, and we see a most striking resemblance. Then, again, take the Scotch Kyloe, with its ear marks, and we find those marks repeated to this day, together with the dollar spots. These marks can be found also in the most carefully bred modern Shorthorn. And these colors and markings are not new to the breeds, as we find that some of the best bulls bred in Australia for the past sixty-five years, whether Durham or Ayrshire, had the same tendency to revert to their ancient ancestors. This "atavism" is, in the writer's opinion, fatal in the majority of cases to the axiom that "like produces like." Nature hates extremes, and it is therefore only natural for some types of the Ayrshire and Durham breeds of cattle to blend together better than others. This law can be observed and followed with profit in connection with the crossing of breeds generally.

After having passed judgment on the several bulls which played such important parts in the formation of our dairy herds, we will glance at the performances and breeding of a few cows that have been raised from those bulls. It must not, however, be inferred from what follows that this or that bull or cow, whether Ayrshire or Shorthorn, or Jersey and Ayrshire being good, all such crosses are good. Far from it. It has been proven over and over again that in order to get good results from either an Ayrshire-Shorthorn cross, or a Jersey-Ayrshire cross, the blood of one or the other must predominate, and, further, the blood of both sire and dam must be extremely good quality. When we talk of a Shorthorn-Ayrshire cross, or vice versa, or of any other cross or blend, we mean a cross of blood between sires and dams of good milking strains. For example, Theodore (30,145, C.H.B.) was not bred for dairy purposes, nor was he imported by Mr. R. L. Jenkins, of Nepean Towers, to mate with anything but cattle raised for beef purposes. Yet sons of that famous bull proved good sires for both milk and beef. The Theodores bred

ON BREEDING DAIRY CATTLE.

by Dr. Jenkins were not all successful on the beef-raising stations owing to their tendency to produce cows that gave too much milk. If these cows had been mated with an Ayrshire bull like Earl Beaconsfield we might have expected good results. But it is the old story, "First catch your hare!" Even supposing two similar animals to Theodore and Earl Beaconsfield were obtainable, how many judges could pick them out of the hosts of animals of the same breeds in this country to-day? How many could be found to agree as to how they should be used in order to get the best results? These are pertinent questions which draw forth the opinions of all the dairy stock breeders of our day. The same questions arise with Jersey-Ayrshire crosses. Here we have an example in the theory so successfully followed by Mr. David Hyam, of Nowra, Shoalhaven. He used a purebred Jersey bull on an Ayrshire cow. This Ayrshire cow came direct in descent from Mr. James Robb's imported black and white bull, having been brought into the Berry district by a Mr. Navin, who lived on Mr. Robb's Riversdale Estate, Kiama, for years. The result was Blossom I. She was a fine cow, and Mr. David Hyam mated her with a purebred Jersey bull, and the produce was Blossom II., which he in due time tested for the prizes offered by the R.A. Society, Sydney. The writer tested the cows entered for those prizes, and is, therefore, certain of the genuine producing quality of the cow, which may be described as a dark brown and white Ayrshire-Jersey cross. Blossom II. won her first butter test prize at Wollongong in 1895, making 2lb. of butter from 19lb. of milk, at the age of $3\frac{1}{2}$ years. She won the butter test at the Berry show, making at the rate of 27lb of butter per week in 1896. In 1901 she won the Royal Champion and "Sydney Mail" prize. Blossom II. was mated by Mr. Hyam with a pure bred Jersey bull, and the result was Blossom III., which may be described as a seven-eighths bred Jersey. Blossom III. was a better performer than her dam. She gained the Royal Champion and "Sydney Mail" prizes in 1906, with a three days' test of 8 $\frac{1}{2}$ lb of butter. The sire of Blossom I. was a pure bred Jersey bull, owned by Mr. Solomon Hyam, of Sydney. Blossom II. was by the pure bred Jersey bull Berry. Blossom III was by Gipsy King. Gipsy King's pedigree is to be found in Vol. I., A.J.H.B.

It will be seen by the above system of breeding heavy butter producing cows that Blossom I, dam was from a noted strain of Ayrshires, and Mr. Hyam used pure Jersey bulls on this strain. But we have an example in Spinks Bros.' cow tested according to the pan setting and churn system, from December 2 till 9, 1886, in Kiama. For the week she gave 312lbs of milk, which produced 14lb 10oz butter. The dam of this cow was bred by Mr. John King, of Long Brush, Kiama, and her sire was a three-quarter-bred Jersey bull, owned by Mr. William King, of Kiama. Mr. John King's herd was made up from cows of great quality, purchased at fancy prices from Mr. Henry Osborne and Mr. Andrew McGill. Spinks Bros.' cow resembled the McGill strain, being dark red with a little white. This cow was mated by Spinks Bros. with Musket, and the bull-calf, the result, was sold to Mr. Thomas Cochrane, of the Richmond River, for £30, a very big price in those days for a bull calf. The cow owned by Mr. William Walmsley, of Long Brush, Kiama, and tested from December 1. till 7, 1879, produced 391lb. of milk, which was manipulated under the old pan setting and churn system, into 18lb 4oz of butter. This cow was bred by Melliday Bros., of the Foxground, Gerringong, whose herd was chiefly composed of Osborne-bred cows. The dam of Mr. Walmsley's cow was certainly of that

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

strain and her sire was bred by Mr. Thomas Brown, of Kiama, from a bull he had purchased from Mr. James Robb, and by the black and white imported Ayrshire bull. The cow owned by Mr. Charles Price, of Jamberoo, and tested October 9 to 15, 1879, was bred by Mr. Moses King, of Jamberoo, and branded K in circle. This cow's breeding is not clearly defined; but she was, doubtless, a mixture of Durham and Ayrshire, through more than one blend of the Osborne and Robb's strains; her production for the week was 359lb of milk, making 18lb 3oz butter. From a practical point of view, it matters not whether Mr. Price's cow was three-quarter Ayrshire or three-quarter Durham, as both strains of blood in her veins were, as we have seen, of excellent dairy quality. Her sire was a half-bred Ayrshire bull, and her dam a three-quarter Durham, and in general appearance she favoured her sire, which goes to show, in her case at least, the sire gave the outward characteristics to his progeny, whilst sire and dam combined to give the quality. Cole Bros.' cow, tested from February 28 till March 6, 1879, produced 420½lb milk in seven days, which produced 18lb 4oz of butter. To arrive at the breeding of this cow we must go back to Mr. Thomas McKenzie's herd at Cambewarra, in 1869. Mr. McKenzie had commenced in the forties with two calves, a Durham bull and an Ayrshire cow. From these two calves he had, in the course of twenty years, built up and sustained a very valuable herd of cows. In 1869 Cole Bros. purchased heifers from Mr. McKenzie, and a young bull, bred by Mr. Tate's bull Boxsell. Boxsell was bred, as stated elsewhere, by Mr. John Boxsell, of Berry. Cole Bros.' cow was bred in this way, and, no doubt, these animals laid the foundation of their herd. The bull purchased by them bred by Mr. Thomas McKenzie, and named The Scotchman, although roan in color, contained the blood of Dr. Alcorn's Ayrshire, and Mr. George Macleay's Ayrshire, Normandy cross, in his veins. His dam being of those strains, and his sire of Mr. Berry's Longhorned Durham strain, which was to be occasionally met with in those days.

CHAPTER IX.

ON THE INTERMINGLING OF BREEDS.

It was the craze with the showmen to possess cattle of fancy colours, that sent the white back, checkered-faced cattle to the slaughter-houses, and the dark-nosed calves to the pig-pots. Of course, there was that cruel jealousy in existence also which caused good young bull-calves to be cut up into food for cats and dogs sooner than allow one's next-door neighbour to get the strain. But the craze for show-ring animals and crossbred test cows was ultimately the means of thinning out to a great extent the old types from which those show animals and test cows sprang. We might, therefore, reasonably ask ourselves is it too late even now to get back again to those old-time dairy animals? How have breeds been founded? It is, in the writer's opinion, the first question which should be put, and we have history to show us that, although Charles Colling's Hubback, the grandsire of Comet, was picked up in a lane in England, and Godolphin Arabian, the maternal grandsire of Eclipse, was purchased from the owner of a water-cart in France, they possessed qualities which at once placed them at the fountain-head of Shorthorn cattle and racehorse breeds respectively. With the racehorse, we are told, that Captain Byerly and a Mr. Darley each introduced into England an Arabian horse which have since been recognised as the Byerly Arabian, and the Darley Arabian. Later on we read of Flying Childers, 1715; the Godolphin Arabian in 1724; and their Waxy, foaled in 1790. Some writers prefer to use the expression Byerly-Turk when referring to Captain Byerly's importation, as that animal was purchased in Turkey. If this, however, means that the English racehorse was originally crossbred, it only goes to prove what can be done in a short space of time with crossbreds when intelligently mated. Horse-breeders say: Breeding for the turf is exceedingly common, and may be shortly stated as follows: First, in-breeding, as the foundation; second, out-crossing from inbred blood; third, returning to the same strain after an outcross; and then several processes naturally follow one another. By in-breeding, is meant a reunion, once, twice, or oftener, of strains of the same blood, separated, as a rule, by not more than four steps of generations; but there are cases in which greater distances have proved successful.

So convinced was an old turf writer on the origin of the English racehorse being produced in the manner named, that he declared that all great racehorses are combination of Herod and Eclipse blood. Another writer, in a later period, stated that all good horses were a mixture of the blood of Waxy, Buzzard, and Orville. Yet we are told that Mr. John Lee, of Bylong, once said: "When buying thoroughbred stock, I do not care how they are bred, so long as they please me." But, of course these statements do not prove that all horses possessing certain strains of blood are good, or that all horses that pleased the best breeder's eyes were good either. Far, far from it. These statements only go to show that the Byerly-Turk, or Arabian, the Darley-Arabian, the Godolphin-Arabian, and the Persian Gulf-Arabian, or Barbs, seem to have eaten up each other until the English racehorse was produced and perfected. It certainly required men with money and brains to bring about this great blend. However, it was done, and our present-day blood horses are the result. The breeding of the dairy cow ought to be on similar lines. In fact, it was originally done by that prince of breeders, Bakewell, who bred the celebrated long-

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

horned bull, Shakespeare. He obtained one of the Westmoreland longhorned bulls and mated him with his own longhorned cow, Old Comely, the result was Comely heifer No. 1, and Comely heifer No. 2. Then he bred by the same bull and cow a bull called Twopenny. Twopenny was then mated with his dam, Old Comely once, and Twopenny and Canley heifer No. 2 twice, the grandsire and the dam of Shakespeare being both by him out of Comely heifer No. 2, and his daughter from his own dam being the dam of Shakespeare's sire; so that the breeding in-and-in was remarkably close.

It is beyond dispute that these cattle were the best dairy cattle ever seen in Australia. When mated with the Shorthorns we get the Strawberry longhorned Durhams that laid the foundation of the celebrated Booth strain of Shorthorns. These strawberry longhorns, which Bakewell perfected, could be seen all over Australia at one time; but their great tendency to throw back or "cry back" to their ancestors, those animals with gallons of milk in their udders did not suit the beef-breeders, and as their colours were condemned by the showmen the breed was soon neglected and forgotten, so far as the station men of Australia were concerned, since the later sixties. Those men who were instrumental in perfecting the English racehorse were thoroughly acquainted with the nature, habits, and characteristics of the Byerly-Turk, the Darley-Arabian, the Godolphin-Arabian, and the Persian Gulf Barbs. They were also acquainted with the fact that there may have been some difference in the blood of the Byerly-Turk from that of the Darley-Arabian. Be that as it may, they understood the distinction that existed between those strains and the Persian Gulf Barbs; and between the latter and the Spanish horse. Bakewell knew the difference between the Westmoreland Longhorned bull and his own breed of Longhorns before he mated that bull with his own cow Old Comely. Bakewell also knew the history of the Longhorns, as well as their nature and characteristics. How different it is when we turn to our own times and read the articles or listen to the speeches of the men who have been trying to perfect an almost extinct race of either horses or cattle. "Not understood" may be aptly applied to-day to either the Arabian horse or the Longhorned breed of cattle. Yet, no animals we are acquainted with, with the exception of the Ayrshire breed of cattle, have proved to be so successful in blending with other breeds of their kind. The Arab horse will blend with any other breed of horse on earth; so would the Longhorned cattle blend well with any other breed of cattle. Both could point to antiquity for their origin, so to speak. There was something inherent in the Arabian horse, and the Longhorn, and Ayrshire cattle that cannot be easily described; yet, no one who has once studied their true characteristics has failed to observe it. Cheap grasslands, wide tracts of unfenced country, careless breeding, have combined to destroy the several breeds of high-class dairy cattle that at one time existed in New South Wales. Whilst people adhered to the old system that prevailed in the twenties and thirties in the counties of Cumberland, Camden, and Argyle, that of keeping the stud animals in secure paddocks near the homestead, the breeding and quality could be relied on. But, in after years, when cattle became cheap, the majority of the breeders neglected their herds and allowed all the breeds to mix together and run wild over the country.

If we take the early forties, we will find that Messrs. Wentworth and John Terry-Hughes had very large herds of what we will term "Macarthur's" Longhorns; their brands were DW and WH. Then we have the "Lomax's" Shorthorns and Lincolns; his brand was

ON THE INTERMINGLING OF BREEDS.

LX. The next we will mention is Henry Osborne cattle, they comprised Shorthorns, Longhorns, Lincoln, and Ayrshires, which he kept separate, and crossed judiciously for practical and sale purposes; his brand was HO. Mr. John Wylie, who owned Dunlop, near Dapto, had a herd of imported Ayrshires, together with some fine animals he purchased from Mr. William Howe, of Glenlee; his brand was JW. Now it would not be exact to even hint that the Illawarra cattle, like the English racehorse, absorbed in time, all those breeds, for such was not the case, as has been clearly demonstrated. But it would be safe to say that the cattle of one or other of those breeders took the fancy of those that followed them, and made up their herds. Therefore, we have Duncan Beatson going in for the Durham blood of the HO, the Longhorned blood of the ITH, and Lincoln blood of the LX brand. There being a great affinity between these breeds in those days, we have it recorded as being a most wonderful herd of dairy cattle. Andrew McGill went in for Beatson's cattle, and produced the Scotch Jock strain, which made the AMG brand famous. Evan Evans went in for the Lomax Red Lincoln bulls, and purchased the best cows obtainable from the smaller dairymen. These animals gave him such good results that he determined on giving up store-keeping, and devoted his attention entirely to dairying and cattle raising pursuits. He, therefore, established the EE brand many years before he purchased the bull Major as a calf in 1862.

There are three other brands of cattle well established in the early forties, namely, Johnston Brothers, who established the spur brand of Shorthorns. Their Illawarra estate known in those days as Johnston's Meadows. There were also Messrs. Towns and Addison, who occupied a great portion of Mr. D'Arcy Wentworth's Peterborough Estate, Shellharbour. Their brand was TXA, and the majority of their cattle carried the DW brand in the earlier stages, owing to Captain Addison being Mr. Wentworth's son-in-law. The Longhorned cows were mated with imported Durham bulls, and the progeny were much admired. Probably the oldest-established dairy herd in Illawarra was that of Mrs. Jemima Jenkins, of Berkley. My informant was Mr. William Davis, of Jamberoo, who arrived at Wollongong with his father at the age of 12 years, in 1822. A native of Sydney, he was very observant, and could describe everything he could see in those days of early Illawarra. "The Jenkins family were," he said, "milking about twenty cows," and most of them had white faces and backs." Mrs. Jenkins's brand was JSJ. This herd was afterwards much improved by Mr. John Robinson, manager for Mrs. Jenkins. In 1835 the herd was considered second to none in Illawarra. Later on Mr. W. Warren Jenkins commenced building up a herd, his brand being WWJ, and Illawarra dairymen saw no more of the JSJ brand. In 1873 this gentleman took up largely the breeding of Shorthorn Durham, and purchased many pedigreed Shorthorns from Messrs. E. K. Cox, Fernhill, Mulgoa, Penrith; Barnes and Smith, Dyraba, Richmond River and Mrs. Clark Irvine, Tomki, Richmond River. But his best purchases were Merry Monarch and Gaylad blood. They were not, however, dairy cattle, nor were they ever intended to be used for dairy purposes. In 1820 Mr. George Tate arrived in Wollongong, from Mr. Oxley's estate at Camden, and established the T in heart brand of cattle. Mr. Tate bred cattle on his Spring Hill property principally for draught purposes and for beef for the young settlement. He sold out to Captain Waldron in 1832, and went to live in Campbelltown, where he apprenticed his sons to trades. At the death of their father the Tate brothers returned to Illawarra and commenced dairying in connection with their

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

callings. Mr. George Tate took up the T in heart brand in 1841, and since then it has been well known among the dairy herds of Illawarra, and in later years in Kangaroo Valley.

Mr. John McCaffrey's cow, tested under adverse weather conditions, gave 289lb of milk, which produced 14lb 4oz of butter. She was bred in a remarkable way. Her dam was bred from a cow that was a half-bred Guernsey and Ayrshire. Her sire was a Durham, and she resembled the dam in every respect. On being mated with a Durham bull her calf also resembled the Guernsey-Ayrshire very much. This goes to show in an unmistakable manner the vagaries a breeder must be prepared to meet when attempting to breed profitable cattle. So long as dairy quality exists in all the animals of the breeds used in these crosses, dairy quality will be preserved, not otherwise. Mr. Roger Murphy's cow, tested from October 13 to 20, 1887, gave milk which produced 17lb 8oz of butter. She was sired by a bull of the Scotch Jock strain, which she resembled very much, her dam being by a bull bred by Mr. James Robb. She was, therefore, a three-quarter bred Ayrshire. During the year 1886 the Kiama A. and H. Society carried out a milking competition. Among the cows tested was one on May 5, bred by Mr. Dan Boyd, of Berry, which gave 58½lb of milk in 24 hours. She was of the Scotch Jock strain, sire and dam. Mr. Robert Miller's cow, tested October 2, 1886, gave 55lb of milk in 24 hours, she was a Shorthorn. Her dam was of the Major strain, and her sire was Coronet, bred by Mr. William Durham. Tambo, Singleton, New South Wales. Mr. James Sharpe's cow, tested December 30, 1886, gave 54½lb of milk per 24 hours. Her dam was bred by Mr. William Colley, of Park Mount, Kiama (who, in those days, had one of the finest herds of Longhorned Durhams to be found, he having purchased the best HO cattle obtainable), and her sire was also bred by Mr. Colley from one of Mr. James Robb's Ayrshire bulls.

If these test cows were examined critically by the average expert, when they were about seven months milking, he would probably exclaim: "Oh! they are a worthless lot of mongrel-bred brutes; practically useless for breeding purposes." Quite so; but these animals were bred for the purpose of producing milk and butter, and for such they were admirably adapted. The practical results obtained from these animals were all that could be desired. But when we look back to find the class of animal that their sires and dams were bred from, that class of dairy animal is missing. No interest was taken in preserving the old strains of dairy cattle until it was too late. Even the progeny of those three noted bulls—Scotch Jock, Major, and Mr. James Robb's Ayrshire bull—were allowed, with few exceptions, to drift out of all recognition during the beef-Shorthorn craze between the years 1875 and 1885. It is just possible that in 1885 sufficient of the old types of cattle, once the glory of the Illawarra dairymen, could have been gathered together and preserved for breeding stud animals as in the past; but wool and beef had so completely claimed the attention of our wealthy breeders that they neglected entirely the raising of stud dairy cattle. The smaller farmers were too busily engaged paying rent, and opening up new country for themselves and their sons elsewhere, to study the science of dairy cattle breeding. Lands that were originally very rich were being starved, and the larger breeds of cattle had to give place to the smaller breeds.

Those dairymen who settled south of the Illawarra Lake, as a rule, began their dairying operations in the forties or fifties, and as they invariably established their dairy herds from stock purchased from the aforementioned breeders, may be placed on record

ON THE INTERMINGLING OF BREEDS.

as being practical dairymen, who made the best possible use of the material at their command. Among these were Mr. Ebenezer Russell, of Croome, who established the ER brand; Mr. Joseph Dunster, the Z over W brand; Mr. George Woods, Jamberoo, the GW brand; Mr. Henry Fredericks, Kiama, the HF brand; Mr. James Spinks, the JSP brand; Mr. William Gordon, GX brand; Mr. Hugh Dudgeon, H D reversed brand; Mr. John Colley, the Cf brand; and Mr. James Graham, of Waughope, Jamberoo, the JG brand. The Messrs. Black and the Misses Black, who had excellent herds of cattle in the fifties and sixties, obtained their stock principally from Mr. Henry Osborne. Mr. John Marks purchased from the Messrs. Macleay, of Ulladulla, and from Mr. Henry Osborne. Mr. John Black's brand was JJB, and Mr. Mark's brand was M in circle. There were other breeders on the Riversdale Estate besides Mr. James Robb, sen., notably the Messrs. William and Joseph Vance, Samuel Forward, and later on Mr. George Wood, Spring Hill, Messrs. Vance and Forward's cattle were of very excellent quality; district. In the immediate vicinity of Kiama there were Mr. John King, who used to breed from the HO brand; and also Messrs. Hugh and William Colley, who bred from the HO brand for many years, generally for their own use. Then there were the Love, Moses, and Elliott families near Mount Pleasant. Mr. William Elliott's brand was WE. Elliott's cattle bred from the HO brand could not be beaten for quality anywhere. Further south the herds were made up more from Messrs. Berry and Wollstonecraft strain of dairy cattle. Mr. John Berry was the man in charge of the Jindyandy herd, and he went in extensively for the Longhorned Durham, which suited the fancy of the dairymen in and around the Shoalhaven Valley.

CHAPTER X.

THE PECULIARITIES OF BREED.

In reviewing what has been written of the sources and progress of our breeds of cattle, we must endeavour to keep in mind that notwithstanding the conflicting testimony of many well-known authorities, we are bound to recognise the "Celtic Shorthorn" (*Bos Longifrons*) as the aboriginal domesticated ox of the British Isles, the only ox possessed by the Romanised Britons; and the only ox of which we have any traces among the remains of man of an earlier period than that of the Saxon invasion. It was a small, dark-colored ox, and is believed to be most truly represented, at the present time, by the cattle of the Highlands, and the western and northern islands of Scotland, of the north and south of Wales, and of the Kerry Mountains, in Ireland.

No doubt, therefore, but what the smaller breeds must be classed with the Longifron group. It is, however, difficult to classify breeds like the Longhorns, Galloways, and Durham Shorthorns (the two latter being complete modern breeds), with the Irish, Welsh, and Scotch breeds, to which we have just referred, and which do not appear to have undergone much, if any, alteration by crossing; but to have retained the original characteristics of their race, subject to such modifications only as climate, pasturage, and the various conditions of life generally would be likely to effect in the course of many centuries. Some of the larger polled breeds appear to be but little removed from the Longifrons type, except in their hornless character, and the alteration of the crown of the head, caused by alteration in both the bone structure and the hair, which accompanies, or immediately follows, the hereditary loss of the horn. On the other hand it is thought that the Aberdeen Angus shows descent from a larger species of ox, and that also traces of a larger ancestor are found in the polled cattle of Norfolk and Suffolk; but exactly how these conclusions are arrived at is not easily defined. Whether all the polled breeds derive that character from one original source alone, or from two or more sources, is a question which does not affect the present distinctness of any one of them, and may, therefore, be left in the hands of naturalists for further investigation and enlightenment.

We have the undisputed testimony of science and practical experience to show that it is quite possible and, time granted, not difficult to transfer the peculiarity of one breed, or of one individual to millions of individuals of various breeds without disturbing the constancy of transmission of the distinguished properties of these breeds further than in a single alteration. It was in this way many of the combinations of peculiarities in breeds have been produced. For instance, it has been found possible to unite in one breed of poultry, topknot, whiskers, and beard, ten toes, feathered legs, and vulture hocks. These, perhaps, all excesses which would be more wisely avoided than sought. But so long as wayward fancy is a ruling power, there is no saying to what length absurdities may go. In some of our more useful breeds of live-stock, more notably poultry—which are easy victims to depravity of taste—we have to tolerate positive deformities, characteristics that are not only ugly and useless, but absolutely bad which have been imposed in wanton phantasy. Now they cannot be disassociated from the breeds without loss of time and risk of loss of absolute merit, by the system of crossing which would be necessary, especially where

THE PECULIARITIES OF BREED.

deformities have been cultivated designedly, and made to grow up side by side with the good properties, until the task of parting the bad from the good has become too great for any ordinary breeder to attempt.

We may seriously ask whether the element of fancy is not too strong in the judgment of some breeders of our most important kinds of dairy cattle; whether it does not sometimes induce breeders, either from individual preference, or more commonly, as followers of fashion, to reject some of their best animals for non-conformity with the demands of fancy or fashion, and to retain inferior animals for their conformity to those demands. It is one thing to recognise distinctive marks of breed, another to narrow the range of variation so as to impose injurious restrictions upon the liberty of breeders in their selections and matings of their stock. In this respect the polled character of some of our breeds of cattle, must not be classed among the deformities effected to please the caprice of fancy, as it has in some circumstances the recommendation of valuable advantage. When cattle have to travel much, especially by rail, or driven in large numbers, they are obviously in less risk of painful and damaging accident if they have no horns among them. On the other hand, horn is a useful article of commerce and manufacture, and as there are markets in which it is demanded, so, no doubt, there are countries in which horn-growing cattle will not be given up in favour of the polled breeds. Apart from its commercial value, a beautiful horn is one of the chief ornaments of a dairy cow, besides, it indicates much in her breeding.

To revert to the origin of cattle once more: It is not definitely known from whence the Jersey Breed sprung. They certainly were not imported from Britany, where the cattle are mostly black and white. Probably they came from Normandy, before the days of King John. As an eminent writer puts it: "An Englishman accustomed to look upon the Channel Islands as dependencies, is somewhat staggered when he first hears from a 'Jersey-man' that the relationship ought to be the other way about; for it was not England that conquered the Channel Islands, but the Channel Islands that conquered England. At the conquest they were part of Normandy, and as Normans their Barons took their levies to form part of Duke William's army. When John lost Normandy, the islands remained true to the British Crown. John, the great charter-giver, under compulsion, went over there in a hurry, and as he had made things pleasant at Runnymede, so did he there. He gave us a charter; he gave the islands a greater charter: 'The palladium of Channel Island liberty, etc.,' as per the history book. That charter is still the basis of their liberties. Since then the Channel Islands have been the most anti-French subjects of the Crown, even now no Frenchman can hold land in Jersey under any circumstances whatever, and as to cattle being admitted from the French coast, why, not only would the cattle be slaughtered as they landed, but the very ships would be seized, and their captains fined £200 each. There is no reason assigned for this extraordinary outbreak of hatred by the people of the channel against the French, as a nation. Certainly, it was not on account of their cattle, as the mainland of France was then very rich in cattle."

As it has just been suggested that probably the "Jersey" is of Norman origin, it may not be out of place to give a description of that highly important breed of cattle. The Norman is one of the oldest existing races of domesticated cattle, yet very little is known of its great milking qualities outside its native heath. The leading characteristics of Norman cattle are: Great size of body, with medium-sized bone, long head, fine horns, usually bent downwards and

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

then upwards and inwards, broad hips, short legs, loose skin, covered with a coat of fine hair of a variety of shades, including red, white, roan, and reddish brown in spots, and brindled streaks. The cow has well-developed milk-veins, and large, well-developed udder. It is claimed by Norman authorities that they are the best dairy cattle in the world, and they unquestionably hold the leading position among French breeds. Their position in France is similar to that of the Yorkshire Shorthorn in the London dairies fifty or sixty years ago. Originally the Normandy cattle were undersized, mere butter-making machines; but of late years they have been developed into general-purpose animals, and their beef equally valued with their milk and butter. This general purpose quality has become of great importance to small proprietors in France, as it enables them to turn to profitable account their cast-off cows and surplus males. They are heavy eaters, and require an abundance of nutritious food. The strongest claim to public favour made on behalf of this breed is on the ground of its hardiness and freedom from all tuberculosis taints. There are throughout the dairying centres of France several other breeds which, by their small size, fineness of bone, and colour, carry about with them evidence of their descent from the *Bos Longifrons*. Between some of these breeds, and the cattle of the Channel Islands there is a sufficiently close similarity, according to the best authorities, to make their kinship a matter of certainty. There is every evidence to show, at any rate for our purpose, that there were large and small breeds on the French coast prior to the days of King John. These smaller breeds would, undoubtedly, be selected as the most suitable for the Channel Islands.

As with the merino breed of sheep, so it was with the Longhorned breed of cattle. The merino had been bred for centuries in the North of Spain. Thence the sheep were taken to Saxony, and there called the "Saxon Merino." When Mr. William E. Riley, of Raby, Liverpool, New South Wales, commenced sheep breeding he imported these sheep from Saxony, and their progeny he called the "Saxon-Raby" sheep. In any of the old prints can be seen an advertisement stating that at this or that sale would be offered a number of Mr. Riley's "Saxon-Raby" sheep, or pure bred rams. The Longhorns existed as a breed in Ireland for centuries. In time they were carried into England. They had been long noted for vigorous constitution and great milking habits. They soon became very plentiful in Leicestershire, Lancashire, and other counties. This breed had been in possession of the Bakewell family at Dishley for a very long period, certainly, long before Mr. Robert Bakewell was born. Of that family, however, very little is known, beyond this, that Robert was born in 1725, on the farm that his father and grandfather had been tenants.

In 1755 Robert began breeding and perfecting these Longhorns for sale. Subsequently the breed was named the "Craven" or "New Leicester." It was under the latter name that Youatt attempts to describe them in his work on cattle. This same breed of cattle Mr. Bates used in perfecting the Teeswater Durhams, which were the Longhorned Durhams of 1800. From the Longhorned Durham was bred the Shorthorn Durham of 1850.

It was, however, under the name of Longhorns, Craven or Leicester, or Lancashire breed that Messrs. John Macarthur, John Terry Hughes, W. C. Wentworth, and others knew and bred the Bakewell cattle in New South Wales. But when we come to draw any distinction between the direct offshoot of this breed, to wit, the Longhorned Durham and the Shorthorn Durham, there is much dispute and difficulty among the various sections of breeders. If we watch the growth of horn on animals allowed to run semi-wild for a few

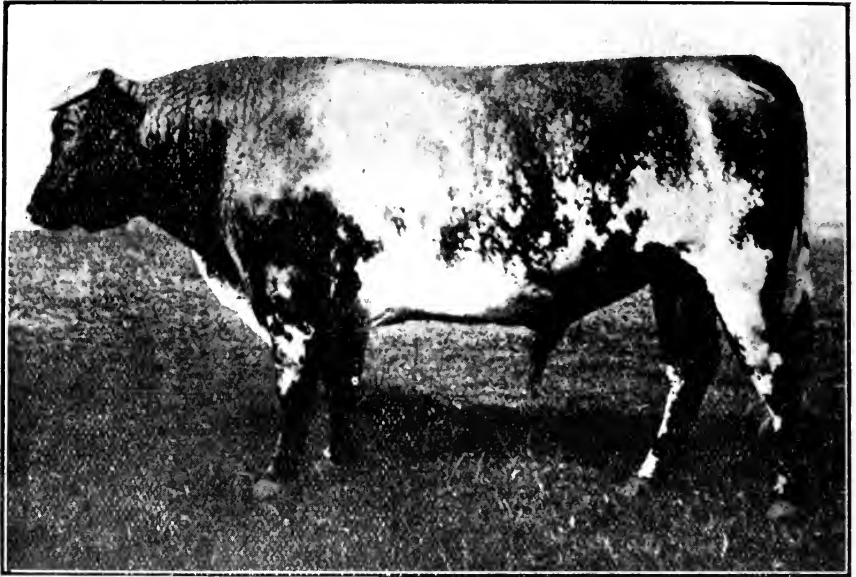
THE PECULIARITIES OF BREED.

generations, we find their horns grow considerably in that space. The horn of those animals, on the other hand, that are housed and pampered for a few generations, grow smaller and smaller. This experience alone teaches us much in forming our opinions when we come to discuss the difference between the Longhorn, the Teeswater, and the Shorthorn Durham. But it is in the milk and butter production of these several animals that we can, with greater certainty, mark the distinction. The Longhorns were essentially dairy cattle, which those who milked them in Illawarra sixty or seventy years ago, have testified to over and over again. The Longhorned Durham as used by Mr. Charles Throsby, Henry Osborne, and others of their school, were more of a general-purpose animal. They were of a strawberry colour, and inclined to have a blazed face. They were also very excellent dairy cattle, as many persons now living can prove. The Shorthorned Durham bred by Collings and Booth were bred essentially for beef purposes, and only those individuals animals of the breed that cry-back to their immediate ancestors the Longhorned Durham, have ever been worth their keep for dairy use. But both the Durham strains, long and shorthorned, owe their dairy properties to the old longhorned type of cattle on which Bakewell, of Dishley, built his reputation.

The Red Lincolns owe their great characteristics to the North Devon breed of cattle, which, in common with the old Teeswater, cattle were remarkable dairy cattle, and gave very rich milk. The leading characteristics of the North Devon breed were such as qualified them for many uses, especially as a cross with the improved Teeswater Durham which, in some instances, were much given to casting white calves. The blend answered admirably, and the result was a new breed, which was called the Red Lincoln. They were red in colour, with long hooped yellow horns. In contour they resembled the Longhorned Durham, and were very excellent dairy cattle, a characteristic they inherited to a great extent from Bakewell's Longhorns. There was yet another breed of cattle in England which must be considered also, as being an offshoot of Bakewell's Longhorns, namely, the Holderness breed. They were practically the same type as the Longhorned Durham, a breed which they resembled in every respect, except colour. The Holderness was dark brown or brindle on the sides, white on the back, face, and belly. They were also very excellent dairy cattle, as was the Welsh Pembroke breed, which they were like in many points.

These breeds all derived their dairy quality, as has been stated. There is no doubt whatever that the chief dairy quality of the old Illawarra cattle was laid by Bakewell's Longhorns imported in the first instance by breeders just mentioned. When the writer's father went to the Kangaroo Valley, in 1846, to commence dairying for Mr. Henry Osborne, three-fourths of the herd, comprising something like 200 head, were composed of Durhams and the Longhorned breed. When Mr. Duncan Beatson commenced dairying operations at Terry's Meadows for Mr. John Terry-Hughes, three-fourths of that herd were of the Longhorned breed. When Mr. Andrew McGill commenced dairying at Hopping Joe's Meadow on his own account, three-fourths of his herd were of the Longhorned breed. These animals were essentially dairy cattle. Every cow would give six gallons of rich milk per day, and milk for ten months in the year without hand-feed of any kind. These cows, with Henry Osborne's English imported Longhorned Durham Duke, were the true origin of the Illawarra dairy cattle, that could not be surpassed in any part of the world for dairy purposes. They were to be found ten months in every year in the stock yard of every clearing lease man and settler between the mountains and the sea, from

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.



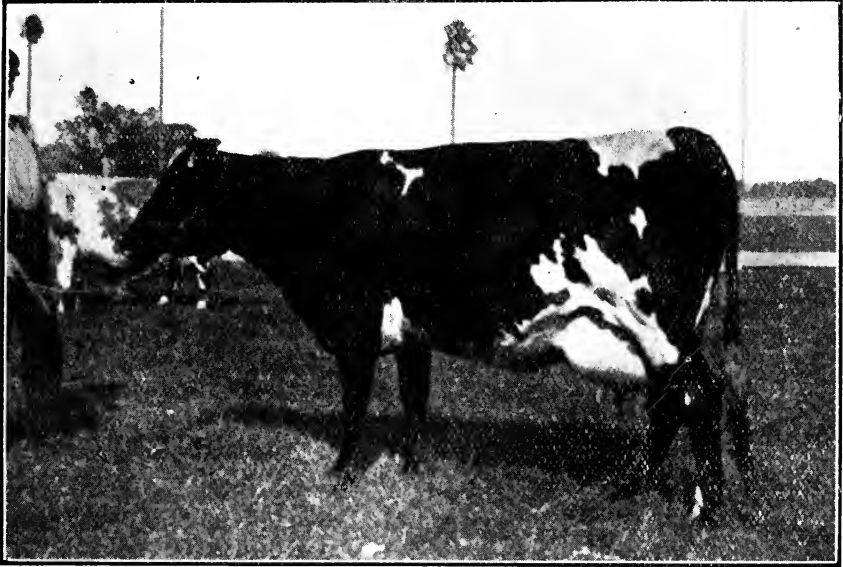
Bull, Barney II. of Nethervale.. Color, Dark Roan and White.
Bred by Mr. James Sharpe, Gerringong, New South Wales.
The Property of Mr. J. M. Miller, Alyne Bank, Gerringong, N.S.W.



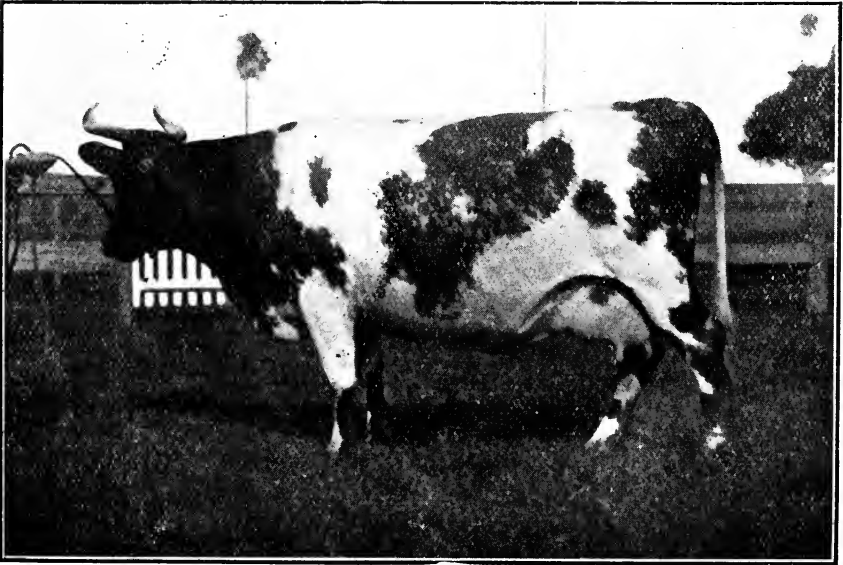
Bull, Barney II. of Alyne Bank. Color, Dark Roan and White.
Bred by Mr. James Sharpe, Gerringong, New South Wales.
The Property of Mr. John Love, Nethervale, Kiama.

(For further particulars see Appendix)

THE PECULIARITIES OF BREED.



Cow, Snaily. Color, Red and White.
Bred by and the Property of Mr. J. M. Miller, Alyne Bank,
Gerringong



Cow, Model. Color, Spotted Roan and White.
Bred by and the Property of Mr. J. M. Miller, Alyne Bank,
Gerringong

(For further particulars see Appendix)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Fairy Meadow, on the north of Wollongong, to Gerringong, south of Kiama, from 1845, to 1865.

Between 1865 and 1875 many changes took place. The Longhorns and the Longhorned Durham were foolishly neglected, whilst the Beef Shorthorns were put, in most instances, in their places. There was a great craze on for the long faced Shorthorn, the fore-runners of the "pig-jawed" cattle. It was in 1876 that the "pig-jaw" cattle conference was held in Kiama, when many people were foolish enough to think it was caused by the cattle having to feed up and down the beautiful slopes that go to make up the rich pasture lands of Illawarra. Then we find the Ayrshire coming to the fore. The bull Major and other such sires filled the bill of fare for the next decade among the dairymen, to wit, that period from 1875 to 1885; but this was largely due to the three strains that existed prior to 1875, and a few really good Ayrshire bulls that were introduced contemporary with Major. The Messrs. McGill steered a very clear course for years after the first introduction of the beef Shorthorn into Illawarra, and those who held fast to the McGill strain afterwards reaped their reward. Hence we have to constantly note the influence of their famous Scotch Jock strain in many of the test cows between 1879 and 1889. The influence of Mr. James Robb's black and white Ayrshire bull is also very prominent in the breeding of test cows under review. But it does not prove anything beyond this: If you want to breed cross-bred cows for dairying purposes, be sure that all the crosses introduced are of real genuine dairy quality. No greater truth could be preached than: A cross between a Shorthorn and an Ayrshire is one of the best for dairy purposes. This is also a very dangerous statement to make, as it has led to much confusion. If the Shorthorn and the Ayrshire are not both of very excellent dairy strains, which are by no means easy to obtain now-a-days, nothing but confusion and disaster can possibly follow. Therefore, for any man to say that the old Illawarra breed of cattle can be replaced by breeding from pure bred Shorthorns and Ayrshires, would be a statement without any knowledge of the foundation of the old strains of dairy cattle, once the pride of our fathers. True, we have seen some specimens of roans or red coloured dairy cattle at our shows of late years, but they are merely the result of some bull that has been cried back by his mother to the old Teeswater Durham from which her progenitors sprung, or probably to the old Red Lincoln which had a similar origin. Further, showmen have a better system of bringing out their cattle now than they formerly had.

In the past we saw the whole herd grazing in one paddock in their natural condition. Yet it was not an uncommon thing to see many of them milked thrice daily, and often for weeks before calving, or until they did calve. Now we are accustomed to see a few head of show animals kept in a fancy paddock, and constantly hand-fed. This statement is made with full knowledge of the fact that at the period under review very few indeed of the dairymen of New South Wales were aiming at the establishment of any defined breed. They were aware that no breed of animal could be transferred from the place where it originated, and to which it was suited, to another of unlike formation, climate, and fertility, and yet retain all its original characteristics. They were also aware that the pronounced milking habit of some breeds was the result of the origination of their nervous system as indicated in the character of the head and spine formation. Further, they worked on the theory that the word "breed" meant as much the purpose for which an animal was bred as anything else. Therefore, in crossing, they did not attempt to mate an animal bred exclusively for beef with another animal bred essentially for the dairy, unless the beef-bred

THE PECULIARITIES OF BREED.

animal had by accident, or otherwise, lost its beef-producing characteristics regardless of the colour of their hair or the peculiar twist of their horns. The belief was that "from unions based upon this principle," whether in the breeding of cattle or horses, "the selection being guided by a skilful judgment and a discriminating tact, we may expect progeny possessing not only a fitting and symmetrical development of the locomotive system, but also an amount and intensity of nervous energy and power unattainable by any other methods. Thus, with the antagonistic doctrine held by the rival advocates of crossing and pure breeding, the dairy world has gained much knowledge since the introduction of the pedigreed Shorthorns and Devons in the dairyherds of the coast and tableland districts of New South Wales.

The writer saw much of the pure bred Shorthorns and Devons introduced in the late seventies, and, with few exceptions, they did not appear to have been selected by dairymen possessed of knowledge of any special system or method of breeding, and, judging by the results obtained by most of those who did profess to have such knowledge, they must have met with many disappointments. Of course, the public heard little or nothing of these disappointments, whilst the successes, however few, were proclaimed daily from the house-top.

CHAPTER XI.

THE BATTLE OF THE BREEDS.

From 1880-1890 there were many changes of opinion with regard to the methods of breeding dairy cattle. It was during this decade that the "Battle of the Breeds" was commenced in real earnest, and dairymen of different schools began comparing notes. The factory system of dairying was being introduced, and A's cheque for milk supplied was being compared with B's cheque, and the number of cows milked daily by each supplier was carefully recorded by neighbours, and posted on the wall on market day. If a large cheque was recorded, it is fairly certain that the cream-meter and lactometer (the only system then in use for testing milk) were carefully read each morning during the following month. That battle has not yet been decided, and the returns and records are still constantly compiled. The chief mistake was that whilst records are kept of the yields of individual cows, their pedigrees were not placed on record with any care. Had a committee been appointed to investigate this matter much education would have been gained therefrom to-day, and, further, much of the talk that has since been common about certain cows having as many as seven calves in one year would have been prevented. Another mistake was made by many owners in mating test cows, as no allowance was made for the law of compensation. Over production in one generation often means under production in the next. Hence we find that the progeny of many of the test cows were very moderate producers, although the dam had been mated with what was considered a good sire. Though like produces like, in a natural or normal state, it does not follow that such is the case where high standard of excellence is aimed at, as was the case with our herd book tests. The dairyman who moved along in the even tenor of his way, reaching fair averages, was more successful in the end.

In drawing comparisons between the cattle productions of one farmer and another, we must note whether the products of the cattle go to a market where the ruling prices will permit their owners to use foods of a high standard of quality or not. In days gone by, in Australia no hand-feeding was employed, the dairy cows gathered their own food in the paddocks adjacent to the homestead, and housing cattle was never heard of outside a few fancy breeders. Cows that were sent along to be tested were placed in a good grass paddock and their milk set in pans, and the cream skimmed and churned into butter, and at the week's end the actual amount of butter was recorded. Returns obtained in this way were reliable, being, as it were according to everyday conditions. Later on when cows began to be tested for a prize or for herd-book conditions, the Babcock tester was introduced, one day being considered sufficient for 12 months. Never afterward was the same interest taken in the results by the general public.

As an eminent authority puts it: "Life must be infinitely diversified in order to carry out Nature's benign and universal policy." That is to say, if all that lives loved the same kind of food, crowded into one local habitation, preferred the same everything, but few comparatively, could enjoy the blessings of existence. Instead, we find that mankind having migrated to various localities carried with them animals of various genera and species, fenced in their holdings, and fed these animals on the grasses and herbage peculiar to

THE BATTLE OF THE BREEDS.

the soil and climate where they made their homes. In these migrations, although there may appear to be a constant tendency to variation in animals, thus subject to the control of man and environment, yet there is a Law which expresses itself as firmly as the life it establishes, viz.: "Each after its own kind." The various races of men and animals furnish us with illustrations. And do not all cross-breeds show by these and other signs exactly in what proportion the blood of each race flows in their veins? Even each sex has its own specialities. The blood itself is sexed; female blood being always contra-distinguishable from male by its containing a greater amount of albumen. A study of the habits of any of the animals of the domestic species will show the correctness of this philosophy of sex.

Some say sires, other dams, impress offspring the more; but a long and large observation of facts bearing directly upon this point proves that while some animals are almost wholly their sires, others are their dams. Yet in the great average they usually resemble each sex about equally. As has been shown, however, elsewhere, males more frequently impart the form, bones, muscles, and strength; whilst the dam influences the nervous temperament and dairy quality, either directly or indirectly. These laws, however, do not work out accurately, and in some few cases we see important animals in no way resembling their immediate ancestors; yet whose progeny in turn throw true to type. This was the case with the last bull sired by old Major. Mr. Robert Hindmarsh mated the bull for the last time with a young red heifer, whose sire was Coronet, and sent her afterwards to his station at Jindin, in the Braidwood district. She in due course calved a patchy or spotted roan bull calf, which she was allowed to suckle. When about twelve months old this calf was struck with lightning, and had one of its sides burnt. He recovered, and was sold to a dairyman at Albion park, who in turn sold him to Captain Thomas Honey, of Kiama. He afterwards became the property of Mr. William Winley, Longbrush, Kiama, about the year 1886, and was very much "dollar marked," like his sire.

We have yet another instance, out of many, to prove the peculiar taint in Major's blood. York Brothers, of Mount Pleasant, Kiama, had a Major bull bred practically on the same lines as Winley's bull, who was, although roan in color, "dollar marked" from neck to rump in a most remarkable manner. He was a very excellent animal, and in appearance resembled the Ayrshire-Durham type, but his progeny in turn resembled the Durham in color and type, which they probably inherited from their grand-dam. We have the same indication of a "cry-back" to ancestors to those two celebrated cows Whiteback and Honeycomb, bred and owned by Mr. John Lindsay, of Kembla Park, Unanderra. Both animals were by Earl Beaconsfield, a purebred Ayrshire, and out of the ordinary run of Illawarra types. Yet there was every evidence in Whiteback's appearance and quality of the once famous Longhorn. She was tested for the milk-test prize given by the Wollongong A. and H. Society, in 1888, when she produced 65½lb. of milk in 24 hours. In 1891 she was tested for Kiama A. and H. Society's milk-test prize, producing 70½lb of milk in 24 hours. On the Wollongong showground in 1894 she gave 50½lb of milk in one milking, which must be considered a great performance. Those of us who saw Whiteback would not marvel over her previous records, but when we are confronted with the fact that a cow possessed an udder that could contain 50½lb of milk, it in itself ought to be sufficient to convince breeders to beware of bulls that produce cows with a fleshy or beefy udder, especially as the amount of milk yielded by a cow depends on the activity of the milk-glands in the udder; and this, in its turn, is influenced by a number of conditions. For one thing, it seems to be dependent on the amount of milk the udder contains. Thus, so long as the

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

udder is comparatively empty, and other circumstances are favourable, the secretion of milk by the milk-glands seems to take place unhindered. But whenever the udder becomes full of milk, the rate at which the secretion goes on is diminished. It still goes on, however, as is evidenced by the distention of the udder which takes place under such circumstances, but no longer at the normal rate. The pressure to which the udder is subjected seems to affect the nature of the secretion, the quality of the milk being different. Take also Whiteback's half-sister Honeycomb, she was tested in 1892 for the Berry A. and H. Society's herd book, and produced 100½lb of milk in 36 hours (three milkings); and in 1893, for the same object, she was tested by Mr. John Thorburn, when she produced 124lb of milk in 36 hours (three milkings). Those who were in a position to know, stated that Honeycomb resembled in appearance the best types of cows bred by Mr. Andrew McGill, in Illawarra, in the early sixties.

The idea some people have of the maxim "Like begets like," led many breeders to think that all that was required was to breed cattle up to a high standard of excellence, their progeny would perpetuate the quality of their sires and dams, forgetting Nature's law which provides for a dam suckling but one calf per year. The experience of most breeders is to raise cows that would suckle four calves comfortably, whilst carrying within them a large-sized unborn calf. This state of things could not possibly continue for many generations; hence we have many disappointments in the progeny of cattle bred from these extraordinary producers. Amid the difficulties, therefore, by which breeders are so often beset, none seems much more important than the influence of the unborn calf on its mother whilst she is producing an abundance of rich milk. When we compare the progeny of heavy milkers with those of only moderate milkers, the comparison is only too often in favour of the latter. "Like begets like" is a little-understood maxim; words which, because they contain a certain vague idea of breeding, easily perceived, present the deceptive appearance of perfect clearness, while, on account of the number and variety of objects to which they apply, they are susceptible of a variety of meanings. Why have we so many breeds and varieties of cattle? Simply because soil, climate, and environment are constantly acting on, and influencing animal life. At no time during the life of an animal is their influence more effective than in the early stages of the unborn calf, particularly at the moment of conception. After birth, of course, the food, the soil, the climate, and the treatment the young receive, puts the finishing touches on the mature animal. But one need not pursue the endless enumeration, though it seems necessary to dwell on it from time to time, even at the risk of fatiguing the reader. Whatever, therefore, be the acceptation in which the words "Like begets like" be taken, it is apparent that they always imply the absence of a cause which has not been defined or at least clearly comprehended.

It is characteristic of the minds of those dairymen who are ambitious to possess the best types of dairy cattle to be ever engaged in passing judgment on their own and their neighbour's cattle. No sooner do they apprehend than they judge. They allow no point to stand by itself. They compare, contrast, connect, and classify, according to their knowledge, whether theoretical or practical, or, perhaps, from that knowledge gained by constant association with men of genius and more general experience. Of the judgments thus formed, which in time become aspects in their minds of the animals which have passed under review, some are mere opinions which come and go, or which remain, only till newer ones displace

THE BATTLE OF THE BREEDS.

them, whatever be the influence which they exercise meanwhile. Others are firmly fixed in their minds, with or without sound reason, and have a hold whether they relate to good, practical points or not, or to well defined principles, or merely prejudices, imaginations, or convictions.

Many attach too much importance to outward appearances, which are thus variously viewed, not only by various minds, but by the same mind, because these appearances lie in such near relation that each implies the other. For example, take our yearling section of dairy cattle, at any important agricultural show, and we often feel amused when a judge who has given his awards for a certain prize, turns round when the same animals are placed before him for another prize and reverses his decision. This goes to show that in either instance the judge was working on nothing more than ideas which he had mistaken for sound practical experience. Thus, with all their intimate knowledge of animal life, and of the structure of dairy animals in every stage of development, they have not arrived at a true definition of what constitutes an ideal animal, but are forced to enumerate properties and accidents by way of description. Over and over again attempts have been made to determine the leading points of our dairy animals, and they have been called "the point system of judging dairy cattle," but in every case they were ambitious efforts. Others, endeavouring to be more practical, have introduced cow tests in order to perfect each breed by keeping nothing but the highest producers. Cow tests, it is true, have done good, if only for ascertaining the correctness of developments in general; but they are insufficient for the guidance of individuals in the case of so large and complicated a problem as that of dairy cattle breeding. They merely aid one's enquiries, and support one's conclusions on particular points. They are of a scientific and controversial, not a practical character, and are, therefore, instruments rather than warrants of right decision. Moreover, they rather serve as answers to objections brought against the actual decisions of judges, than proofs of the correctness of those decisions. Further, cow tests are no guarantee that the progeny of the highest cows are sure to equal, much less excel, their progenitors, either in quality or constitutional vigor. It is those dairymen who have for a score or more years watched calves grow and develop into heifers, and then from heifers into cows, who should be best capable of forming opinions concerning their neighbour's stock. Yet, alas, how often have we seen these practical men falter when confronted with animals of the same breeding (though raised under different soil and climate conditions), placed side by side in the show-ring, notably the Royal Agricultural show-ring in Sydney.

Seeing, therefore, the difficulties that beset those beginners who imagine they can, by going on the general appearance of the cattle they buy or breed, produce profitable dairy herds, it is better for them to turn their attention to breed, and endeavour by careful mating and crossing to build up a herd from the best herd procurable. This statement is made advisedly, as the writer is aware of the difficulty that exists in obtaining the best breed or breeds, and the best strain or strains of this or that breed. Further, it is a most difficult task to convince any number of breeders that their particular fancy in cattle is not the best in the world. As cultivation brings out the colors of flowers, domestication changes the character of animals; and while it is impossible to lay down first principles in which all will unite, it is utterly unreasonable to expect that this breeder should yield to that, or all breeders to one. I do not say there are no constant basic principles, on which all breeders are agreed, in fact, there are many, but there are some important points that are not sufficiently commanding to be the

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

basis of mutual agreement and action. For it is easy to show, in a short and lively manner that such points in a dairy animal or a breed of dairy animals, that this and other things are liable to objection; that this or the other thing is of little importance in itself; but impossible to show, in like manner, the united and convincing forces of the whole argument in one view.

Hence we may expect to have a continuation of the "Battle of the Breeds." If a new breed of dairy cattle is to be aimed at, the breeder must grasp the laws of assimilation. For example: In the physical world, whatever has life is characterised by growth, so that to grow in no respect is to cease to live. It grows by taking into its own substance external materials, and this absorption or assimilation is completed when the materials appropriated come to belong to it, or enter into its unity. Two or more things cannot become one, except there be a power of assimilation in one or other of them. Sometimes assimilation is effected only with an effort; at other times it is impossible. But in the case of dairy cattle breeding the object is to aim at that type and color that will assimilate all others. We have a practical example of this in the late Mr. William Coman's cow Beach. Mr. Coman commenced breeding dairy cattle in 1842, at Eurobodalla, in the Moruya district, with the prevailing breeds of cattle in those days, the Longhorn and the Longhorn Durham. He shortly afterwards introduced the Red Norfolk polled breed, which were then excellent dairy cattle, with the object of giving color to his herd. He then purchased Young Ajax, by Ajax (imported by Mr. William Campbell, of Bergalia, Moruya, in 1848. And in the course of a few years the Coman breed of cattle became celebrated for their dairy quality. He was afterwards successful with a valuable bull bred by Mr. Chisholm, of Goulburn, named Oscar. Oscar was by Inkermann (imp.). Inkermann was bred by Mr. John Unthank (England), and was got by Duke of Hamilton (19,618-C.H.B.). His dam was Playful, by Inkermann (14,730 C.H.B.). The cow Beach is descended from the Oscar strain, but she has inherited the deep red colour of the red polled Norfolk breed. Beach has a record of 66lb. of milk, registering 5 per cent. butter fat, in 24 hours, at Cobargo show. Mr. Coman was one of the most successful breeders of dairy cattle in New South Wales, his well-known brand W.C. could be seen in nearly all the noted herds from Bodalla to Twofold Bay on the south, and as far north as Terry's Meadows, and Dapto, Messrs. William Wilson and Evan Evans jointly purchased several batches of heifers from the Squire of Eurobodalla. In later years the late Mr. George Chapman, of Eureka, Kiama, purchased a light roan bull of excellent quality, bred on the same lines as the cow Beach. Chapman's bull was a particularly fine animal, with great length and depth of body, displaying much Longhorned-Durham blood in his appearance and quality.

CHAPTER XII.

RETROSPECTIVE REFLECTIONS.

Unfortunately, history is very silent in reference to those sturdy pioneers, who left their native homes and faced with stout hearts and keen intellects the wilds of New South Wales in the late thirties and early forties. 'Tis said: "The poor go forth to war to fight and die for the delights, riches, and superfluities of others, and they are called heroes." But greater heroes were those men who left their native lands on account of pernicious land laws, to seek new homes in the wild bush of Australia. Yes; and those men who rebelled against the laws of their country, which they considered unjust, and were sent to Australia, and afterwards became her best pioneers and settlers, were also heroes in the true sense of the word. But many hundreds of them lie in uncouth graves unknown. We should make no excuses for mentioning this subject, as our nation has been long enough before the world to justify us in dealing with it as a fact in the world's history. It may indeed legitimately be made the subject-matter of documents, and the reasonings of individual minds, and may thus become public property.

To revert, however, to the question of assimilation as a potent factor in cattle breeding, we will glance at the breeding of Mr. George Tate's cow, Tot of Oakdale. As has been stated elsewhere, Mr. George Tate's father, whom we may term a native of New South Wales, as he was born at sea on his parents nearing the port to fulfil an engagement with Mr. Surveyor Oxley, at Camden, commenced cattle breeding at Broughton Village, near Gerringong, in 1856. His first stock were cattle specially selected from Henry Osborne's cattle bearing the HO brand. Later on he purchased heifers from Messrs. Hawdon and Coman, of Kiara and Eurobodalla, in the Moruya district. He then bought a bull from Mr. Boxsell, of Broughton Creek, which he called Boxsell. After this, it may truly be said Mr. Tate's herd became famous. He, however, became smitten with the pure Shorthorn craze in the early seventies, and purchased a bull named Napoleon from Messrs. Barnes and Smith, of Dyraaba, Richmond River, and later still another, Prodigal, from Mr. Thomas Lee, of Woodland, Bathurst. About this time Mr. Gabriel Timbs, of Terry's Meadows, possessed one of the best types of the Major bull, bred from an HO cow, which Mr. Tate purchased and placed in his herd. This bull was exhibited, and obtained first prize, at the Kiama show in 1879. His son, Mr. George Tate, of Oakdale, Kangaroo Valley, has since followed in his father's footsteps, and we are, therefore, quite justified in placing his great cow, Tot of Oakdale, on the list of celebrated Illawarra cows, and also as an object-lesson of the assimilation of blood in dairy cattle breeding. Before committing ourselves to any definite statement, it would be necessary to comprehend fully the relation which each strain used in producing that animal bears to each other. To do this we must examine in detail each of the elements claiming preponderance. Of course, in the absence of details relating to the breeding of Tot of Oakdale this cannot be done at present.

When Newton proclaimed to the scientific world the fruits of his profound calculations, how many of his disciples could flatter themselves that they were able to confirm them by their own convictions? It is in a less scientific degree so with cattle breeders. One

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

breeder says: "I bred this or that cow or bull on certain lines." his neighbours, who have been probably less successful will say: "Show animals were not bred on the lines laid down for our guidance by Mr. So and So." Hence this age of doubt and scepticism in matters appertaining to reliable records of cattle breeding. Cattle breeders who have endeavoured for a number of years to perfect a system by which they could breed show animals, and heavy producers combined, have invariably become disgusted with their system in the end. They have, unfortunately, passed one by one out of the arenas of our showgrounds without giving us any information regarding the weakness and defects of their system of breeding. We do not expect men who have kept to the front for a few years by a system of dealing and bogus pedigreeing, in and with stock trying to hide their tricks of the trade! But why should cattle breeders deceive themselves by fancying that they know that of which they are really ignorant? The science of breeding dairy cattle in common with all science requires much comparison; and there can be no comparison where selfishness is as prevalent as it is among many of our stock breeders. If it be, however, that there is also always a fund of good sense which cannot be destroyed, there is much hope for the future of our dairymen. When, therefore, certain individuals of lofty imaginations concerning their superior knowledge of stock breeding attempt to involve their neighbours in their error, the multitude invariably answers with a smile of derision, or if it allows itself to be seduced for a moment, it soon returns to its senses, and repels with indignation the notions, and conceits, of the ambitious ones. Passionate declamation against vulgar parade of knowledge, is, as a rule, the most effective weapon; but it is only those intimately acquainted with human nature who are capable of dealing with bodies of men who exhibit docility in following, and a willingness to believe all that is said without examination.

I consider it better to accept the breeder's theory in preference to the theorist who merely gains his knowledge by looking over the fence. The latter's opinions, on being analysed, are found to signify nothing more than the instability of things human; an instability the knowledge of which does not, as a rule, enable them to breed good animals for their own use. The above remarks apply generally to certain expressions which are heard just previous to, and after, any local or metropolitan show. A writer in an Australian journal, who had recently (1909) visited the Kiama show, stated: "The cows in milk form a class which would rouse fond longing in the mind of any man who makes dairying his business. Here roan predominated, and the animals were nearly all big, deep bodied milkers, with tremendous vessels, and large, well-placed teats. Every cow would be considered a stud animal by its district, albeit there was probably not one absolutely pure bred in the yard." These remarks are very nice in their way, and, to a certain extent true. But all heavy producing cows do not breed the best calves. It requires a lot of sound judgment, based on experience to decide that question, which as is well understood by a few farmers in every dairying centre of the State. But where the writer of the paragraph just quoted gets into deep water is in questioning the purity of blood in those cows; bred, as they were, for dairying purposes solely! For example: Suppose a horse-breeder had in his possession a thoroughbred mare of strong, robust proportions, and in due time he stinted her to a pure bred Arabian horse. What would the progeny of that mating be termed? Pure, or not pure bred? This question is all the more puzzling when we reflect that it was from the Spanish and Arabian horses that our thoroughbred English horse was evolved.

RETROSPECTIVE REFLECTIONS.

and all three breeds were, and are now used for the same purpose, namely, speed. It would appear, therefore, to be much the same thing when crossing dairy breeds of cattle is being carefully considered, to keep the object in view.

Let us take the bull Belmore. He is a very dark red in colour, of good quality as a dairy bull or the ordinary Illawarra district type. However, if we come to examine his photo we are at once struck by a peculiarity in his general outline. He was bred by Mr. William Moles, of Tongarra, Albion Park. Sire, Orion, dam Eureka. Orion was bred by Mr. Hugh Dudgeon, Jamberoo, and Eureka was of the McGill strain of dairy cattle. Thus it will be seen that there was the blood of the Red Lincoln in Belmore's sire and dam which would account for his very dark red colour and peculiar outline. Coming direct from a long chain of prize-winners, Belmore was also a consistent prize-taker.

Looking at the question: What constitutes an Illawarra dairy Durham or Shorthorn? as some authorities term those splendid types of dairy cattle, which are illustrated in this book, it cannot be said that there is one aspect deep enough to exhaust the real composition of any one of those really genuine dairy animals; no one term or definition for their general appearance or perfections, though, of course, one representation of it is more just and exact than another, and in the writer's opinion that representation should be defined as Durham-Ayrshire. Even when the idea formed of the type is very complex, it should be allowable for the sake of convenience, to consider its aspect, however indistinct under the above definition. Thus, with all our intimate knowledge of animal life and of the structure peculiar to dairy cattle of both sexes, we have not yet arrived at a true definition of any one of them; but are forced to enumerate properties and accidents by way of description when called upon to decide which is the better of any one of two animals, when placed side by side for comparison. But the question arises: Have we been able to define the qualifications, either from the standpoint of breeding or general appearance? Our answer must be a most emphatic No! This is patent from the fact that our best recognised judges of dairy cattle have discarded bulls and heifers that afterwards proved to be of the highest possible utility as sires and dams.

That the beef Shorthorn has been evolved from the Longhorned Durham, by a judicious system of in-and-in breeding, and feeding, has been clearly proved in these pages; and, further, that the milk-producing qualities of any of the modern Shorthorns are the result of atavism, or crying-back, to their original ancestors, has also been demonstrated. That being so, why not call these "cry-backs" by their proper name—milking Durhams?

Those of us who have seen the progeny of these cry-back bulls developed into heavy milk-producing cows, also know that it only requires mating them with beef Shorthorn bulls of probably the same tribe as their sire, to convert their progeny into cows that could scarcely sustain the life of their own calves, thus reverting back to the beef-producing type again. The very fact of this happening as it does with consistent regularity, has been the Waterloo of all our dairy Shorthorn breeders whenever they have attempted to establish a purebred dairy Shorthorn herd. It is not that they could not succeed in their ambitious project; but they never seem to have the time, patience, and money at their disposal, provided they had the necessary knowledge, to carry it out successfully, and in consequence they fell back on the quickest expedient of getting milk-type and milk-quality combined, by silently and

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

secretly working in the Ayrshire, by mating Shorthorn bulls and cross-bred Ayrshire cows.

Dairy Shorthorn breeders point to the uniformity of types and color as their sole guide to-day. But let us glance at those two illustrations, Barney II., of Alyne Bank, and Barney II., of Netherdale. They possess the fancy Shorthorn color, roan, and conform to the dairy Shorthorn type. Yet we have the unimpeachable evidence of their owners that there is a large percentage of Ayrshire blood in their veins. Turn again to Mr E. J. Marks' cows, Fuchsia, Betsy, and Queen II., and we find in each the desired color and milking type just referred to. Yet, they contain, according to the breeder's own statement, from one-half to three-quarters of Ayrshire blood in their veins. The dairy quality, type, and color of Mr. Marks' cattle was such as to command the attention of good judges at recent shows in Kiama, and yet the bull which he considers suited his purpose best was Terragong, a small brown and white Ayrshire bull, bred by a Mr. Montgomery, in the Bong Bong district. Take Queen II. as an example in cattle breeding. In 1855 the late John Marks commenced dairying with stock of the Normandy-Ayrshire strain of Macleay, Ulladulla. One of these cows was a noted dairy animal. At the Hon. John's sale, in 1875, the late Mr. Samuel Marks purchased a cow descended from that noted animal. In 1882 the writer bought in for Mr. Marks' own use a cow descended from the one he purchased twenty years previous. Queen II. is descended from that cow, with all the characteristics of her progenitors. Whilst scientists are generally of the opinion that breeders of our domesticated animals should aim at conformity of type, with a view of getting the best for the purpose for which they are breeding, they are just as silent on that most fleeting of all characteristics, color. Nevertheless, most modern breeders believe that when a herd of cattle, large or small, of whatever breed they may be, should not be allowed to run into too much white, as they consider it is an unmistakable sign of too much in-and-in breeding.

Take the colors of our dairy cattle as far back as the oldest of our dairymen can remember, and it will be found that red, red and white spotted, strawberry, light roan on body, and dark roan on neck and head, and those old type dairy cows with white back, white face, and yellow, or strawberry sides, with horns either wide spreading, hooped, or corkscrew-shaped, were the prevailing colors among the Illawarra dairy cattle. The prevailing Ayrshire color was either red and white, and dark brown and white, the white occupying but a small space on the animals body, and then always clearly defined. The writer does not wish to affirm that these were the only cattle colors; they were, however, the fancy colors of those days. The writer also knows full well that spectrum analysis would fail to depict greater varieties in color than was to be found in our early dairy herds—when one cow was worth two of the present day—but the red roan was scarcely, if ever, seen among our choicest herds.

Dairying as an industry, and dairy cattle breeding as a source of pleasure and profit to many families in this State, have been long enough under our observation to justify dealing with them as facts in Australian history. Their characteristics and worth, their scientific associations, their commercial aspect, cannot be treated as matters of private opinion or deduction unless we can so regard all passing industries, or industries such as mining. They may, indeed, legitimately be made the subject-matter of practical experience or theories, to wit, what is their social and commercial worth, what is due to their location in the range of ideas or of facts which we

RETROSPECTIVE REFLECTIONS.

possess, whether it is to be but temporary or lasting, how far favourable to the advancement of a higher civilisation? These are questions upon the fact, or the professed solution of the fact, and belong to the province of opinion; but to a fact do they relate, on an admitted fact do they turn, which must be ascertained as other facts, before anyone desirous of entering upon these industries should risk his capital.

To those already engaged in these industries, the question should not require very much theoretical study. They should have long since passed beyond the reasoning of individual minds, and their opinion should have long since become public property. Instead, however, of the public getting any benefit from the opinions of our long-established dairymen and dairy cattle breeders, the people of this State will find on reflection that, with but very few exceptions, these men of long experience are invariably silent as the graves of the ancient Danes in Ireland, until they have first grasped the opinions of the other fellow. Even then they only enter upon a discussion of enquiry so as to ascertain, if possible, where the other fellow got his information.

One theory has met with wide acceptance during the past twenty-five years; namely, that cattle breeding does not fall within the province of history, and that it is in consequence a science to each breeder, what each breeder thinks it to be, and nothing else; that, in fact, the word breeder is a mere name for a man who has accidentally become possessed of a few head of good cattle, not because there cannot be assigned to all breeders one and the same system as the common foundation of all theories; but because certain points of agreement may be found here and there of some sort or other, by which each in its turn is connected with one or other of the rest. Or, again, it may be either implied or maintained that all existing theories of cattle breeding are wrong. Therefore, to solve this problem, writers must have recourse to history in order to study the system practised by the cattle breeders of ancient and modern times.

Furthermore, since systems, practical or theoretical, of breeding dairy cattle, have one and the same great comprehensive subject-matter, they necessarily interfere with one another as rivals when placed side by side in cold type, both in points of agreement and difference. Thus dairy cattle breeding since its rise in Illawarra upwards of eighty years since, has been in these circumstances of competition, a conclusion sufficiently evident from the foregoing chapter. It has been from the first surrounded by all sorts of conditions, the result of diverse opinions, which contemplated the same problems, by sometimes advocating the same facts, which portrayed the same animals as being of different breeds, whilst they wore in no slight degree the same external wedge-shaped appearance, with various-colored hair.

Events move in cycles; all things come round; and weakness is but the resulting product of power. Hence a high-class dairy cow is usually the product of a purebred and a cross-bred sire and dam. There is no limit to such development, unless it be that over-production, like over-wisdom, is folly, a paradox which seems to imply that too much of what is good is evil. Had each breeder the power, while keeping his own fancy breed true to its own identity, instead of absorbing his opponent's breed, as Aaron's rod devoured the rods of the sorcerers of Egypt, there probably never would have been such bitterness displayed between the breeders and owners of the present-day Illawarra breed of cattle, and the breeders and owners of those animals carrying the MS brand. It is, there-

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

fore, quite consistent with the tenor of these remarks to observe, or to allow, that even among the purest of our dairy Shorthorn herds many intermixtures have sometime or other obtained from their intercourse with other breeds, owing to the admittance, directly or indirectly, of the latter into these herds. This is at once patent to the practical eye from the resemblance which exists between the admittedly cross-bred animals and those in which the alloy is strenuously denied to exist in any shape or form.

We are told, of course, that every breed of animal must have had a beginning, and in order to make that beginning all sorts and conditions of animals must be admitted into the evolutionary cycle, provided they represent the type and color desired. But it may be argued what is wrong with any other breed that will give the same type, notwithstanding its variety of colors, but better at the milk pail? It is at the constitutional vigour and productiveness that all practical dairymen look when selecting cattle for their own use. On these grounds the present-day *Waarra* type—bull or cow—will compare more than favourably with any other breed of dairy animals. Then why not persist with them, although they may contain an admixture of Ayrshire blood in their veins? Why attempt to eliminate the Ayrshire blood from a Shorthorn dairy animal, if it was, and is, considered a very judicious thing to infuse a little Ayrshire blood into such animals?

Here endeth the author's last chapter of reflections and deductions. Having reached the end of my difficult enterprise, I may be allowed to take an occasional view of those old bush tracts over which I have passed in my endeavour to erect a cairn to the memory of those old sturdy pioneers who laid the foundation of and built up the dairying industry and the dairying herds of New South Wales. I undertook to examine what history told us, and what practical experience taught us on these points. I was far from flattering myself that I was able to clear this up in a becoming manner. Nevertheless, I set forth upon my journey, with that courage which is inspired by the love of duty, and the confidence that one is rendering a service to the memory of those men and women who braved the solitudes of our Australian bush in order to make this great country better than they found it. I, therefore, submit my whole work to the judgment of the dairy farmers of Australia.

PART IV.

PRACTICAL ADVICE TO DAIRYMEN.

CHAPTER I.

ON FEEDING CATTLE.

The future of the Illawarra and Shoalhaven districts will very probably be that of the Jersey Isles, inasmuch as they will soon become the main sources of the vegetable and milk supply of Sydney. Sydney and its suburbs, with their ever-extending industries and constant increasing populations, must soon fall back on these centres for their supply of vegetables and milk. The dairy cow being an almost artificial creature, must soon command a place among the family. The capacious udder of the improved cow, the long period of lactation, her wedge shape, caused by the broadening of her hips to make room for her great laboratory to work up raw material into milk, the stomach, her great rotundity and fullness of frame—all these representing the design of breeders to improve and develop the producing capacity of the animal, will be better supported in the future under the newer system brought about by the excess of energy that will be thrown into the efforts to supply the growing demands of the country.

We have learned that milk is a very complex fluid, containing all the component elements of the animal body. The food required, therefore, to produce it should be rich in those elements necessary for the supply of milk and the sustenance of the cow. The great error too frequently committed by dairymen is in supplying a ration from one kind of fodder instead of using a variety. Natural pastures contain a wide variety of grasses, hence their great value as cattle food.

While population is gradually on the increase, and the live stock of the country is constantly multiplying, the capacity of our farms to carry stock must soon be regarded as a measure of value, and that even in a grain region this must soon be considered, for grain is an assistance and not an obstacle to stock keeping; and, on the other hand, stock feeding is an assistance to grain raising. The older countries of Europe have taught us that lesson, inasmuch as they have been able to raise more stock and grain during past years than they did in the previous century.

These countries pasture very little, keeping their fields in crop, and constantly hand-feeding their stock. The manural value of their stock throughout the year may be roughly estimated when it is stated on reliable evidence that the horse produces 12,000lb. of solids and 4000lb. of liquids annually; the cow produces 20,000lb. of solids and 8000lb. of liquids; the sheep produces 760lb. of solids and 380lb. of liquids; the pig produces 1800lb. of solids and 1200lb. of liquids.

It is well known to all farmers that under favourable conditions an acre of land can be made to keep a cow in good producing form during the year. In making this statement it is to be understood that mixed foods and grass are required to make a complete ration for a cow. The cow needs less exercise than almost any other domestic animal, and getting the fresh grass and fodder fed to her in a stall she produces more and richer milk than when she has to hustle for her living. This goes to show that much will depend in future on the system to be adopted by our dairy farmers, and that those nearer the markets must benefit most. It will therefore be wise in our farmers to look carefully after the value of the home-made fertiliser; and as the above estimate has been arrived at from careful experiments, they are worthy of serious consideration. These solid and liquid cow excrements contain large quantities of nitrogen, phosphoric acid, and potash, which are of considerable commercial value in raising

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

crops. Though crops require these three substances, they do not utilise them according to the same proportions, which shows us that the same soils are not required to produce all plants.

Nitrogen may be termed a leaf-former, as it has a stimulating effect on the growth of those plants which are valuable according to the excellence of their leaves as food. Phosphoric acid is considered a more general food, as it stimulates the whole plant, particularly such as grasses and grain plants, acting directly on the growth of the stalk and woody fibre. Potash is a fruit, tuber, and grain food. Potatoes are stimulated to a great degree of perfection by the use of potash.

It is by acting on these simple rules that most of our best manures have been arranged. But, speaking generally, animal refuse and excrement when properly balanced and arranged go to make up the nitrogen and phosphoric acid of some of our finest manures, and when combined with fresh wood ashes compose a most complete manure, a fact which has not hitherto been sufficiently understood by many of our coastal dairy farmers. The lands of Illawarra and the Shoalhaven valleys contained all these three substances in sufficient quantities naturally, but constant heifer raising and milk producing combined with bad systems of cultivation have been the means of robbing the soil of its natural products.

When a cow is giving milk, a large amount of food consumed is used in its production. Fats and carbohydrates are used in forming the fat and sugar, and albuminoids for the casein. A large amount of mineral salts is also absorbed in milk production. In young cattle the mineral salts obtained in the food are largely used in the production of the bones. Those not used are removed by the kidneys. The animal never digests all the food it consumes. The amount left undigested varies with the kind of food and the animal.

When the cow is giving milk, a portion of the nitrogen and phosphoric acid will be removed in the milk, and the manure produced will usually not contain more than from 50 to 75 per cent. of the amount of those substances supplied in the food. When young stock are growing rapidly a considerable portion of the nitrogen and phosphoric acid contained in the food is used in production of bone and muscle, and the manure contains a proportionately smaller amount of these substances than the food. The fattening animal takes comparatively little valuable material from the food, as the greater part of the increase is fat, which contains no plant food.

As milk contains (and the composition of milk gives the key to the proper food for the cow) a large proportion of albuminoids and phosphates, the food must contain enough of these substances to meet the demands for milk in addition to what is required to repair the waste of tissue. If the food does not contain enough of these substances the flow of milk will be diminished, or the cow must use her own tissues for its production. The food should also possess some readily digestible fat, as we have seen that this is contained in milk in considerable quantity. If a food is deficient in albuminoids, the cow may be fed all she can eat, and yet be unable to yield a liberal supply of milk.

In the analysis of all given cow foods considerable stress is at all times laid on the importance of ascertaining their nutritive ratio, especially with regard to the carbohydrates and albuminoids in the food supplied to young calves and heifers. By nutritive ratio is meant the ratio of digestible albuminoids to digestible carbo-hydrates. The carbo-hydrates are starch, gum, sugar, &c. Fat or oil is also a carbo-hydrate, but it is estimated as having a heat-producing and nutritive power 2.4 times as great as ordinary carbo-hydrates. In finding the nutritive ratio of food, then, the digestible fat, multiplied by 2.4, is added to the digestible carbo-hydrates, and this sum divided by the digestible albuminoids. If we take the following analysis of cow's milk—casein, or flesh formers, 4.05; butter, 3.80; milk sugar (food of the respiration and fat), 4.55; salts or ash, .60; water, 87.00—and ex-

ON FEEDING CATTLE.

amine it carefully, we will find that being in solution it is all digestible; if, therefore, the fat, 3.80, is multiplied by 2.4, we get 9.12, and this added to the milk sugar, 4.55, makes 13.67 as the carbo-hydrates of milk, and this divided by the casein or albuminoids, 4.05, and the result is 3.37, which is the nutritive ratio of milk, or 1 : 3.37—that is, milk has 1 of albuminoids to 3.37 of carbo-hydrates.

Most authorities base the value of a food, not upon the actual amount of albuminoids, carbo-hydrates, and fat it contains on analysis, but on the amount of each as digestible by the animal, and this is determined largely by feeding experiments.

With a view of ascertaining the most complete ration for a dairy cow, Mr. T. Horsfall, of England, made some of the most complete experiments on the diet of milk cows. He first calculated a diet from scientific principles, and then applied to this the test of practical experiment. The ration for each cow per day consisted of:—

Meadow hay, 9.33lb.; rape cake, 5lb.; malt combs, 1.5lb.; wheat bran, 1.5lb.; beans, 1.5lb.; green fodder, 34lb.; oat straw, 8.33lb.; bean straw, 2lb.; total, 63.16lb.

In some parts of the country rape cake and malt combs cannot be obtained. Linseed or cotton cake can be substituted, and a diet fully equal to Horsfall's be obtained. If neither of these can be had, an approach to the ration could be made by increasing the proportion of bran—using clover or Hungarian grass and some corn meal. Where it is difficult to obtain, these may be substituted by 13lb. of oat hay, 6lb. of lucerne hay, 2lb. of cracked maize, and 2lb. of bran. This later diet should be carefully mixed and soaked for some time in boiling water; after the water has been allowed to cool to a moderate temperature, the whole mess is allowed to ferment for a few hours and then fed to the cow. It would be necessary with this latter ration to allow the cow pasture of some sort.

As may readily be imagined, upon the methods adopted in feeding cows will mainly depend both their productiveness and profit, and the quantity and quality of the milk will be found proportionate to the nourishment of the food that is given to them. In the dairying districts of New South Wales it is either a feast or a famine; and as droughty conditions seem to largely predominate it is not a matter of which is the better food for a dairy cow, but which food can be obtained at a reasonable cost during these cruel visitations to substitute in a small way the best of all cow foods—namely, nutritious grass. Sir J. B. Lawes at one time exposed many of the English manufacturers of concentrated foods and condiments. Following up Lawes' experiments, Professor Cameron, of Dublin, analysed a number of these advertised condiments. His analysis went to show that the feeding value of these condiments was very low indeed, and that beyond their agreeable flavour and taste, which cattle at all times seem to appreciate, and which cause them to relish other foods, there was little or no return for their use as a cow food.

Professor Stewart, when treating of the subject of cow feeding, advocated the use of flavouring materials, giving it as his opinion that as cattle take pleasure in eating sweet foods he accordingly advocated cheap molasses mixed with cattle foods as a mere appetiser, but to be used only as such. Professor Stewart adds:—A very good condimental food may be made by combining the following materials:—

Articles	lb.	Articles.	lb.
Linseed oil cake	25	Gentian	½
Flax seed	10	Cream of tartar.. ..	⅓
Molasses	20	Sulphur	1
Corn meal	40	Common salt	⅞
Ground turmeric root ..	1½	Coriander	⅞
Ginger	⅛		
Carraway seed	⅓		
	Total, 100lb.		

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

The flax seed may be boiled in ten gallons of water until it forms a thin mucilage; then stir in the turmeric, ginger, carraway, gentian, cream of tartar, sulphur, common salt, and coriander; now add the molasses, then the cornmeal, and ground oil cake, stirring it well together. The water may be driven off by just allowing the mess to simmer over the fire.

A Scotch farmer named Kinnear has given his experience of the influence of food on milk, which goes to show that exact adherence to a definite albuminoid ratio is not of material importance, provided a full supply of food of good composition is given and digested. The albuminoids will then in any case be sufficient to supply both the waste of the body and the demands of milk. An extra allowance of albuminoids undoubtedly stimulates the process of digestion and metabolism, through which the milk is formed, and thus it is necessary in order to obtain the full supply which the constitution of the animal enables it to furnish; but if this is attained the essential point is to furnish digestible elements from which the milk can be formed. As the fat can be derived, according to latest scientific researches, alike from the albuminoids, the carbo-hydrates, and the fat of the food, it would seem not very important whether the one or the other is supplied in excess. This is supported by Mr. Kinnear's practical experience. He finds that within reasonable limits the main point is to furnish the most digestible food without too minute regard to its composition, and that such food will generally approximate to a ratio of about one to five. On the average he has found that 1lb. of dry digestible matter in such food yields 1lb. of milk over a whole herd of fifty cows at one time; that is including cows dry, or nearly dry, as well as those in full flush of milk.

There are, however, certain foods which appear to exercise a specific action on the milk glands, and to cause an increased secretion. One of these is the carrot. This root is largely grown in the Channel Islands, where a yield of 20 tons an acre is obtained. Given to cows at the rate of 15lb. to 20lb. a day, carrots will increase the yield of milk in such a remarkable degree that it is difficult to keep the cows which have this allowance from falling off in condition, no matter how much food of other descriptions is consumed. Brewers' grain used in the distillation of whisky, sweet turnips, &c., have a somewhat similar effect on cows.

Although much has been done in the way of breeding for milk, and although we have a substantial knowledge of food as regards its great importance in the development of all classes of stock, yet we do not seem to have grasped the importance of training our cows for production. Training for this has to be done before and during maturity, that is, from the milk trough to the end of the second year's lactation. It is during that period that the whole system can be affected and the functions intensified for this particular object in life. It is not proposed to change the individual character of the animal, but to make the animal conform to the type most desired in the breed represented. This object is obtainable by raising the dormant qualities by excitement of food, by giving them work and keeping them working, as by this means the never ceasing work of the functions will gradually continue improving the cow until she is well up in years. All real good cows keep on improving year by year both in general appearance and quality for a number of years after giving birth to their third calf. The feeding should be gradual in all its properties; a gradual increase in quantity, variety, and nutritive value.

How should food be arranged to obtain the best results? This is important. Young succulent grass, such as clover, rye, grass, prairie grass, &c., is the natural food for young heifers and milk cows. They will likewise do well on hay in winter, such as grows on uplands, consisting of natural and artificial grasses. But it is a matter of common experience that the best production of young stock or

ON FEEDING CATTLE.



Cow, Tot of Oakdale. Color, Red and White.
Bred by and the Property of Mr. George Tate, Oakdale, Kangaroo Valley, N.S.W.
(For further particulars see Appendix.)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

milk cannot be obtained from average hay alone. To secure the full value of such hay we must combine with it other substances rich in nitrogen, such as bean or maize meal, especially in the absence of clover, which only grows for a few months in the year.

In feeding stock, however, a farmer may take hay, straw, grain, roots, and oil cake, and mix them all together with a view of forming bone, muscle, fat, and milk in each animal according to the quantity consumed. A portion of the food is digestible, nutritious, and useful for these purposes only, as a part of the food is not nutritive, as the animal cannot digest it, and is voided in excrement, and is useful only as manure. It is therefore important to know how much of a given fodder is digestible, and so portion it out that the best use shall be made of the nutritive part. It will be easily seen that unless much care is paid to these points much valuable food is wasted. The question at once arises: How much of the ingredients of different foods will dairy heifers and cows digest when rightly fed?

During the past ten years many scores of feeding trials have been made to ascertain the exact quantities without much definite result, as the periods have only been for months, whereas they should extend over the whole lifetime of the animals for several generations. It is found that unless the ingredients are mixed in proper proportions only a part of the digestible material will be actually digested, while the rest is wasted. By such investigations we learn also which of the food ingredients—such as starch, albuminoids, &c.—are made over into fat, or into muscles or lean meat in the body; also which ones supply the fat of butter and casein of curd; which ones are consumed in producing the heat which keeps the animal warm; and which ones are used yielding muscular force to the body. In short, these investigations only show the nutritive value of different foods, which can be learned from the chemical analysis of the different fodder plants and the calculations of what proportions they should be mixed and fed out to animals according to age and weight, and this is all expressed so plainly that a farmer can understand it without any special scientific knowledge.

But ask any practical farmer what he thinks of those tables, and his reply will be, "Although they are aids to mixing fodder, they must not be followed blindly. We need more system in feeding our cattle; more definite knowledge of what to grow for mixing our cattle foods; more applied science in raising fodder; more cheap money to invest in the cattle industry; more great minds in our Legislature to carry out gigantic schemes of water conservation. Without great supplies of water science cannot prevail."

Good grass from well-cultivated pasture gives all the food a cow yielding milk requires. This statement cannot be overstated nor overestimated, as it is the basis of all our practical knowledge in stock raising. But there are times when grasses lose their best nutritive qualities; then either stall feeding, yard feeding, or paddock feeding is necessary. This latter system is generally termed hand feeding. The question has over and over been asked, how much fodder can a cow, presuming she is allowed out on pasture, consume profitably each day of her existence? This has been answered approximately in several parts of this work. The value of a food depends on its digestibility. Some foods are easily digested, other foods must be given in combination, otherwise the cow's stomach cannot assimilate them properly. Cows are ruminants—they chew the cud. When the food is first swallowed it goes into the rumen or first stomach, from which it comes back again at some suitable time to the mouth for further mastication, after which it is finally swallowed, and passes on to the third and fourth stomachs. The capacity of the stomach in cattle is enormous, amounting to from 50 to 60 gallons. It fills the greater part of the abdominal cavity, and the paunch alone occupies nine-tenths of the entire volume of the stomach, the remaining three divi-

ON FEEDING CATTLE.

sions contributing a mere chain on the front left side of the paunch. The fourth division, or abomasum, being nearest the intestines, is the only part of the ruminant stomach the internal lining membranes of which secrete gastric juice. In other words, only the fourth compartment is capable of exercising the digestive functions. It is called the rennet stomach in calves.

Now, the chief object in cattle feeding is to arrive at the quantity and proportions of the several nutriments required or available for the cows. The standard feeding estimate for milk cows per day is:—Digestible albuminoids, 2.5 lb.; digestible fats, 0.4lb.; digestible carbohydrates, 12.5lb.; nutritive value, 1 : 5.4lb.; total dry matter, 24lb.

In parts of Holland, England, and Scotland, after the cow has calved, the quality of the food given is improved and its quantity increased. Besides a full daily allowance of roots, some bean or pea meal, linseed or oil cake is added. A part of the food is frequently cooked by boiling or steaming the roots along with chaffed hay, to which may be added the different kinds of meal already mentioned, the mess being thoroughly mixed and allowed to stand a few hours before being given. A quantity of salt is added in the proportion of two or three ounces for each cow. The cows in these instances are well treated, as the main object is a large quantity of rich milk.

Although the general utility of feeding standards is almost universally admitted by those who have given the matter study—and this is shown by the number of farmers who are endeavouring to conform with the practice of feeding a rational ration to their cows being continually on the increase—yet there seems to be a difficulty in conveying to the average dairyman in simple language what is meant by a well-balanced ration for dairy cows. This is most important, and worthy of careful thought.

What is probably as plain as the noonday sun to the agricultural chemist is most confusing to the dairyman. This is caused to a great extent by the fact that, after all, the plant or the cow has in its interior the most perfect and complete of all laboratories: The boy, therefore, seated on the milk stool is the best authority, if he be an honest observer, on the proper constituents of our cattle foods.

To arrive at what is required in all cow foods we must first understand that the various substances found in animal bodies may be grouped under four heads, viz.: Water, ash, and mineral matter; fat; and nitrogenous matter. These substances are to be found in the animal body in varying proportions according to age, condition, &c. Water constitutes from 40 to 60 per cent. of the live weight; ash is found mainly in the bones, and constitutes from 2 to 5 per cent; fat is an every-varying constituent, and ranges from 10 to 30 per cent.; nitrogenous matter embraces all those substances containing nitrogen, such as the lean of meat, and constitutes from 10 to 20 per cent.

The same four groups of substances found in animal bodies—that is, water, ash, mineral matter, and fat—and nitrogenous matter—are also found in the composition of food materials consumed by the cow, with the addition of a class called carbo-hydrates.

Now, if we take these substances in rotation, we may be able to understand them:—

Water.—All foodstuffs, no matter how dry they may seem, contain a certain amount of water, varying from 8 to 15 per cent. in grain and dry fodder; 75 to 80 per cent. in green fodder; from 85 to 90 per cent. in root crops.

Ash.—When a foodstuff is burned and all the organic matter driven off, the ash remains. The ash of the food is most important, but it is plentiful.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Fats.—This group embraces the materials which may be dissolved from the foodstuffs by ether. Carbo-hydrates also supply fats under the heading of nitrogen-free extract. Hence, since the carbo-hydrates and fat serve nearly the same purpose in the animal economy, they may, for convenience, be grouped together.

Nitrogenous Matter.—This is the protein of foods. The term albuminoids is sometimes used to designate this group. Its function is to supply the waste of the animal body. On the other hand, the word protein is used. Since then, therefore, the protein on the one hand, and the carbo-hydrates and fat on the other, serve, in the main, to fulfil the different purposes in the animal economy, it becomes evident that the relative amounts of these nutrients in the food are important. This relation is expressed as the "nutritive ratio," which means the relation of digestible protein to digestible carbo-hydrates and fat. The nutritive ratio is found by dividing the carbo-hydrates, plus 2½ times the fat, by the protein. By following out these hints to their logical conclusion, and then by carefully comparing the analysis given by chemists of the amount of digestive substances contained in foodstuffs, something definite can be arrived at.

Professor Brown, who has gone to much trouble to ascertain facts about cow foods, gives a table of feeding values of certain stuffs in use for milch cows in Australia:—

Name of Food	Digestible Albuminoids	Digestible Fats	Digestible Carbo-hydrates and Fibres	Nutritive Ratio, as 1 to 10.
Green Fodders—				
Maize	1.03	.28	10.38	10.2
Sorghum .. .. .	.73	.38	10.76	15.9
Maize silage	1.09	.52	10.92	11.2
Sorghum silage .. .. .	.58	.36	14.44	21.3
Peas	2.20	.30	7.40	3.7
Rye	1.61	.28	6.94	4.7
Rye silage	1.28	.17	9.18	7.2
Pasture mixture	2.50	.40	9.90	4.4
Italian rye	2.30	.40	12.60	5.9
Perennial rye	1.80	.40	12.20	7.2
Oats	1.30	.20	8.90	7.2
Red clover	1.70	.60	8.70	5.7
Lucerne	2.10	.30	8.00	4.1
Tares	2.50	.30	6.70	3.0
Rape	2.00	.40	4.80	2.9
Paspalum dilatatum, Barley, Hay—				
Hay—mixed, &c.	9.20	1.50	42.80	5.1
Rye grasses	0.10	1.10	38.40	6.8
Oat straw (no grain)	1.37	.62	42.68	32.7
Wheat straw (no grain) .. .. .	.85	.54	37.69	45.9
Pea straw (no grain)	8.00	1.58	28.44	4.0
Paspalum dilatatum, Grain—				
Wheat	0.96	1.68	67.79	7.1
Oats	8.70	4.10	46.67	6.5
Barley	0.54	1.86	61.06	6.8
Peas	18.49	1.07	54.53	3.1
Maize	8.37	4.67	64.75	9.1
Wheat bran	13.04	2.97	45.74	4.0
Wheat middlings	11.37	2.81	52.64	5.3
Roots—				
Mangolds	1.30	.20	4.9	4.1
Swede turnips	1.30	.10	10.60	8.3
Carrots	1.40	.20	12.50	9.3
Fodder beet	1.10	.10	10.00	9.3

The relation of food to butter-fat has been one of the most debated questions connected with the dairy cow and her management. It has

ON FEEDING CATTLE.

been made the subject of much investigation by many of the leading experimentalists during the last few years, and the results of these experiments have been published from time to time. In the main these investigations have been carried out with a view of obtaining definite knowledge with regard to the relation of food to milk-fat in order to solve the question as to whether or not the percentage of fat may be permanently increased by feeding. Notwithstanding all these experiments, we have little information beyond theories which are based on the results of these experiments.

One theory has been long held that milk-fat is produced from the protein in the food. If this were the case a natural supposition would be that by increasing the amount of protein in the food the proportion of fat in the milk would be thereby increased.

Another theory is that milk fat is produced from the fat in the food. Then feeding an increased amount of fat might be supposed to result in a higher per cent. of fat in the milk.

A third theory, and one that is more widely entertained, is that so long as the animal is well nourished the percentage of fat in the milk is not appreciably affected by even wide variations in the character of the food—provided the food does not contain too much water.

Professor Whitcher says :—" A given animal by heredity is so constituted that she will give a milk of certain average composition, and that by judicious or injudicious feeding the amount is not largely varied ; the quality of the milk, therefore, being chiefly determined by the individuality of the cow." Professor Kuhn (Germany), however, found that the addition of one pound of oil to the ration increased the quantity and quality of the milk. But he considered "that this added fat had no direct influence on milk production, but that it has an indirect effect in this manner : That a certain quantity of protein is thereby made available for milk production, which before the feeding of the oil was used in sustaining the animal body ; but the fat now performs this office, and permits the protein to be used for producing milk." His experiments therefore go to show in the clearest possible manner how greatly the milk production, and the possibility of influencing the composition of the product, are dependent upon the individuality of the animal and her power of assimilating oil.

There are other lessons to be learned from these experiments. For instance, it would appear that the reason for apparent fluctuations of the percentage of fat in milk when a change of food is given is more in the disturbance caused by the change than because of any extra value of the feed itself. It is well known that when a radical change is made in the food of a cow the secretion of milk is greatly affected. How long the fluctuation may continue depends upon the capacity of the cow to accustom herself to the new feed, which time may take days or weeks. And when the cow has become accustomed to the change of feed her milk falls back to its normal average condition.

As Professor Wing states :—" While there is a distinct difference in the quality of the milk of the different breeds, the different individuals in the breed also vary largely in the quality of the milk. The difference in the percentage of fat in milk from different cows of the same breed is quite as great as the average difference between the breeds ; that is to say, the difference between the highest and lowest percentage of fat in the milk of different individuals of the same breed is as great as the difference between the average percentage of fat in the breeds giving the richest and poorest milk."

Apart from feed, a dairy farmer should try to make it as agreeable as possible for his cows in hot weather by providing them with plenty of shade and water. Long drives to and from the pastures are very trying on dairy cattle, and therefore affect the milk yield, considerably lessening its quantity and quality, besides being injurious to the cows in the form of unnecessary excitement.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

The question whether the whole, a part, or any of their food should be cooked for dairy cows, when being house fed in winter has often exercised the minds of their owners, and various and discordant have been the opinions expressed on this point. On the one hand it has been stated that such food is more digestible, and consequently more nourishing; that by cooking, substances otherwise useless can be made available for food; and that the warming of food by cooking is agreeable and good for the animals in cold weather. On the other hand, it is contended that giving cooked food to ruminating animals, such as cows, tends to impair ultimately their digestive powers; that it makes them tender and more easily attacked by disease; that the results are not commensurate with the trouble and expense of cooking the food and otherwise tending the cows.

There is, however, evidently a good deal to be said on both sides. It is the opinion of many that in certain cases cooking at least a portion of the food is advisable, and in other cases it is better to supply it uncooked. Much must depend on the circumstances of the owner, the feeding and appliances at his disposal, his buildings and his pecuniary means, and more particularly on the price obtained on the products of the cows, as well as the bringing up of the cows to accustom them to such treatment.

The complicated arrangement of a cow's stomach is evidently intended by Nature to enable the animal to lay in a large store of food at once, to be masticated and digested afterwards at leisure, and to enable it to make use of and digest coarse, bulky vegetable food which would require a long preparation to make it fit to be used as nourishment. That applies particularly to breeding cows.

One may safely conclude that cows do best on uncooked food, provided it is good and plentiful. In this respect pasture grasses have hitherto given the very best results, both as regards the raising and profitable upkeep of dairy cattle in all dairying centres.

CHAPTER II.

IN-BREEDING.

From time to time it has been a disputed point among our coastal stockowners whether the system of in-breeding or the opposite one of frequent crossing has the greater tendency to maintain or improve the character of stock. The advocates of both systems, however, do not seem to argue with that fulness of knowledge required for such an important contest. The truth probably is, as in some other similar disputes, that to a certain extent or within certain limits the contestants can see a certain amount of right and wrong on either side, owing to the fact that in-breeding and cross-breeding are terms so carelessly used. Those who argue against in-breeding generally quote such writers as confine the phrase to the coupling or mating of those animals of exactly the same blood—namely, brothers and sisters, while others include in it breeding from parents and offspring; and others still employ the term to embrace those of a more distant relationship. For the term “in-breeding” the latter is probably the more fitting, as the prevalent opinion is decidedly against the practice of breeding from any near relationship, as it is considered that few animals in a state of domestication are wholly free from hereditary defects and diseases.

Cross-breeding, as well as in-breeding, has its strong and weak points. Some define cross-breeding as mating a thoroughbred and a half-bred animal, as in horses. But the more suitable definition of cross-breeding for our purpose is the crossing of two distinct breeds that have been bred for generations for the same purpose—namely, the cross of the Jersey bull with the Ayrshire cow—a cross which has been proven to be important to those who combine dairying with stock raising as a livelihood.

To return to the subject of in-breeding, it may be interesting to many of our critics who have been clamouring for the introduction of new blood into the dairy herds of Illawarra and Shoalhaven for years past to study the following article, written by the editor of the Irish “Agricultural Gazette” in 1860, on a cow bred by Mr. Charles Colling, named “Charmer” :—

“Probably few who have not critically examined the facts regarding close breeding in the improved Shorthorns are aware of the extent to which it has been carried. Mr. Colling after he procured the historic bull ‘Hubback,’ selected cows most likely to develop his special excellences, and from the progeny of these he bred very closely. From that day to this the Shorthorns have been closely bred. ‘Charmer,’ bred by Mr. Colling, sold for £600. It is unquestionable that the ability of a cow or bull to transmit the merit either may possess does in a great degree depend upon its having been inherited by them through a long line of ancestry. Nothing is more remarkable than the way in which the earlier improvers of the Shorthorn breed carried out their belief in this. They were indeed driven, by the few comparative well bred animals at their command, to use the same sire on successive generations of his own begetting, while breeders nowadays have the advantage of fifty different strains and families from which to choose the materials of their herds.

“But whether it was necessity or choice that compelled the earlier breeder to in-breed, it is certain that the pedigree of no pure bred Shorthorn can be traced without many illustrations of the way in-breeding has influenced its character, deepened it, made it permanent, so that it is handed down unimpaired and even strengthened in the

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

hands of the judicious breeder. What an extraordinary influence has thus been exerted by a single bull on the fortunes of the Shorthorn breed. There is hardly a single choice purebred Shorthorn that is not descended from 'Favourite' (252), and not only descended in a single line, but descended in fifty different lines. Take any single animal, and this bull occurs in a dozen of its preceding generations, and repeatedly up to 100 times in the animals of the more distant generations. His influence is thus so paramount in the breed that one fancier he has created it, and that the present character of the whole breed is due to the accidental appearance of an animal of extraordinary endowments on the stage at the beginning of the present century. And yet it is not so; he is himself an illustration of the in-breeding system, his sire and dam having been half brother and sister, both got by 'Foljambe,' and this breeding in and in has handed down his influence to the present day in an extraordinary degree. 'Charmer,' from which, as may be seen elsewhere, no fewer than 31 descendants were sold by auction in one day, had, of course two immediate parents, four progenitors in the second generation, eight in the third, sixteen in the fourth, the number necessarily doubling each step further back. Of the eight bulls named in the fourth generation from which she was descended one was by 'Favourite.' She is one-sixteenth 'Favourite' on that account, but the cow to which he was then put was also descended from 'Favourite.'" So are each of the other seven bulls and seven cows which stand on the same level of descent with the gr. gr. dam of 'Charmer,' and in fact it will be found on examination that in so far as 'Charmer's' pedigree is known—which it is in some instances to the sixteenth generation—she is not one-sixteenth only, but nearly nine-sixteenths of pure 'Favourite' blood. This arises from 'Favourite' having been used repeatedly on cows descended from himself. In the pedigree of 'Favourite,' and his dam, 'Young Phoenix,' was by 'Favourite,' with 'George'—'George' was by 'Favourite,' and his dam, 'Lady Grace' was also by 'Favourite,' with 'Chilton'—'Chilton' was by 'Favourite,' and his dam was also by 'Favourite' with 'Minor'—'Minor' was by 'Favourite,' and his dam also was by 'Favourite' with 'Peeress'—she was by 'Favourite,' and her dam also by 'Favourite'; with 'Bright Eyes'—she was by 'Favourite,' and her dam also by 'Favourite' with 'Strawberry'—she was by 'Favourite,' and her dam by 'Favourite'; 'Dandy,' 'Moss Rose,' among the cows, and 'North Star' among the bulls are also of similar descent."

Notwithstanding all the conflicting evidence, it is better always to avoid breeding from near affinities when animals of the same breed and of equal merit are obtainable which are not related. Yet where this is not possible, or where there is some desirable and clearly defined purpose in view, as the fixing and perpetuating of some valuable quality in a particular animal, not common to the breed, and the breeder possesses the knowledge and skill needful to accomplish his purpose, and the animals are perfect in health and development, close breeding may be practised with advantage.

On crossing, Boswell says:—"When I praise the advantages of crossing I would have it clearly understood that it is only to bring together animals not very nearly related, but always of the same breed and blood. It is evident that such crossing as this is not wholly unobjectionable; no one but an avowed and ultra advocate of out-breeding could possibly find any fault with it. The word 'breed,' however, is often used with varying signification. In order, therefore, to be understood it is well right here to designate 'breed' a class of animals possessing a good degree of uniformity growing out of the fact of a common origin and of their having been reared under similar conditions. The method proposed is to unite animals possessing similarity of desirable characteristics, with difference of breed; that

IN-BREEDING.



Favorite.

Color, Roan and White.

A Group of three Illawarra Shorthorn Dairy Cows.

Kate.

Color, Spotted Red and White.

Bred by and the property of Messrs. James Bros., Rose Valley.

Princess.

Color, Roan.

(For further particulars see Appendix.)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

is to say, difference of breed in the sense just specified. From unions based upon this principle, the selections being guided by a skilful judgement and a discriminating tact, we may expect progeny possessing not only a fitting and symmetrical development of the locomotive system, but also an amount and intensity of nervous energy and power unattainable by any other method." This is more noticeable in horse breeding than that of cattle; but generally speaking it applies to all classes of domesticated stock, as the principle laid down is one of broad application, and should never be lost sight of in attempts at improvement in crossing. Another point worthy of special attention is that all crossing, to ensure successful results, should be gentle rather than violent; that is, never couple or mate animals possessing marked dissimilarity, but endeavour to remedy faults and to effect improvement by gradual approaches. Professor White says:—"Harmony of structure and proper balancing of desirable characteristics, an equilibrium of good qualities, can only be obtained by careful and continuous blending of 'blood'—so long as the term 'blood' is used to convey the idea of definite hereditary qualities."

Now, although the terms "in-breeding" and "cross-breeding" have been purposely narrowed down for the object of this article, the subject matter is broad and comprehensive enough to allow breeders of stock in the counties of Camden and St. Vincent almost unlimited scope to exercise their judgment in selecting and coupling or mating their stock with highly satisfactory results, if no other dairy world existed outside those boundaries. This statement is made advisedly, as perhaps the area embraced within these two counties is singular for its variety of soils and climates.

CHAPTER III.

ON THE CALF.

The calf, the progeny of the best acquired knowledge of the farmer, who has mated his cow with a bull of certain quality in order to perpetuate their combined qualities, has been the object of many careful writers, which is only natural seeing the many modifications of its constitution achievable by the art of breeding, and the accidents to which it is subject in the foetal state, and in the process of birth. When a calf is born the cow by some instinctive prompting will invariably lick off the slimy or mucous matter with which it is covered. Some authorities consider it a mistake to allow the cow to do this, and advise taking the calf away immediately it is dropped and cleaning it with straw; others on the other hand affirm that Nature should be allowed to take its course and permit the calf to remain with the cow from one to four days. If, after the calf has been cleaned and has begun to suck—the cow's udder should be carefully attended to—the navel-string should continue to bleed, a ligature ought to be fastened round it very near but not in contact with the belly. If the place at the division of the cord should be unusually sore it ought to be dressed with a little tow, dipped in friar's balsam, made fast with a bandage, which ought to be renewed twice daily, as an inflammatory state of the navel is the cause of many ills in calves.

The first milk, or beastings, possesses an aperient power of clearing away the glutinous faeces which have accumulated in the intestines of the foetus, and which obstruct the due performance of the intestinal functions of the calf, and exert a tendency towards the origination of disease. It also possesses a peculiar nutritive power, and a strongly viscid condition well adapted and evidently intended for the early invigoration and support of the young animal. "Nature," says Marshall, "has evidently prepared milk of a peculiar quality for the infant calf, and this milk is useless in the dairy; it is therefore doubly good management to allow the calf the cow's milk until such milk becomes fit for the dairy, which it usually does in from two to four days." This is generally done in France, Belgium, and Holland; and no person in those countries will taste the milk of a cow until about a week after she has dropped her calf. As a rule, however, every farmer ought to calculate whether the milk of his cows should be given to the calf, the pig, or the human consumer.

The destination of calves, whether for early slaughter, for fattening into fine condition for veal or for the dairy depends entirely on the management of the farmer. Now that the flesh of unfed or but slightly fed calves is prohibited by law, more care is taken in preparing calves for the veal market, and one is seldom confronted with "slink veal" or "staggering Bob" nowadays in our city dining rooms as of yore.

Cow's milk is undoubtedly the natural provision for the rearing of the calf, and contains a large proportion of the necessary nutritive principles, and any calf which is not reared either on the mother or on a food similar and of equally nutritive qualities, must suffer in consequence thereof. But in districts where milk is highly valuable, substitutes for portions of it must be early and constantly given; and among the most approved of these are water-gruel, hay-tea, linseed jelly, crude cod-liver oil, turnips, and carrots boiled; these can be mixed with either skim-milk or hay-tea and given warm. We have also on the market many so-called calf foods, which may or may not be exactly a substitute for even skim milk.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Young calves suffer very much occasionally from diarrhoea. It is common enough in calves of from two to seven weeks old when hand fed; and not infrequently it proves fatal. It is generally occasioned either by undue exposure to the weather, by sudden and injudicious change of food, or by unwholesome food. The faeces, from the very commencement of the disease, contain an excessive proportion of mucus, and they afterwards become fetid and bloody; and the calf ceases to have appetite, staggers in its walk, and rapidly loses flesh. The common and only treatment used to be to give chalk; but this either does not cure the disease, or cures it so slowly as to permit of serious damage to the general health, and perhaps constitution. A mild purgative, such as 2 oz. of castor oil, should be administered; a proper proportion of opium should in every case be given with the chalk. The following treatment is also recommended:—Linseed oil, 1 pint; tincture of opium, 1 oz.; sweet spirits of nitre, 1 oz. A wine-glassful two or three times a day. Castor oil and gruel is often given to relieve the calf, with very good effect.

As has been stated, the symptoms which denote the disease may proceed from various causes, the relaxed state of the mucous coat of the small intestines being amongst the most simple. In severe cases this may proceed from disease of the liver, stomach, or maniplus, and when the diarrhoea is produced by unwholesome food a change of diet will sometimes effect a cure, but if it does not cease, the following is a good astringent and tonic:—Prepared chalk, 2 oz.; gentian root, powdered, 2dr.; opium, powdered, ½dr. This should be well mixed with thick gruel and given once or twice a day as required. If the animal is very young, a smaller dose should be given. Should, however, the liver be affected, calomel in combination with opium is more to be relied on, half a drachm of each being given twice a day. In bad cases it is a good practice to clear out the intestines by a dose of salts, and afterwards give the calomel and opium.

Various circumstances, where economy is a great object, tend to diminish the feeding value of our calf food. This is a serious matter, as when the young animal is allowed to lose its calf flesh the foundation is lost for future successful feeding. Since the introduction of the home separator, now so widely used, the skim milk is completely robbed of its butter fat, hence the falling off in the quality of our calves. An equivalent for this fat can, however, be thus sustained: To two parts of oatmeal add one of wheatmeal, one of ground peas, and one-fourth linseed; this mixture should be steamed and mixed with the milk. Never let the calf suck once, unless it is of special value, when its mother's milk, drawn naturally, is good for it. But with ordinary calves, if they are taken away at once, and their mothers milked by hand, neither suffers from the separation, as would be the case after a few days. The cow becomes attached to her calf the moment it is dropped. This attachment grows on her, and she will fret at weaning time, whether it be longer or shorter after parturition. The calf will rebel after it is used to sucking, and perhaps have to be partially starved before it will drink freely. Smart dairymen can teach the drinking process very rapidly, but all men are not equally smart or handy about such simple things.

A calf, and especially the calf of a dairy cow, can be successfully raised on skim milk, during the period when it requires milk, and probably better than on full milk, provided the milk is in sound wholesome condition. The skim milk should have gradually introduced into it what pollard, cornmeal, or oatmeal the calf can digest. Cod-liver oil is also used with the skim milk with much success. The theory is to replace the fat taken out by the separator.

If the young calf is never suckled she never expects it. The calf, however, should by all means get its mother's milk at first, because

ON THE CALF.

Nature prepared the colostrum as a laxative and if the cow has been on dry food, such as in times of drought, the calf most certainly requires it.

From the time milk ceases to be the main food of the calf until the heifer drops her first calf (at which time, if ever, regardless of age, she becomes a cow) the feeding of the animal should be with a view to nourishment and growth, without the accumulation of too much flesh. When pasturage is good, after the calf is six months old, there can be no better food; if when the grass is short or dry and growth slackens, the pasture should be supplemented with hay. At all times let the food be mainly of the coarser and more bulky kind, as the digestive apparatus needs to be developed and become accustomed to working up large quantities of food. A big belly may result, but no matter.

We have abundant evidence to prove the often repeated statement found herein:—When bull calves have been properly bred and fed on the coastal lands of this State until 6, 9, or 12 months old and then removed to the tableland, where the soil is charged with lime, and climatic conditions are severe, frosts and snowstorms prevailing, on being returned to the coast lands two or three years later, though small in stature and unprepossessing in appearance, they have become the best types as sires.

CHAPTER IV.

MILK FEVER OR DROP AFTER CALVING.

William Youatt, who is one of the best of the old school of writers, says :—" Although parturition is a natural process, it is accompanied by a great deal of febrile excitement. The sudden transferring of powerful and accumulated action from one organ to another—from the womb to the udder—must cause a great deal of constitutional disturbance, as well as liability to local inflammation. The cow, after parturition, is subject to inflammation of some of the parts the functions of which are thus changed ; it is mere local inflammation at first, but the system speedily sympathises, and puerperal fever—or 'drop'—appears. It is called dropping after calving because it follows that process, and one of the prominent symptoms of the complaint is the loss of all power over the motion of the hind limbs, and consequent inability to stand. Cows in high condition are most subject to an attack of puerperal fever. Their excess of condition or state of plethora disposes them to affections of an inflammatory character at all times, and more particularly when the constitution labors under excitement accompanying parturition.

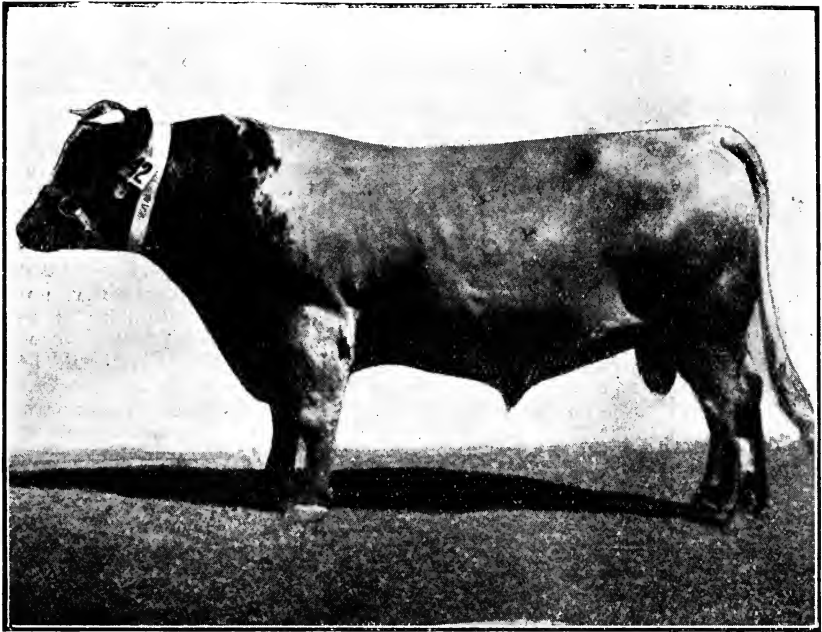
" The disease is an inflammatory one, and must be treated as such, and being thus treated, it is generally subdued without difficulty. The animal should be bled, and the quantity of blood withdrawn should be regulated by that standard so often referred to—that rule without exception—the impression made upon the circulation. The bowels must be opened, or the disease will run its course ; purging once established in an early stage, the fever will, in the majority of cases, rapidly subside, leaving the strength of the constitution untouched.

" That milk fever is sometimes epidemic there is every reason to suppose. The practitioner may, perhaps, be long without a case, but if one occurs in a neighbourhood we have reason to suspect that it will soon be followed by others. The contagious character by which it is so fatally distinguished in the human subject is not, however, so decided ; but this is a subject which well deserves further study."

Although Youatt's theory and medicines were used successfully by some of our dairymen for years, the loss of stock from this disease was considerable. Later on, Dr. Manning's work came under the notice of dairymen. Manning says :—" This fever occurs from the first to the third day after calving ; rarely later than this time. Select breeds and good milkers seem specially liable to attacks from this disorder. The primary trouble in this disease is inflammation of the lining membranes of the womb, extending sometimes to its substance and adjacent parts ; and in some cases involving the bowels themselves. Among its more remote effects are affections of the brain, congestion of the spinal cord, apoplexy, blood poisoning, and death."

Causes.—Injury to the womb in calving ; the retention of the after-birth ; exposure to chill and cold by sudden changes of temperature, poor management, &c., may cause milk fever. At times a contagious character seems to attach to the disease, and many cows of the same herd suffer. It is also regarded as quite certain that a cow having once had the fever will have it with her next calf. Over-feeding as the time of calving approaches is also prominent among the supposed causes of the disease. Authorities differ somewhat as to whether " milk fever" is identical with inflammation of the womb. Some think it is not identical ; others that it is the same disease in different stages, or different degrees of violence. Treatment.—When trouble

MILK FEVER OR DROP AFTER CALVING.



Dairy Bull, Sunnyvale.
Bred by and the Property of Mr. A. F. Warden, Sunny Vale,
Milton, New South Wales.

(For further particulars see Appendix.)



Dairy Cow, Alice.
Bred by and the Property of Messrs. James Bros., Rose Valley,
Gerringong, New South Wales.

(For further particulars see Appendix.)

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

of this character is anticipated, preliminary treatment is strongly recommended for about a week before calving—which may consist of purgatives.

Dr. Manning's theory and medicines, like Youatt's, suited in some cases, but still many cows seemed to die notwithstanding the precautions so clearly put by both these authorities.

About 1892 Professor McConnell, of Wigtown, Scotland, originated a treatment for milk fever, which was said to be followed by much success. It was as follows:—Place the cow on a level floor, put bundles or sacks of straw on either side so as to maintain her in as natural a position as possible. The head must be kept on a level, but not raised above the body, and the uppermost hind leg should be well drawn out so as to save unnecessary straining or bruising. The position must be changed from side to side every two or three hours, and no milk should be taken from the udder until recovery is apparent, and then only very little at short intervals for two or three days. The animal must be kept as quiet as possible. In the very first stage of the disease administer from 7 dr. to 1 oz. of chloral hydrate, according to the size of the animal and the severity of the symptoms, along with from 1 lb. to 2 lb. of treacle. If in two hours there is no improvement, another dose of 1 oz. of chloral hydrate with 1 lb. of treacle should be given, and afterwards repeated every four or six hours, as often as is necessary. It very seldom happens that more than four doses are required, and as soon as the cow can hold her head up steadily the medicine should be stopped and the animal receive well-boiled oatmeal gruel.

Professor McConnell's theory was scarcely known before the Maryland (U.S.A.) Agricultural Experimental Station issued a bulletin upon the Schmidt treatment of milk fever in cattle, claiming 670 recoveries out of 779 cases treated, or over 86 per cent. This treatment assumed the disease to be due to the elaboration of a toxin in the udder. All the apparatus required is a 3 in. funnel, 4 ft. or 5 ft. of ½ in. rubber tubing, and a small glass pipette or milking tube. The following is the method of procedure:—First, dissolve 120 grains of iodide of potash in one quart of water, which has been boiled and allowed to cool to about the temperature of the body. The iodide of potash must be thoroughly dissolved. Second, introduce the funnel and pipette into the ends of the rubber tube and place in a bucket of antiseptic fluid made from either of the three following formulæ:—(1) Creolin, one part; water, thirty parts; (2) thymo-cresol one part, water thirty parts; (3) chloro-napatholeum one part, water thirty parts. Third, milk the udder dry; then place under the cow a piece of oilcloth about a yard square, so that the udder will be about the middle of the cloth. Wash the udder and teats carefully and thoroughly with caustic soap and warm water, rinsing carefully with antiseptic fluid. Fourth, insert the pipette into the end of the teat, and fill the funnel with iodide of potash solution. By passing successively from one teat to another, distribute the solution equally among the four quarters of the udder. Fifth, rub the udder from the teats towards the body, and massage thoroughly, in order to distribute the solution throughout. Sixth, eight or ten hours after the injection, or when recovery is assured, the udder should be carefully milked out, and then bathed with warm water—about 160 deg. Fahr. A second injection is rarely necessary, but if so, it should be done at the end of six or eight hours. If there should be any tendency towards hardness of the udder or "stringiness" of the milk, baths of warm water should be applied every three or four hours until relieved.

The Schmidt theory was practised successfully in the Illawarra and Shoalhaven districts for a season by a few of the farmers. It was,

MILK FEVER OR DROP AFTER CALVING.

however, quickly superseded by what is known as the air treatment. A Mr. Anderson, of Skanderborg, was the first to hit upon the what may be termed the most simple, convenient, effective, and speedy of all the suggested remedies for milk fever in dairy cows.

Just how Mr. Anderson hit on his system is not very clearly understood. Coming as it did before the public immediately after a certain amount of success had been obtained by following up the Schmidt system, very little notice was taken of it for a time, although a few country newspapers in search of "copy" had given the theory a certain amount of publicity. Since then the air treatment has been constantly used in this State.

CHAPTER V.

THE MILK MIRROR.

Before attempting to discuss "Guenon's escutcheon theory" it is as well that we should understand what some authorities in veterinary physiology apparently wish to infer with regard to the much debated theory of milk secretion. They say: "The nervous system of the cow is intimately associated with the production of milk. Very large milkers, as a rule, show a more pronounced nervous temperament than animals of the beef type that secrete very little milk."

According to these authorities, a nerve starts from the spinal cord at the lower part of the loins, and divides in the pelvis into three branches. One branch is distributed among the muscles of the abdomen, while the other two are distributed through the udder. In this latter organ the nerves are divided, so that one branch is associated with the teat, another with the milk-cistern, while the third permeates the lobules and alveoli. As the teats are worked by the hand the nerves become irritated, causing their contraction and the discharge of their contents. Animals noted as large milk producers are usually found to have large arteries and veins connected with the udder. The larger veins extend along the belly towards the heart, while the smaller and more numerous ones are twisted, and extend in no defined direction.

It was by studying these arteries that led Guenon to follow up his escutcheon theory. He discovered that the artery which supplies the udder with blood also nourishes the skin of the escutcheon. Hence there is reason for believing it to be an index of the blood which is being furnished to the udder.

The method has had, comparatively speaking, but a restricted utility, though strongly endorsed by some investigators, who have pronounced that the change in the growth of the hair in the posterior region of the udder is caused by the action of the artery, which is a matter worthy of notice.

We have, therefore, to take seriously into consideration when examining the milk mirror or escutcheon the nervous system as indicated by the vitality observable, caused by the nerve of the spinal cord. In this respect good judges often look for the large protruding eye, the dished forehead, and the spine, without having any knowledge of the cause of such good indications.

The milk mirror or escutcheon has of late years been much discussed by dairymen, and the result, as in most of the other points in connection with dairy cattle, seems to hinge on the grasp or otherwise the view suddenly laid hold of by the parties for or against the theory. In other words, there is a difference of opinion with regard to the practical value of the system of classification and judging of milk cows discovered and developed by Guenon, some being inclined to ridicule it as absurd, others to adopt it implicitly and follow it out in all its details; and still others—and among this class we generally find a very large number of the most sensible and practical judges of stock—who admit that in the main it is correct, though they discredit the practicability of carrying it out so far and so minutely into detail as its author did.

It may be remarked at the outset that the fact that the best of the signs of a great and good milker adopted by Guenon are generally found united with the best forms and marks, almost universally admitted and practised upon by good judges, gives, at least, some plausibility to the system, while the importance of it, if it be correct, is sufficient to demand a careful examination.

THE MILK MIRROR.

Every good judge of a milk cow, for instance, wants to see in her a small, fine head, with short and yellowish horns; a soft, delicate, and close coat of hair; a skin soft and flexible over the rump; broad, well-spread ribs, covered with a loose skin of medium thickness; a broad chest; a long, slender tail; straight hind legs; a large regularly-formed udder, covered with short, close silky hair; four teats of equal size and length, set wide apart; large, projecting lacteal veins, which run along the belly from the udder towards the forelegs, forming a fork at the end, and finally losing themselves in a round cavity; and when these points, or any considerable number of them, are found united in a cow she should be pronounced a good milker. An animal in which these signs are found would rarely fail of having a good 'milk mirror' or escutcheon, on which Guenon, after many years of careful observation and experiment came to lay particular stress; and on the basis of which he built up a system or theory so complicated as to be of little practical value compared with what it might have been had he seen fit to simplify it so as to bring it within the easy comprehension of the farmer. As one means of forming a judgment of milking qualities, however, it must be regarded as very important, since it is unquestionably sustained by facts in a very large majority of cases which have come under the writer's observation.

The milk mirror or escutcheon is formed by the hair above the udder, extending upwards between the thighs, growing in opposite direction from that of other parts of the body. In well-formed mirrors, found only in cows that have arteries which supply the milky glands large and fully developed, it ordinarily begins between the four teats in the middle, and ascends to the vulva, and sometimes even higher, the hair growing upwards. The direction of the hair is subordinate to that of the arteries, for the relation existing between the direction of the hair above the udder and the activity of the milky glands is apparent on a careful examination of all the cases. When the lower part of the mirror is long and broad, with the hair growing from below upwards, and extending well out on the thighs, it indicates that the arteries which supply the milk glands, and which are situated just behind it, are large and capable of conveying much blood, and of great activity to the functions of secretion.

Now, in the bull, the arteries which correspond to the mammary or lacteal arteries of the cow are not so fully developed, and the escutcheons are smaller, shorter, and narrower. Guenon applied the same name, "milk mirror," to these marks in the bull; and the natural inference was that there should exist a correspondence or similarity in the mirror of the bull and the cow which are coupled for the purpose of producing an offspring fit for the dairy—that the mirror in the bull should be of the same class or a better class than that of the cow. However, the word milk mirror, when used in connection with a bull, seems paradoxical.

It is confidently asserted by the advocates of Guenon's method—and with much show of reason—that the very large proportion of cows of bad or indifferent milking qualities, compared with the good, is owing to the mistakes in selecting bulls without the proper marks or points. As to the transmission of the milk mirror, it has been found in many cases that bulls sprung from cows with good mirrors had smaller and more heart-shaped mirrors, spreading out pretty broad upon the thighs.

Pabst, a successful German breeder, says that he used such bulls for several years, and that the milk mirrors were transmitted in the majority of cases in the male progeny, and in nearly every case very large and beautiful mirrors were given to the heifer calves. His inference is that in breeding from cows noted as milkers regard should be had to the form of the mirror of the bull, and the chance of his transmitting it.

If any credit is due to this ingenious method, it may be laid down as a principle in the selection of a bull to get dairy stock that the

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

one possessing the largest and best-developed milk mirror is the best for the purpose, and will be the most likely to get milkers of large quantity and continued flow. But, however careful we may be to select good milkers, and to breed from them with the hope of improvement, it is by no means easy to select such as are capable of transmitting their qualities to their offspring. Hence the importance of selecting milk cows from good breeds and good families, and especially in breeding stock, of selecting carefully both male and female.

Another writer says :—" On the selection of cows by Guenon's system every one has his own views—one will choose by the crumpled horn, the capacious, thin-skinned udder, the large milk veins, and their entrance into the belly, the color and texture of the skin ; while others will judge by the feminine appearance, the wedge shape, the yellow ears, the small head, and the broad muzzle, or by some other favourite method. Yet with all these marks every dairyman will occasionally purchase an animal that deceives him at the milk bucket or the cream can—and she is apt to be the handsome one. Now the questions arise. With none of these modes can we tell just what a cow will do ; with all of them combined we may select a very good cow, and at other times we cannot or may not ; but with the escutcheon marks and other points by which Guenon judged we can very surely tell whether the cow about to be purchased is a good one, as no one yet saw an inferior escutcheon on a first-class dairy cow, or a first-class dairy cow without a high-class escutcheon."

It is, perhaps, unnecessary to say that attention should be paid to the quality of the pasturage and keeping which a cow has previously had, as compared with that to which she is to be subjected. The size of the animal should also be considered with reference to the fertility of the pastures into which she is to be put. Small or medium-sized animals accommodate themselves to ordinary pastures far better than large ones. Without due notice of these simple facts it is difficult the production of a cow by any system.

CHAPTER VI.

MILK TESTING.

In the early eighties the testing of milk became the most difficult problem which the management of butter and cheese factories had to contend with, and where milk was bought for the city supply or condensing purposes similar difficulties had to be overcome with the best appliances then available. Milk was paid for during the eighties according to weight. Therefore, the supplier of rich milk got no more—often less—than he who brought poor milk. This, of course, was understood from the beginning, but it was those who were extracting the cream and adding water to their milk who were giving all the trouble.

When the writer was managing the Wanghope Factory (Jamberoo) during the late eighties, the only appliances in practical use were the lactometer and the cream gauges, or creamometers. When these two appliances were carefully used in combination one with the other much good resulted as a means of detecting adulteration. One well practised in the use of the Quevenue lactometer and the conditions of the cream on the creamometer is not easily deceived in milk. But something more was demanded, when purchasing an article of commercial value such as cream, which is valued according to its butter-fat contents, as was the case at butter and cheese factories.

The first appliance worthy of notice to grapple with this problem was the oil test churn. The samples of cream were taken in tubes, which were afterwards placed in a frame and agitated until the fat was drawn together in a solid mass; the tubes were then immersed in warm water until the fat melted. The proportion of melted fat so obtained was taken as the measure of the butter value of the cream.

Following on the oil test churn came Marchand's lactobutyrometer. It may be described as a chemical and mechanical appliance, inasmuch as acetic acid and ether were mixed with the milk or cream sample before it was revolved in a frame containing hot water. The lactobutyrometer was introduced into New South Wales by the Fresh Food and Ice Company.

Later on we had the De Laval lactocrite and Soxhlet's method, both of which may be termed chemical and mechanical appliances, but as the year 1888 brought forth a host of milk and cream testers of more or less merit working on the centrifugal system—all of which were superseded by Dr. Babcock's invention—it is unnecessary to go into further details of their systems beyond stating that no matter which of the systems may be adopted, honesty of purpose must be the sole guide of those whose duty it is to take samples of either milk or cream for testing purposes.

The chemical analysis of milk or cream is neither complicated nor difficult. A small platina dish is accurately weighed and the weight noted. Into it is now introduced an average sample of milk or cream, and the dish and its contents weighed. By subtracting the weight of the dish from the weight of both, the weight of the sample is found. The dish is placed over a burner until all the water is dried off, leaving a residue. It is this residue which passes under the name of "solids." A last weighing of the dish with the milk or cream residue, less the weight of the dish, gives the weight of the solids, and by a single calculation the percentage is found.

The solids of cream vary according to the method of separation; on the other hand the solids have been found by innumerable analysis to average about 13 per cent., and while the fat varies in the milk from different cows, the solids left after extracting the fat are a very constant quantity, hardly ever falling below 9 per cent. This gives the chemist a positive basis for his calculations, and enables him to

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

state with great certainty whether or not the milk has been watered. If however, foreign matter has been added, it is difficult to arrive at a definite calculation. The fat or oil in milk is determined by dissolving it by means of ether out of the total solids. The residue remaining after the operation being termed "solids not fat."

Prior to the introduction of the Babcock system of milk testing, much of the dissatisfaction was caused by the great difficulty of obtaining an even sample of milk from a can or a tank, as the case may be, of milk delivered at the skimmery. With the De Laval lactocrite the milk measurer was so small that it was with great difficulty that an even sample could be obtained from the average condition of the milk supplied from day to day. The comparative largeness of the Babcock pipette or milk measurer removed to a great extent this difficulty, hence it was quickly adopted throughout the dairy world.

Since the introduction of the home separator, milk testing has gradually decreased and cream testing has become the all-absorbing topic among our creamery and factory men. Approximately there is but one-tenth of the raw product—milk—sent off the farms nowadays to a creamery or butter factory. But this tenth part contains nearly the whole value of the original product. It is, therefore, patent to all commercial minds that this tenth part requires to be more carefully weighed and sampled than the whole milk was subjected to in former days. This subject, the importance of which soon made itself a stumbling block with creamery and factory managers whenever they attempted to make their cream tests tally at the end of a week's working with the results obtained from the churn. The result was that the dishonest tester only gave such tests as were sure to come out under the churn results, and allowed the creamery and factory proprietors to pocket the value of the surplus butter, or distributed it himself pro rata amongst those suppliers whom he thought most deserving of a little assistance. The difference between the milk or cream tests and the actual churn results is termed, as the case may be, whether under or over the tester's estimate—the "over" or "under-run." It matters not how accurate or simple a testing machine may be of itself; unless those who are in charge of the business part of the weighing and sampling, and whose duty is also to conduct the testing of each sample, be strictly speaking honest to the suppliers, there is room for much dishonest dealing, especially in factories and creameries, where the over-run or under-run is not recorded every day for the guidance of the management, whose duty it is to see that justice is done to all suppliers alike.

Dr. Babcock clearly understood before he placed his machine before the factorymen of the dairy world that any method which would be suitable to the demands of analysts and dairymen had to meet at least four requirements, namely: First, it must be rapid in its work and in giving results; second, it must be comparatively easy of manipulation; third, it must not be expensive; fourth, it must be accurate under varying conditions as regards the quality of the cream.

In order to base one's calculations with a view of ascertaining the amount of commercial butter in any given quantity of milk or cream, we must assume that in every 100lb. of commercial butter there is:—Butter fat, 85 per cent.; moisture, 13 per cent.; salt, caseins, &c., 2 per cent. Therefore, working on this basis, 100lb. of butter fat should produce 117 11-17lb. of commercial butter. But in practical working 17½lb. will be found to work out satisfactorily, when added to every 100lb. of butter fat as shown by the Babcock tester. For example: Jones supplies 297lb. of cream to a factory, which tests 40 per cent. butter fat. He should be credited with 143.45lb. of commercial butter, and for which he ought to be paid according to the price of butter the day it was sold, less the manufacturing charges and other incidental expenses which may amount to 1½d. per lb.

MILK TESTING.

The writer does not consider it a part of his duty, in this work, to teach the art and science of working a Babcock milk or cream tester, although one cannot fail to observe the clumsy manner in which both milk and cream are tested in many of our factories and creameries. For example, who has not seen tests being read off from the test tubes with the fat column blurred with either undissolved or burnt casein showing throughout? This should not be so. The fat column should be clear, pure, and well defined.

In submitting the simple cream test chart on the next page to my readers, it is desired they should at once understand it is intended for dairy farmers only who have time to add and multiply so as to arrive at an estimate of any given amount of cream in pounds not mentioned herein.

The following rules should be strictly adhered to in testing dairy cows:—

- 1st. Milk the cow perfectly clean every twelve hours the day previous, and during the test.
- 2nd. Sample as soon as milked, first pouring the milk into another bucket, then taking the sample at once, not allowing the cream to rise to the surface.
- 3rd. For a composite sample dip out a tablespoonful from each milking for not less than eight consecutive milkings just previous to the time of testing.
- 4th. For sample of single milking to be tested take a little less than one quarter of a pint.
- 5th. Add as much corrosive sublimate to each bottle used to hold samples as will lay on the point of a penknife from the point to three-eighths of an inch back from the point. Put the corrosive sublimate in the bottle before putting in any milk. Always shake the bottle with every sample added.
- 6th. To take a composite sample of a herd, pour the milk together and then pour from one can to another until thoroughly mixed; take the sample at once, and should you have a large number of cans, take a sample from each and put them together.
- 7th. The percentage of butter fat found in each milking from any one cow varies so much that a correct average cannot be secured from less than eight consecutive milkings; therefore do not expect accurate tests of a cow or a herd from a composite bottle containing less than eight consecutive milkings.
- 8th. If a dairyman wishes to study the variations in percentage of butter fat that occurs from milking, let him obtain a testing machine and test a cow for eight days in succession; then wait a month and continue the test, and so on for six months. He will find it instructive and profitable.
- 9th. Label every bottle with the date of month, hour of milking, and name of cow.
- 10th. Corrosive sublimate is extremely poisonous. Handle it with great care.
- 11th. It will be revealed that the temperature of the atmosphere and the yield of milk have a more or less connection with each other.
- 12th. To arrive at the average of a dairy herd each cow's milk should be worked out separately each day according to weight of milk and butter fat test. Weekly composite milk tests are only valuable, therefore, as a check on the creamery man when it is found inconvenient to test the herd separately every day.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

SIMPLE CREAM TEST CHART

Allowing 17.50 per cent. for moisture, salt, &c.

W.C.	35		36		37		38		39		40		41		42		43		44		45	
	per cent.	Lbs. C.B.	per cent.	Lbs. C.B.	per cent.	Lbs. C.B.	per cent.	Lbs. C.B.	per cent.	Lbs. C.B.	per cent.	Lbs. C.B.	per cent.	Lbs. C.B.	per cent.	Lbs. C.B.	per cent.	Lbs. C.B.	per cent.	Lbs. C.B.	per cent.	Lbs. C.B.
1	.42	.43	.44	.45	.47	.48	.49	.50	.52	.53	.54	.54	.54	.54	.54	.54	.54	.54	.54	.54	.54	.54
2	.84	.86	.89	.91	.94	.96	.99	1.01	1.04	1.06	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
3	1.26	1.29	1.33	1.37	1.41	1.44	1.48	1.52	1.56	1.60	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64
4	1.68	1.72	1.78	1.82	1.88	1.93	1.98	2.03	2.08	2.13	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18
5	2.10	2.16	2.22	2.28	2.35	2.41	2.48	2.54	2.60	2.67	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.73
6	2.52	2.59	2.67	2.74	2.82	2.89	2.97	3.04	3.12	3.20	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28
7	2.94	3.02	3.11	3.19	3.29	3.38	3.47	3.55	3.64	3.73	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.82
8	3.36	3.45	3.5	3.65	3.76	3.86	3.96	4.06	4.16	4.27	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37
9	3.78	3.88	4.00	4.11	4.23	4.34	4.46	4.57	4.68	4.80	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92
10	4.20	4.32	4.45	4.57	4.70	4.83	4.96	5.08	5.21	5.34	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47
50	21.00	21.60	22.25	22.85	23.50	24.15	24.80	25.40	26.05	26.70	27.35	27.35	27.35	27.35	27.35	27.35	27.35	27.35	27.35	27.35	27.35	27.35
60	25.20	25.92	26.70	27.42	28.20	28.98	29.76	30.48	31.26	32.04	32.82	32.82	32.82	32.82	32.82	32.82	32.82	32.82	32.82	32.82	32.82	32.82
70	29.40	30.24	31.15	31.99	32.90	33.81	34.72	35.56	36.47	37.38	38.29	38.29	38.29	38.29	38.29	38.29	38.29	38.29	38.29	38.29	38.29	38.29
80	33.60	34.56	35.60	36.56	37.60	38.64	39.68	40.64	41.68	42.72	43.76	43.76	43.76	43.76	43.76	43.76	43.76	43.76	43.76	43.76	43.76	43.76
90	37.80	38.88	40.05	41.13	42.30	43.47	44.64	45.72	46.89	48.06	49.23	49.23	49.23	49.23	49.23	49.23	49.23	49.23	49.23	49.23	49.23	49.23
100	42.00	43.20	44.50	45.70	47.00	48.30	49.60	50.80	52.10	53.40	54.70	54.70	54.70	54.70	54.70	54.70	54.70	54.70	54.70	54.70	54.70	54.70

W.C. represents weight of cream in pounds. C.B. represents total quantity commercial butter.

CHAPTER VII.

TUBERCULOSIS.

The relation of micro-organisms to infectious diseases is admitted to be very intimate; and although it may not be quite so universal as some are inclined to assume, it is nevertheless definitely proved to exist as regards some of the infectious maladies affecting man and brutes.

In all investigations of the relative micro-organisms to disease it is necessary to bear in mind, as Koch pointed out, that no observation can be said to be complete, or one should rather say in no instance ought to be accepted, unless it has been satisfactorily proved after the strictest microscopic examination during a long series of experiments.

To show how careful students should be before accepting opinions which are fluently expressed by even experienced cattle men on the subject of tuberculosis, no less an authority than Dr. E. Klein says:—“According to my own experience, extending over a very large number of cases of human miliary tuberculosis and tuberculosis of cattle I cannot for a moment accept the statement that the bacilli found in the two affections are identical, for I find that in the two diseases their morphological characters are conspicuously larger than those of the tuberculosis of cattle, and in many instances more regularly granular.”

When Dr. Klein made this statement he held the important position of Lecturer on General Anatomy and Physiology in the Medical School of St. Bartholomew's Hospital, London. But it is not my purpose to discuss points in connection with tuberculosis outside the dairymen's sphere of observation which embraces causes and effect from that standpoint. So far as our history goes, tuberculosis was practically unknown among the dairy herds of the Camden and West Camden districts forty years ago. It almost goes without saying that it was introduced into those districts through the introduction of the fashionable breeds of beef cattle in the seventies and eighties; and was subsequently disseminated by persons obtaining virus for inoculation purposes during occasional outbreaks of contagious pleuropneumonia. That there may have been isolated cases in the Illawarra and Shoalhaven Valley districts prior to 1870 no one will dispute; but, if so, no one seems to have noticed it, and most dairymen prior to that date, and for many years afterwards, slaughtered their own beef, and as a rule the boys on the farm are very observant when slaughtering cattle for their own consumption.

From 1850 to 1870 Sydney doctors constantly recommended their consumptive patients to visit the South Coast in search of cows' milk and health. Drs. Tarrant, Terry, and Beath, whose professional experience, taken in the aggregate, extends over thirty years (and living as they did in the midst of the dairying centres, their combined experience is worth much), say:—“Human tuberculosis is very rare indeed on the South Coast.” This bears out the opinion once expressed by a well-known Sydney medical man to the writer, viz.:—“Many thousands of children die annually from the want of milk as it is taken from the cows, but very few indeed die from the effects of such milk.”

Everyone knows, without being told by a scientist that if the system is in a position to assimilate plenty of rich milk there is very little danger of being attacked by tuberculosis, provided the milk is forthcoming. In the “Elements of Medicine,” Dr. Carter says:—“In order that the growth and development of the tubercular virus may

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

take place, a predisposition on the part of the individual attacked is necessary, without which tubercular disease does not occur. This predisposition may be either general or local. In general terms, anything which reduces vitality may operate as a general predisposing cause of tubercle. But, in this connection, there are two inherited diathetic conditions which are of especial importance. The one, diathesis (scrofulous or strumous), is characterised by slow nutrition and general feeble powers of resistance on the part of the tissues. The second diathetic condition (sometimes called tubercular) is characterised by premature rapid growth, out of proportion to nutrition, and associated with a special instability of the body tissues. As a local predisposition it would appear that any antecedent disease may act in this way, in so far as it lowers the standard of nutrition of a part."

Speaking of the cause of tuberculosis, Dr. Sims Woodhead, M.D., Edin., says :—" There seems in most cases to be, first, a weakened condition, an impaired power of resistance of the epithelial cells lining the small bronchi ; the smaller air passages, and the air vesicles making up the spongy tissue of the lung ; the bacilli in the air and dust then finding their way to a surface already weakened and specially prepared, as it were, for their reception, recommence their parasitic life, multiply and make their way further into the tissues, whence they set up the change associated with tubercular disease. It is evident from all this, therefore, that much work still lies ready to our hand in connection with the spread of tubercule, and that if we could only persuade people to look upon tubercle as an infectious disease similar in character to scarlet fever, though not so rapidly developed, much would have been done to prevent its spread, and a great advance in preventive medicine would have been made."

It is plain enough, from the foregoing remarks, that what is most necessary as a means of prevention in the case of animal tuberculosis are as follows :—Cleanliness, good food, and plenty of fresh air. Now, under all the conditions of city life, it does not seem possible to place a large percentage of the children raised in cities in a favourable condition to resist disease ; hence it is that the country milk supply is held up to the world as the cause of all the ills the flesh is heir to on this mundane sphere ; whereas it is traceable to other causes.

Shumway says :—" The slower process of tuberculosis as compared with other infectious diseases has aided in the general indifference with which it has been regarded. In its acute form it often runs its course in a few weeks, but its usual manifestation is of a chronic and dilatory character, often lasting for years. The disease attacks many of the organs of the body, and it often makes considerable progress in one organ before others are involved. This results in great difficulty in recognising its presence in its earlier stages, or in identifying it where some difficulty or disease is indicated. It is in such cases that the ' tuberculin test' is so pronounced and certain. Unfortunately, however, we have no guarantee that the tuberculin poison, once in the system, does not remain there, much to the detriment of the animal. Few scientists, one might venture to say, would care to eat the flesh of a beast after the tuberculin has been injected, whether it reacted or not, owing to the suspicious nature of tuberculin."

Nocard says :—" From a clinical point of view two great divisions are pulmonary tuberculosis and abdominal tuberculosis. From an anatomical point of view three chief divisions are made : (1) Tuberculosis of the organs ; (2) tuberculosis of the serous membranes ; (3) tuberculosis of the lymphatic glands. In most cases, undoubtedly, these three forms co-exist in the same subject, but still it is quite common to see animals succumb, either to intense glandular tuberculosis or to enormous tuberculous growths of the pleura or peritoneum, without the process having attacked the neighbouring viscera. It would almost seem as if there were three varieties of the bacillus

TUBERCULOSIS.

of 'Koch,' each with a preference for one particular tissue or culture medium."

We have seen by the evidence given us by these eminent authorities that a medium must first be obtained before the bacillus can form a colony within the animal. Of course, there are many strong arguments used in favour of hereditary taint. Yet, according to Professor Bang's theory "no young animal is born with the disease in its system." The most, therefore, that can be said on that point is that the animal is born with a predisposition to the disease, which, under ordinary conditions amounts to the very same thing. If, as Dr. Brush, of Philadelphia, says, "The cow is the wet nurse of consumption" and shows the connection by the following facts:—"Scrofulous females in the human race usually secrete abundance of milk, because in scrofula there is an unusual tendency to glandular enlargements and activity. As the mammary is the highest type of glandular structure, it is stimulated to increased action. A scrofulous cow is usually the largest milker, and the closest kind of consanguinity has been practised by cattle breeders, with the object of producing a scrofulous animal, not because she is scrofulous, but because the particular form she represents are the largest yielders of milk. We find, too, that consanguineous breeding has been alleged as one of the causes of tuberculosis in the human race, where it can never be conducted with so close and intimate blood relations as in the dairy animals."

If in-and-in or consanguineous breeding is a cause of tuberculosis just to the extent that such breeding produces animals which will yield large supplies of milk, one might, if it were profitable, get over the difficulty by keeping scrub cows; but change of climatic conditions will bring about immunity to a great extent. On this important point we have the opinion of a gentleman not unknown to us here in Australia, Dr. Crookshank. He says:—"Immunity may be acquired by acclimatisation, for the inhabitants of tropical climates are less susceptible to the diseases of the country—malarial fever, for instance—than strangers." He further states:—"It is difficult to conceive that the leucocytes in the blood and tissues of field mice are differently constituted from those of the home mouse, so that they form an effectual barrier in the one case, though so readily destroyed in the other."

Now, without attempting to dive deeply into the cell life in the blood of animals, it may not be out of place to state one's experience in dairy heifers which were taken from the same mob, and which were bred on the same identical lines with others on the coast, and sent away to the tableland. Those animals left on the coast in the course of time nearly all died from tuberculosis, whereas of those taken to the tableland not 2 per cent. of them suffered from that disease. They were all got by a bull that contracted tuberculosis and died or was otherwise destroyed. The climatic conditions undoubtedly in this instance had the desired effect of altering the condition of the leucocytes, making them more active and vigorous in resisting disease.

Speaking generally, tuberculosis is a compound name for all the pathological changes caused by tubercle bacilli. It is a contagious disease which occurs both in man and in the lower animal, pursues its course slowly, and shows itself in the formation of a larger or smaller quantity of nodules, called tubercles. Among domestic animals it principally attacks cattle and pigs, more seldom dogs, horses, and cats, very rarely sheep and goats. The tuberculosis which has been observed at different times in poultry appears to be of a special kind, inasmuch as the tuberculosis of mankind and mammals seems to be only capable with difficulty of being conveyed to poultry, as also that poultry tuberculosis does not attack mammals. Wild animals in a natural state are practically free from the disease, but easily contract it in a state of domestication or captivity.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

At what age do cows contract tuberculosis, may be asked, and experience goes to show mostly during their growth. Young cows have least power of resistance to the disease, and are, therefore, most easily infected, but as the animal becomes older and has more opportunities of infection, in the same proportion does the disease develop. Hence it arises that in post-mortem examinations one often finds full-grown cows more tuberculous than young calves. Cows, after a long season's milking, especially after dropping the second or third calf, are particularly liable to tubercle. First and foremost, cows, then bulls, then bullocks are more frequently affected. In the case of cows, of course, a multitude of circumstances are at work reducing their power of resistance to the disease, as for instance unnatural feeding, too highly forced milk production, want of exercise in the fresh air, &c. If the bulls are put among the cows of a tubercular herd they as a rule contract tuberculosis.

As regards breed, it is frequently stated that this or that breed is more susceptible than another. But this all depends on the degree of production and the care and attention to which any breed of cattle are subjected. The reason why good animals are so prone to the malady is not to be sought in any greater susceptibility to tuberculosis than any particular breed possesses so much as their surroundings, being more crowded together, while under a very severe strain of milk production.

Hereditary tuberculosis has in ordinary parlance two meanings, i.e., inherited infection and inherited susceptibility. It is important to separate each from the other. Infection directly inherited is somewhat rare, according to Professor Bang; inherited susceptibility, on the other hand, is more common. "It is certain," says Bang, "that an animal born with tuberculosis is somewhat of a rarity; but still cases do actually occur, and perhaps more frequently than is believed."

That tuberculosis in mankind is hereditary has been a deeply-rooted conviction which still to a great extent obtains. It has been analogously assumed that tuberculosis in cattle was hereditary. Both sire and dam are considered capable of conveying the disease to the young one, but the influence of the dam is, of course, incomparably greater. There are instances on record of bulls suffering from tuberculosis in the testicles producing healthy calves. Then comes the question of hereditary susceptibility to the disease. All high-class dairy cattle by nature are susceptible to tuberculosis, for once their systems are out of order, which is most difficult to avoid in the process of a few years of high butter yielding, and an adequate supply of tubercle bacilli being available, they always get the disease. Of course, there are varying degrees of susceptibility. Hence some cows resist the disease for a greater length of time than others, while some resist it till they are past the milking stage, whereas there are cows that offer an excellent field for tuberculosis and are struck down on their second or third calf from an attack of but a few months' duration; others offer a stubborn resistance to it, and are able not infrequently to confine it to a single lymph gland, which required an observant eye to detect.

Apart from the, so to speak, innate disposition to tuberculosis present in all good dairy cattle, one may also speak of acquired susceptibility to disease; and the reasons for this might be looked for in the defective feeding of calves on separated milk some years ago, and prior to the general adoption of the home separator, and even in the defective feeding of calves under the present systems, where the milk is sent off the farm for treatment, and where cheese is manufactured.

The aim of any rational dairy farmer in calf raising is to make the animals as good milkers as possible. In this very often very little judgment and consideration is shown, and the result is partially-

TUBERCULOSIS.

developed stock to begin the battle for existence. The powerful milk organs require a deal of feeding, and owing to this the body as a whole must be sustained in healthy growth. If not, the power of resistance will be considerably weakened, and the animal thus becomes exposed to the risk of infection from the tubercle bacilli.

To retain the good points of a herd an intensive in-breeding is often resorted to, and is certainly necessary to a great extent. But where our dairymen often make a mistake is in taking for granted a characteristic for an absolute quality, viz., the wedge shape of the fore-quarter of a dairy cow. Judges only too often look for the sharp, thin shoulder as being a true sign of quality, forgetting that it is merely the result of generations of high milk records on the part of ancestors.

As explained in another article on breeding, the wedge-shape of the forequarter of a dairy cow is the result of the great energy that has been forced into the stomach and udder, or the excessive use of one part of the animal as against, or at the expense of, another. Therefore, the very sharp shoulder is to be avoided as much as possible as being in direct opposition to lung power, which should be cultivated. It is here where change of climate and soil comes to the assistance of those who are honestly endeavouring to arrive at a standard of type by a system of judicious consanguineous breeding.

No doubt whatever, tuberculosis once established in a dairy herd is a most serious trouble to be wrestled with and one that requires a considerable amount of careful handling. On the other hand, far too much fuss has been created by the action of intermeddling officia's who have had no practical experience among farm stock, especially in connection with the milk and dairy produce trade. Nocard says :—
“ In my experience I have never found the milk virulent when the udder was free from tuberculosis lesions ; and, tuberculosis of the udder is comparatively rare, for out of fifty-four cows which had been seized for general tuberculosis, which I studied especially with this object in view, only three had tuberculosis of the udder.” No one who has studied the literature of tubercular disease would for a moment doubt the honest sincerity and far-reaching influence of Nocard's investigations. Yet he goes to show that when milk is pooled, as is the case with herds, the influence of the bacilli is very limited. He further adds:—“(1.) That the milk of a tuberculous cow is only virulent when the udder is the seat of tuberculous lesions. (2.) That the infection of a virulent milk is only dangerous when the milk contains a great number of bacilli and is infested in considerable quantities. (3.) That practically the danger from infection of raw milk only exists for persons who use it as their sole or principal food ; that is to say, for young children and certain invalids. (4.) That, to avoid all danger, it is sufficient to bring the milk to a boil before it is consumed.”

It has been alleged that the boiling of milk renders it indigestible, and causes it to lose much of its nutritive value. This is absolutely untrue. All doctors who have made a study of the question are now agreed that children digest boiled milk just as well, if not better, than raw milk. Moreover, the substitution of boiled milk for raw not only has the advantage of abolishing all danger from tuberculosis, but it also has a marked effect in diminishing the number of deaths and illness due to intestinal affections which are so common during the hot weather. It will thus be seen that every dairy farmer should pay particular attention to the raising and feeding of his dairy stock by the application of common sense rules of management. If fewer stock were raised, and those few better tended and cared for, the outcry about disease would cease.

Dr. Schweinitz, writing on the serum treatment of tuberculosis with anti-tuberculosis toxin, says :—“ Although we occasionally find in the

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

literature reports of cases treated with tuberculin as originally prepared by Koch, and in many instances improvement has been recorded, its use as a therapeutic agent has, except in special cases, been discarded. Its value, on the other hand, for the early diagnosis of tuberculosis in animals is generally recognised. Following the careful methods proposed by Dr. Trudeau, tuberculin offers also a means of positive diagnosis in man, and of indicating whether the disease, after treatment, has been arrested or cured.

“When tuberculin failed to give satisfactory results as a curative agent, attention was quickly directed to the preparation of a serum on the same principle as the diphtheria anti-toxic serum. Maragliano, Babes, Behring, and others prepared such material for the treatment of tuberculosis by infecting horses with tuberculin alone, or a combination of tuberculin and virulent cultures. After a long-continued infection of the animals, the serum obtained was claimed to have anti-toxic properties, and when this serum was injected subcutaneously into tuberculous animals, together with a dose of tuberculin, the fatal effects or characteristic rise of temperature from the latter was counteracted. The strength of the serum was based upon the quantity necessary to prevent a tuberculous reaction. This method, however, did not fulfil all the conditions. In the first place, as tuberculin is prepared from the cultures of the germ, it is submitted to such a temperature that some of the products of the germ life are changed or decomposed, and hence tuberculin as used does not represent the poisons of the tubercle germ as they are actually found in the animals suffering from this disease. Consequently, a serum which counteracts the fever-producing properties of tuberculin does not necessarily exert a beneficial influence upon all the phases of the disease.”

Dr. Schweinitz further states :—“Assuming that while it may not be possible to establish a perfect artificial immunity in animals, but that the disease may be checked by reinforcing the natural resistance which is always present, we have endeavoured to secure, in a slightly different way from the one above described, a serum useful for treating tuberculosis. In the first place, as reported to the Medical Society some time ago, we had found that if an originally virulent tubercle bacillus was cultivated for many generations upon artificial media, while it did not lose the property of producing active poisons when so cultivated, it did lose the property of producing tuberculosis in animals when the latter was injected. Furthermore, such animals as guinea pigs after a time possessed a very marked resistance to tuberculosis when they were subjected to an inoculation with virulent tubercle bacilli that would cause disease in six months.”

Whether further application of the serum treatment in its present form will continue to prove beneficial and give better results ; whether this must be materially modified, cannot be stated positively. The results obtained certainly show that the efforts are properly directed. True, many individuals hold that on account of the slight evidence that can be found in the clinical history of tuberculosis, there is little to lead us to believe that immunity ever occurs in the natural course of this disease. Yet the experiments of Dr. Trudeau and Schweinitz certainly show that artificial immunity is possible. In the meantime it behoves every dairyman to keep a strict watch on his stock, and note every symptom that may indicate the presence of the disease. Immediate destruction is the safest plan.

The condition which favours tuberculosis is first and foremost excessive milk production, and this is often rendered hereditary by close in-breeding and breeding in line from predisposed animals. Again, whatever undermines the health or stamina, such as breeding and heavy milking before maturity, breeding from old and debilitated animals, insufficient rations, and ill-balanced ration, such as brewers' grains or similar foods, possessed of but one or two constituents which stimulate the milk production only ; ill-health, local inflamma-

TUBERCULOSIS.

tion in the air passages, lack of ventilation, constant stabling in dark, damp, undrained stables and wet soils, greatly favour the reception of the bacillus.

The hereditary transmission of tuberculosis has long since been recognised, and until recently accorded a role much more important than our most modern writers admit. Various conditions militate against its occurrence; the foetus is essentially a carnivorous animal, living on the secretions of its mother and not on the direct products of the vegetable kingdom. It has, therefore, that measure of resistance which inheres in the flesh feeding as compared with the vegetable feeding animal. It may be infected through the semen of the sire, but the rule appears to be that the ovum thus early affected rarely attains to its full intra uterine development. It may be affected from the tuberculous generative organs of the dam, but here again abortion is liable to cut short the existence of the embryo. Although there has been cases recorded where a calf, just born, on dissection was found to be tuberculous, the infrequency of such an occurrence may, however, be inferred from the fact that in thousands of cases not one calf slaughtered is found to be affected. The disease may be there, nevertheless.

The strict observance of sanitary conditions, good supply of wholesome food, carefully avoiding enormous yields of milk and butter for show and sale purposes, breeding and rearing animals with plenty of lung room, discarding any animal, however bred, when signs of tuberculosis have made their appearance, will go far to eradicate the disease. It should be treated as a plague and treated as such until it has disappeared from the herd.

CHAPTER VIII.

ABORTION IN COWS.

Professor Axe says :—" Isolated cases of abortion are ever occurring here and there in various parts of the country at different times, without any casual connection whatever one with the other. Cases of this description are usually the result of accident, and in their widely scattered and disconnected existence we recognise the disorder in what is known as the sporadic form. On other occasions it is met with under entirely different circumstances. It may, for example, appear and run through the whole or part of a particular herd, or in several centres in a particular locality, without ever extending itself beyond a certain more or less well defined area. In such outbreaks case succeeds case at varying intervals of days, weeks, or months until the greater number, or all the pregnant cows in the invaded part have aborted. When the malady comports itself in this destructive manner it is described as enzootic, and may be regarded as having its origin in some condition peculiar to the farm or district in which it appears.

Examples of this local prevalence are frequently found in low-lying districts, where ergotized grasses are wont to abound, and operate on many or all the cows alike that may have access to them. Where the disease pervades different districts, and, as oftentimes occurs, spreads widely over a district without regard to physical conformation, geological formation, or climatic influences, seizing large numbers of cows at or about the same time, regardless of age, condition, or management, the disorder is then expressed by the term epizootic abortion, and is assumed to have its origin in some cause operating throughout the district, and, probably, at times influencing all pregnant animals to a greater or less extent—particularly the cow.

All animals, both wild and domesticated, are liable to abort at any period of gestation. This liability, however, differs very considerably in different species. Of our domesticated creatures the cow is pre-eminently susceptible, and appears to be influenced by causes to which the mare and all other of our domesticated animals show an open indifference. On what special influence this exalted tendency to abort depends, is a most important question, and at the same time one not easily answered. Having regard to the vast losses sustained by agriculturists year by year, and the manifest increasing prevalence of the disorder, it behoves owners of stock no less than veterinarians to lend their aid in bringing about a better understanding of the causes on which this difference rests.

It is important to bear in mind that in a wild and natural state abortion in cows, and indeed other descriptions of stock, is of rare occurrence, excepting as the result of violence or accidental conditions. Moreover, its accidental occurrence in one animal is seldom followed by the disastrous spreading consequences so common in our more refined herds. When considered in reference to the causation of abortion these facts are of the highest importance in directing injury, nor can it be overlooked that their tendency is to challenge the artificial refinements of breeding, feeding, and general management under domestication. It may be noted that in the ox tribe, however, more than in any other under domestication, the practice of close and in-breeding has been indulged, and while the coveted qualities of rapid growth and maturity, combined with the higher milking qualities, have been forced to a higher state of perfection, the infirmities of the constitution have also been multiplied and intensified.

ABORTION IN COWS.

There is good reason to believe that prolonged lactation during pregnancy is, in young stock especially, a fruitful source of the mishap in question. It is the custom with many farmers and dairymen to milk pregnant cows through nearly the whole period of gestation. The intimate physiological relationship existing between the mammary gland and the uterus, is either not understood by them or altogether lost sight of, and the debilitating influence of lactation under advanced pregnancy is altogether disregarded.

A common observation will suffice to show how forcibly and deliberately these two organs act and react on each other. When after calving the foetus is allowed to suck the dam, the latter is now and again observed to pass through a brief paroxysm of uterine contraction or straining. In a less degree this uterine excitement is also induced by the hand when cows of an excitable temperament, far advanced in pregnancy, are being milked. It cannot be insisted that this exalted sensibility of the uterus to outside impression belongs to all cows alike, nor can it be said to endure in many after the first or second pregnancy; nevertheless, our experience enables us to place it in the rank of occasional causes of abortion.

The double tax demanded by the foetus on the one hand, by the milk pail on the other, is, when continued over a certain period, a pernicious burden under which many cows fail to carry the fruits of conception to the final stage. It is no argument in favour of this theory, however, to say that prolonged lactation is the sole cause where, as elsewhere shown, a single case of abortion is sufficient to upset an entire herd.

The causes of abortion are not only numerous, but diverse both in regard to their nature and mode of action. Sometimes they are very obscure, and difficult to trace to their source; at others they are easily recognised and understood, while some are so subtle and inscrutable as to evade the most searching inquiry into their origin. It frequently happens that without any appreciable departure from a long established system of general management and care, and without any deviation from sound principles of hygiene and sanitation, without any fresh importation of stock, and in the entire absence of sickness from the herd, abortion appears in its worst form, and baffles the skill of the most earnest and painstaking investigator to throw light on the causation of the disorder.

Abortion in bovines is pretty generally admitted to be more frequent, and the consequences much more serious, than they were in early times, and any inquiry having for its object an elucidation of the cause of the disorder must embrace these facts, and we must endeavour to formulate the conditions on which they depend.

As already stated, the causes by which abortion is induced are very numerous and various. A large number of them have their origin, and exercise their influence, outside the body, while others, although originating from without, require to be introduced into the economy, in one direction or another, before any untoward result can arise. On the other hand, many conditions conducive to the accident, and which may either be of a temporary or permanent character, arise within the body of the animal itself, and it may be in the embryo which it carries and nurtures, through the influence of the bull. We recognise, therefore, in the category of causes, some that are extraneous, and others that are intrinsic. Of the latter some are parental, others foetal. It may be also said that the foetal membranes or placentae, which are deciduous and belong as much to the foetus as the dam, are sometimes the seat and origin of the disturbing cause. Of the external causes, not a few have their origin in force applied to the body of the pregnant cow, which takes various shapes and is applied in many directions.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Among the extraneous causes of abortion none are so mischievous and consequently much to be dreaded as the germs of infection and contagious disease. Of these such as are attended with coughing, straining, and restlessness, or which assail the uterus itself, are most to be feared. The influence of the male in the production of abortion appears to have been well established. Many outbreaks of an enzootic character have been well known to arise from the debility and loss of prolific virtues due to excessive usage at the stud. Excessive disproportion of the bull as compared with the cow is also said to have the effect of cutting short the term of gestation.

Is it contagious? On this point there is a variety of opinion; and this difference of opinion is quite consistent with the present state of our knowledge, and until the question has been submitted to an exhaustive experimental inquiry we fear that no definite conclusion can be arrived at. That the disease is capable of being propagated by the cohabitation of pregnant cows with others who have recently aborted there does not appear to be any reason to doubt, and on this fact alone many are satisfied to rest its contagious nature. That a causal connection exists between such animals few will dispute, but there is nothing to show that the extension of the malady under such circumstances is a more necessary consequence of a contagious element than the sickness we sometimes experience from a disgusting sight or offensive odour is the necessary consequence of an emetic. In both cases the result is quite capable of being explained by reference to impressions operating through the sensorial centres, and exciting what is commonly termed sympathetic action.

Notwithstanding, however, this explanation of the propagation of abortion, the existence of a specific infection or contagion as a factor in the process is by no means rendered impossible, as one fact in the history of this peculiar affection is generally admitted, viz., when one cow in a herd discharges her ovum other cases very frequently follow, and in numerous instances, even to the extent of sooner or later passing through the entire stock. There is nothing in this, however, to establish its contagious nature, for many diseases well known to be destitute of contagious properties will occasionally prevail very extensively among various kinds of animals, where such animals are usually exposed to the same influences.

In conclusion, if we carefully examine the leading features pertain to the origin, propagation and development of contagious disorders we find:—1. That they owe their origin to a morbid element, whose existence can be clearly shown by experimentation. 2. That in order to exercise its specific action it must enter the blood and tissues of the body. 3. That a more or less period elapses—period of inoculation—between the introduction of the contagion into the body and the manifestation of disease. 4. That when in the blood it reproduces its kind. 5. That during the elimination of the poison, fever is well pronounced. 6. That one attack affords a more or less enduring protection or immunity from future infection.

Of abortion it may be said:—1. That it is not known to be identified with matter possessing contagious properties. 2. That it has no fixed period of incubation. 3. That except in occasional instances it is unattended with fever. 4. That one attack predisposes to a second, and is usually followed by several in succession. It may further be stated that in none other of our domesticated animals than the cow is contagion ever suspected.

Chabert, in his veterinary instruction, says:—"Abortion sometimes becomes remarkably frequent, and even appears to assume an epizootic or epidemic character in particular districts, or upon particular farms. There are only too frequently instances of a farmer, who unwittingly introduced an abortion habit among his cows by the purchase of a

ABORTION IN COWS.

strange cow at a sale of cattle, and who witnessed the transmission of the habit, apparently from that one animal, to all his breeding of cows, during the long period of thirty years, who could discover nothing in neither the previous condition or the current treatment of any of his cows to indicate a predisposition to the habit; who sold off cows that had aborted, purchased seemingly sound cows in their stead, rebuilt his cow house, altered the whole economy of his live stock, repeatedly changed the bull, and tried every other expedient he could think of to put an end to the pest; and who was baffled at every step, and tortured to see the abortive habit as prevalent and powerful as ever, until at last he sold his whole herd, and introduced an entirely different set of animals, altogether free from sympathy with any individual of his former set of cows. These instances at first sight serve to indicate the existence of some contagious or infectious virus in the cow's abortion; but when more carefully considered they show the disorder to be propagated rather by the sympathies of a delicate smell, by the keen power of an irritable imagination, or by some influence of an equally subtle nature, and altogether peculiar to the cow. These views, although not demonstrable nor even tolerably certain, are very far from being unphilosophical, and they possess quite as much force as any plausible theory hitherto suggested. The transmission, however, of the abortive habit in the seemingly epizootic form is confessedly an obscure subject—possibly yet untraced to its real cause, and certainly ill combated by any remedies yet devised.

A revised leaflet on the subject of epizootic abortion in cows has been issued by the Royal Agricultural Society of England, which urges upon stock owners in whose herds abortion occurs from time to time in the epizootic form, to deal with the disorder as they would with the most virulent cattle disease or other contagious malady, i.e., by isolation of the cows which have suffered, by burning the expelled foetus and membranes, or burning them in quicklime, and by regular and thorough cleansing and disinfection of the premises, and also the cows, both healthy and diseased, which are kept in the sheds.

It should not be forgotten that a thorough washing with water is an essential part of any system of disinfection, after which a strong solution of blue vitriol, sulphate of copper, or carbolic acid—one part to fifty parts, may be used.

Disinfectants are of various kinds—carbolic acid and other tar products, sulphate of copper, and corrosive sublimate (mercury chloride)—are in common use for this purpose, and are obtainable almost anywhere.

For the cows, the disinfecting solution should be applied to the under parts of the tail, the arms, vulva, and parts below.

Professor Norcard, of whom it may be said there is no better authority, considers that the regular use of the following will eradicate abortion from a herd:—

Corrosive sublimate, $2\frac{1}{2}$ drachms.
Hydrochloric acid, $2\frac{1}{2}$ oz.
Rain or distilled water, 2 gallons.

During the first season of this treatment, he remarks, only a moderate amount of improvement is to be expected, but after the next season abortion will cease entirely, which statement is its own recommendation.

It will be seen from these remarks that once abortion appears in a herd, immediate and regular constant action must be resorted to with the means at the farmer's disposal. No quarter must be given to the cause of the trouble. Cleanliness and the constant use of disinfectants inside and outside the affected parts seem to be the most important items.

CHAPTER IX.

BLACKLEG.

Blackleg, otherwise known as black quarter, quarter ill, or symptomatis anthrax, is a disease found in cattle ranging from six months to two years old. The losses from this disease in the dairying districts of the colony make it at once an important disease of animals, owing generally to the suddenness of its outbreak. As its geographical distribution does not depend on climatic conditions, it may be found wherever a previous case has existed. But as a rule it develops rapidly, and if not checked it will quickly carry off all the calves in the flock.

There have been repeated outbreaks of this disease in the Illawarra and the Shoalhaven Valley districts, extending over a period of seventy years (since 1834). But as soon as it made its appearance inoculation with the correct species of garlic was resorted to, and invariably the disease would disappear. At one time in these districts no dairyman was without a supply of the common remedies necessary for doctoring his stock; and no neighbourhood was without its local stock doctor. Microbes, ferments, and moulds were not studied in those days; nevertheless there were healthy herds and plenty to eat and drink for man and beast.

However, science had to be introduced as a means of exterminating blackleg from the farms. Three French scientists—Arloing, Cornevin, and Thomas—were the first to recommend preventive vaccination against blackleg, and their method, which consists in injecting into each animal two doses of highly attenuated blackleg virus, is still used in many farming and dairying districts. But the process requires that each animal be treated twice, with an interval of ten days between the two inoculations. It would appear that this system of treatment was very expensive, as the operation had to be exclusively performed by veterinarians. It therefore became unpopular among the large cattle owners of America, to whom we are indebted for the drastic change that followed. The American authorities at once decided to prepare a single vaccin, somewhat similar to the one used in France, and to place it directly in the hands of the cattle owners, with such instructions as would enable them to apply it without the assistance of professional experts. This probably was the first time in the history of preventive vaccination that the hypodermic syringe and attenuated virus had been placed in the hands of a cattle raiser. The results, however, prove that an intelligent cattleman can be trusted with the most delicate experiments, provided the information for his guidance is based on sound principles.

Scientists tell us that the germ which causes blackleg much resembles the malignant edema bacillus, but it is more slender, is often found in pairs, and never in chains like the latter. It frequently forms filaments. It may be differentiated from anthrax by the fact that in animals dead from blackleg the spleen and other organs are not noticeably affected. There may be some reddening of the intestines, but the disease is usually located in the muscles and subcutaneous connective tissue of the thigh and inguinal regions. If the infection takes place in the mouth or throat the disease will be localised in the anterior portion of the body. The animal becomes suddenly lame, usually in one leg. There is a rapid rise of temperature, and in the respiratory speed. The animal gets down, and dies in a few hours. The affected leg is much swollen. The abdomen contains much gas.

BLACKLEG.

and the tissues have a strong butyric odour. The best and fattest calyces are the ones which usually become affected. If the animal is skinned it will have the appearance of having been beaten with a club. The flesh, in addition to its highly inflamed appearance, will have spots here and there of free blood which has escaped from the vessels. Despite what science has done for us in this disease, every farmer should have in a secure nook on his farm a few plants of garlic. It may be an old preventive against blackleg, but it is a very good one indeed.

ON SELECTION.

Darwin, in his introduction to "Natural Selection," says:—"From a remote period, in all parts of the world, man has subjected many animals and plants to domestication or culture. Man has no power of altering the absolute conditions of life; he cannot change the climate of any country; he adds no new element to the soil; but he can remove an animal or plant from one climate or soil to another, and give it food on which it did not subsist in its natural state.

"It is an error to speak of man 'tampering with Nature' and causing variability. If organic beings had not possessed an inherent tendency to vary, man could have done nothing. He unintentionally exposes his animals and plants to various conditions of life, and variability supervenes, which he cannot even prevent or check. Man, therefore, may be said to have been trying an experiment on a gigantic scale, on the lines which Nature during the long lapse of time has incessantly tried. Hence it follows that the principles of domestication are important for us; and the main result is that organic beings thus treated have varied largely, and the variations have been inherited. This has apparently been one chief cause of the belief long held by some few naturalists that species in a state of nature undergo change. Hence, although man does not cause variability and cannot even prevent it, he can select, preserve, and accumulate the variations given to him by the hand of Nature in any way which he chooses; and thus he can certainly produce a great result. It can also be clearly shown that man, without any intention or thought of improving the breed, by preserving in each successive generation the individuals which he prizes most, and by destroying the worthless individuals, slowly, though surely, induces great changes. We can further understand how it is that domesticated races of animals and cultivated races of plants often exhibit an abnormal character, as compared with natural species; for they have been modified not for their own benefit, but for that of man." For which they were created.

Those of us who are not naturalists, but who have had long experience of animals and plants in their natural state in the bush, could very easily follow Darwin had he adhered to the laws of variation throughout. For instance, in his chapter on cattle and their variations, he says:—"On the Ladrone Islands, in the Pacific Ocean, immense herds of cattle, which were wild in the year 1741, are described as 'milk white, except their ears, which are generally black.' The Falkland Islands, situated far south, with all the conditions of life as different as it is possible to conceive from those of the Ladrone, offer a most interesting case. Cattle have run wild there during eighty or ninety years; and in the southern districts the animals are mostly white, with their feet, or whole heads, or only their ears, black. So that in these two archipelagoes we see that the cattle tend to become white with colored ears. In other parts of the Falkland Islands other colors prevail. Near Port Pleasant brown is the common tint; round Mount Osborne, about half the animals in some of the herds were lead or mouse colored, which elsewhere is an unusual tint. These latter cattle, though generally inhabiting high land, breed about a month earlier than other cattle; and this circumstance would aid in keeping them distinct and in perpetuating this peculiar color."

It is worth recalling to mind that blue or lead-colored marks have occasionally appeared on the wild white cattle of Chillingham Park (England). So plainly different were the colors of the wild herds in different parts of the Falkland Islands that in hunting them Admiral Sullivan states: "Dark spots in one district, and white spots in another district were always looked out for on the distant hills. In the intermediate districts intermediate colors prevailed." Whatever the cause may be, says Darwin, "this tendency in the wild cattle of the Falkland Islands, which are all descended from a few brought from La Plata, to break up into herds of three different colors is an interesting fact." This appears to be caused by the laws of variation and natural selection, but probably there are other causes.

CHAPTER XI.

PRACTICAL HINTS FOR DAIRYMEN FROM MODERN WRITERS.

The most essential point to obtain in dairying is to have a good breed of cows that are well adapted for the land and climate, and for the purpose for which they are mainly intended—i.e., whether for the production of milk or butter or cheese.

Gentle treatment, combined with good and regular feeding, and sufficient shelter, are important factors in dairying.

Cows are sometimes milked oftener than twice a day with advantage; but, as a rule, this is unnecessary, the udder of the cow being of sufficient capacity to hold the milk.

The time of milking will have to depend upon circumstances. Where a trade is done in selling milk it will be necessary to fix a time, morning and evening, which will suit the railway trains that carry it off. But whatever the times of milking may be, the operation should always be performed at regular hours.

A dozen cows are generally considered enough for one person to milk and otherwise attend to. Some men will milk as many as fifteen or twenty, but this is too great a number for one person to undertake. Some cows will give their milk in five minutes, whereas other cows might take ten minutes. If the milking is not carefully and properly done, both the quantity as well as the quality will be seriously diminished; and it sometimes happens that serious permanent injury is done to the cow's udder by careless milking.

It has long been considered as a fact that if the "afterings" or "strippings" are left in the udder they become absorbed into the system, and Nature gradually generates no more than to supply the waste of what has been taken away. It will thus be readily seen that the greatest possible care should be used in milking the cows.

The temper of cows are often spoilt by bad management and rough usage at milking time, and therefore considerate persons should always be chosen to perform every office connected with the milking, tending, feeding, and general management of the herd.

It may be generally accepted that upon the methods adopted in feeding the cows will mainly depend both their productiveness and profit, and the quantity and quality of the milk will be found proportionate to the nourishment of the food that is given them, provided the cows are suitable for their purpose. Linseed, pea, and oat meal may produce richness; and in Holland, where a great deal of attention is paid to milk cows, when fed in the house it is usual for them to have their water mixed with oilcake, rye, or oatmeal. Brewers' grains will occasion a profuse yield of milk, but it will be of the poorest kind. Amongst those who have turned their attention to feeding with chaffed straw, every kind of straw is sometimes given; though those of barley and wheat are decidedly inferior.

The stomach and digestive organs of the cow, being evidently formed with a view to her subsisting upon bulky but moderately nutritious food, such as grass or hay, it is necessary that her capacious stomach be constantly full if the animal is to enjoy that placid contentment which, in the case of the cow, is favourable for the production of milk.

Now, if fed upon too great a bulk of rich food—and cows can eat nearly as much of one as the other—the powers of assimilation are not correspondingly expansive, and very often stomachic derange-

REFRIGERATORS.

“The Hercules.”

Are Installed in 188 Butter Factories throughout the
Commonwealth.

Their Operation Means—

Top Prices for Butter,

Low Cost of Production,

Increased Bonuses.

Suction Gas Engines and Generating Plants.

Made by FIELDING & PLATT, Gloucester, England

who captured the Gold Medal at Plymouth Exhibition,

November, 1906.

Cream Attemperators and Blenders.

THE “HERCULES” PATENT

Cream Coolers.

THE ARCTIC PATENT

Dairy Requisites.

C. A. MACDONALD, 63 Pitt Street, Sydney.

PRACTICAL HINTS FOR DAIRYMEN.

ments ensue. Not only is there a considerable waste of food, but the constitution of the animal becomes seriously injured.

When roots and straw chaff are mixed together for the purpose of being given to the cows, they should be mingled for a few hours before being required for use, as a slight fermentation will then have taken place, which is much relished by the animals.

Good sound hay, it must be admitted, is good for cows, but it is an expensive method of feeding, and not so great a supply of milk is to be obtained as where more generous food is given, the cost of which, by various economical contrivances, can be very much reduced and better returns obtained.

Regularity in the time of feeding is of the utmost consequence, and the cows should be disturbed as little as possible when fed upon the soiling, or house-feeding system; uninterrupted high feeding while they are in full milk is the surest way to profit. Cows resemble human beings in liking a change of food, and where they appear to surfeit upon any particular one it is very easy to make a change for them.

By giving concentrated food to the cows the yield of milk is increased and its quality is also greatly improved, which is a very important point in butter making.

It is common for many farmers to turn their cows out into a poor run when dry; but this is a very bad plan, for although it is not necessary to keep them in full flesh, yet if allowed to fall off until they become lean, not only will their milk become poor when the time of calving has arrived, but will be deficient in quantity, and the loss in dairy produce will be much greater than any saving effected in fodder.

It should ever be remembered that it does not pay to feed dairy cows insufficiently; with a view of obtaining full profit every owner should give them a sufficiency of appropriate food.

Milk may be described as the secretion of the mammary glands of the female mammal. It is a fluid which is secreted for a longer or shorter period after giving birth.

The exact method in which milk is formed in the udder is, as yet, far from having been clearly demonstrated. Two important theories have been advanced—(a) Milk is formed directly from the blood, and is, in fact, a sort of filtrated blood; (b) milk is the product of the decomposition of the epithelial cells.

The composition of the milk of different animals is practically the same, although a considerable variation occurs in the proportions in which its different constituents are present. The amount of milk yielded by a cow depends on the activity of the milk glands in the udder; and this, in its turn, is influenced by a number of conditions.

The number of changes which are constantly going on in milk are borne witness to by the rapidity with which that valuable food sours, coagulates, changes, and color, &c., when kept for any time. These changes are, many of them, of a very complicated nature, and as yet little understood by scientists.

Milk, as it comes from the udder, may be described as of practically uniform composition. If, however, we let it stand at rest for some time, we find that the uniformity of its composition is disturbed by an accumulation which takes place more or less quickly on its surface, of its minute fatty globules. Concurrently with this separation of the fat, a change takes place in the color of the main body of the milk.

On its arrival at the dairy, milk is always more or less infected with bacteria, it being impossible to protect it entirely from infection in practical dairying. Bacteria are the tiniest forms of organic life

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

known ; they are single cells belonging to the lowest type of plant life.

The milker must be aware of the fact that he may spoil the milk by untidiness and carelessness. He must be himself cleanly, and should wear neat clothes and a clean apron. In what contrast to this, as it would seem, simple rule is the manner in which many of our milkers usually appear in the cow stalls.

The milker must be particularly careful to clean his hands previously to milking. They invariably come in contact with the milk during the milking, and by this means may cause a direct infection. After having milked a cow he ought to carefully rinse his hands in clean water.

Many good dairymen assert that milking ought in no case to be done with wet hands. The milking with wet hands, however, is so common that we just as often hear it asserted that it is impossible to milk cows properly with dry hands.

The manner of milking varies with different milkers. Some milk holding the teat between the forefinger and thumb ; others prefer to use the whole hand in the operation. The milk, they say, is not formed in the teats, and the elaboration of the milk is not therefore forwarded by stretching them.

The milkers should closely observe the appearance of the milk during milking, to see whether it is normal when drawn. If it has an unusual appearance it should by no means be mixed with the rest of the milk.

As soon as the milk is brought into the milk room it ought to be strained through a fine strainer. By straining the milk in a current of fresh, pure air, the milk is freed from many forms of bacteria, as also from its cowy odours.

What every dairy farmer and creamery man most always keeps in mind during the continued treatment of milk is that if the milk is to be subjected to a process of manufacture it must be kept at the temperature most suited for the different manipulations ; but when left to itself the milk should always be kept as cool as the condition of the milk room will permit.

A milk cooler of an approved make should always be kept in practical use, either for cooling milk for town or city distribution, or for cooling cream immediately it is separated from the new warm milk as it is being milked from the cows.

A very common and strong infection of the milk—which takes place both in the cow stalls and the dairy—is the one caused by carelessly cleaned milk pails and cans. Even the first vessel which holds the milk when drawn from the udder—the milk pail—often leaves much to be wished for as far as cleanliness is concerned.

In many places it is the custom to use boiling water to which soda has been added, for cleaning milk pails and cans. The indiscriminate use of soda cannot be commended, as it often only neutralises or hides the acid that may be in the vessels for that particular time only. Absolute sterility can, of course, never be reached in a businesslike practical dairying, but it is nevertheless the duty of every dairyman to try to reach a certain degree of sterility in the milk can and pails. The means at hand for checking the development of bacteria are—(1) scrupulous cleanliness throughout the cow stalls, milk room, cooler, and separator ; (2) cooling the milk or cream as quickly as possible ; (3) light, fresh and dry creamery rooms.

A cow that is a good milker is probably one that has been bred for that purpose ; or in other words, there are certain types of animals

known by certain characteristics that are recognised by breeders of milk cows; and very often in order to produce this type of cow breeders use animals closely related so as to get fixity of type and certainty of characteristic. This relationship, occasionally, affects the vitality of the animal, and it is further lowered by the very property—namely, good milking quality, for which it has been bred. It follows, therefore, that good milkers are more likely to contract disease than those giving a less supply of milk. They are probably closely allied as regards their breeding, and the excessive drain on their blood may not be compensated for in their food supply; thus the animals become susceptible to disease germs.

It must be remembered that cows that are large milkers are unnatural cows; they are like cultivated plants—very delicate. A common cow that gives only enough milk for her calf may stand neglect, but a good milker will not.

Cows in calf should have plenty of exercise; but great care should be taken that they do not fight with other cows or meet with any accident. They must not be allowed to jump or run, and they must not be driven fast or jerked.

The feeding of a heifer should be liberal. She should have regular rations of the food prepared and given to the cows, and about half as much of it will be eaten profitably. Liberal feeding of good food develops the digestive functions, and the training of a heifer for the dairy should be such as to encourage the healthful disposal of as much food as possible—consistent with economy.

The calves are the means for the improvement of the dairy. By a gradual course of breeding, rearing, and development the calves become the basis for all the skill of the dairyman's work in improving his stock, and increasing their product.

Breeding one's own cows is the surest method of attaining success in the dairy. When a cow is bought you are not at all sure of her blood; she herself may be a large and rich milker, and may milk for a long time, but you are not sure of her producing the same qualities in her progeny.

Breeding one's own cows is very often cheaper than buying them, provided one has extensive grass lands on which to run his young stock. But it will not pay to raise one's own cows on small areas.

Cattle need protection from the midday sun and heavy rains. If there are no shade trees on the grounds under the shade of which the cattle stand, or breakwinds to protect them from the cold winds, there should be sheds erected for them.

Some people are penny wise and pound foolish, and will buy cows of no defined breed and of very inferior milking qualities, rather than pay a decent price for a good cow. An inferior cow can be bought for a few pounds, but she will give little or no milk, and her food and keep will cost more than her milk is worth; and her calf will be valueless.

It is always more profitable to keep a cow giving a large quantity of milk than one that gives only a small quantity. A good large cow will give from five to six gallons of milk per day; and the cost of her food and keep will not exceed from the fourth to the third of the value of her milk.

In a herd of sixty cows on a dairy farm, on the average one-fourth will have to be replaced every year owing to various causes. A good bull is, therefore, essential, whose stock will year by year take the place of the discarded cows.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

There are both good and bad milkers in every race ; the proportion, however, of each presents a certain constant character, by which some breeds may be recognised as possessing a decided milking superiority. Climate and nature of pasturings have also great influence on the lacteous qualities of the different races, varieties, and sub-varieties of cattle.

A large cow will consume 100lb. of green food per day, which could not be valued at less than 6d. or 8d. if properly raised ; thus her keep would amount on good pasture to from 3s. 6d. to 4s. 6d. per week. When food is scarce, as it sometimes is at the beginning of spring or autumn, she should receive some concentrated food with hay. Where this is the case, an estimate must be fixed as to the price it will pay the farmer to feed hay to his cows, and that estimate can hardly be fixed above £3 per ton.

Suppose a cow to be fed at the rate of 56lb. per day during 120 days ; she will consume exactly 3 tons, which, at 60s. per ton, is £9. No other calculation is necessary to prove that feeding cows with hay is, as a rule, out of the question.

Oil meals are so called because they are the residues left after the extraction of the oil from certain seeds and nuts, among which are cotton seed, flax seed, sunflower seed, cocoanuts, hemp seed, poppy seed, rape seed, sesame seed, palm nuts, peanuts, and walnuts. Of the residues from these sources, those from cotton seed, flax seed, and cocoanuts are in more common use. Those who have carefully studied the economical feeding of dairy cows have long since become convinced that the selection of a ration which shall be the best possible from a business standpoint is not a simple matter. We must always distinguish between the combination that is most efficient physiologically and productively, and the one that is the source of largest profit.

It is often the case—perhaps generally—that a food mixture which induces a high rate of production is the most profitable one to use ; but this occurs only when business conditions make it possible. Many seem to think that if a ration is “balanced” it necessarily meets all the requirements for the maximum profit, but this is by no means correct, and requires careful study.

It is necessary to understand the capacity of a cow, her ability to produce, the effects of the sundry foods upon her health and condition, her appetite and tastes, the quantity and quality of her product, and the profits derived from her use.

No commercial feeding stuffs are regarded with greater favour, or are more widely and largely purchased, than the by-products of the grain millers. Wheat bran and middlings are cattle foods of standard excellence, whether we consider composition, palatableness, or their relation to the quality of products. Nearly all the herbaceous plants that are grown for consumption by farm animals may be fed either in a green or dry state. Oats, maize, sorghum, lucerne, &c. which serve so well for winter and spring feeding, are also dried, and can be successfully stored in the form of hay.

There is a widely prevailing opinion among dairymen that the character of milk is intimately related to the kind and quantity of food from which it is produced; that is, a dairyman who is possessed of sufficient knowledge may, by variations in the ration, cause material changes in the composition of the milk of his herd. This may be possible up to a certain standard, but forcing the production of a herd is governed by the law of limitation, beyond which it is very unwise to attempt to pass.

CHAPTER XII.

FIFTY DAIRY RULES.

The Washington State Bureau of Animal Industry published a few practical dairy rules, which with some few alterations to suit our colonial conditions, should prove a valuable guide to our dairymen. They read as follows :—

To Owners and Helpers.—(1.) Read current literature, and keep posted on new ideas.

(2.) Observe and enforce the utmost cleanliness about the cattle, their attendants, the stalls, the dairy, and utensils.

(3.) A person suffering from any disease, or who has been exposed to a contagious disease, should remain away from the cows and the milk or cream.

The Stalls.

(4.) Keep dairy cattle as much out in the open as possible, but when indoors they should be kept separate in well-ventilated stalls.

(5.) Stalls should be constructed so as to admit of ventilation, light, and good drainage. The floors should be close, but the walls may be slightly open.

(6.) Never permit musty or dirty litter to remain in the stalls.

(7.) Allow no strong-smelling material in the stable for any length of time. Store the manure under cover, outside the cow shed, and remove it to the soil and plough it under as often as convenient.

(8.) Whitewash the stalls once or twice a year. Use land plaster in the manure gutters daily, sprinkled with a little lime.

(9.) Use no dry, dusty feed just previous to milking; if fodder is dusty, sprinkle it with water before it is fed to the cows.

(10.) Clean and thoroughly air the stalls before milking. In hot weather it is well to keep the shed as much open as possible; but avoid the dust.

(11.) Keep the stalls and separator room in good condition, and then insist that the factory or place where the milk or cream goes be kept equally well.

The Cows.

(12.) Every dairyman should be his own inspector. He should not wait to be told that his cows are in good or bad condition. He, if he has any experience, ought to be the best judge.

(13.) Promptly remove from the herd any animal suspected of being in bad health and reject her milk. Never add an animal to the herd until as certain as possible it is free from disease, especially tuberculosis.

(14.) Do not move cows faster than a comfortable work while on the way to place of milking or feeding. It is a waste of energy that costs money.

(15.) Never allow the cows to be excited by hard driving, abuse, loud talking, or unnecessary disturbance; do not expose them to cold storms.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

(16.) Do not change the feed suddenly—do it by slow degrees.

(17.) Feed liberally, and use only fresh, palatable foodstuffs ; in no case should decomposed or mouldy material be used.

(18.) Provide water in abundance, easy of access, and always pure ; fresh, but not too cold, as then only a little satisfies their thirst.

(19.) Salt should always be accessible, as it promotes health.

(20.) Do not allow any strong-flavoured food, like garlic, cabbage, and turnips, to decompose in the stalls. Turnips and cabbages should be fed after milking. Cows should not be allowed to eat onions or garlic.

(21.) When kept in the stalls cows should be cleaned daily. If hair in the region of the udder is not easily kept clean it ought to be clipped.

(22.) Do not use the milk for a few days after calving. This milk is the natural and most proper food for the young calf.

Milking.

(23.) The milker should be clean in all respects ; he should not use tobacco ; he should wash and dry his hands just before milking.

(24.) The milker should wear a clean outer garment, used only when milking, and kept in a clean place at other times.

(25.) Brush the udder and surrounding parts just before milking, and wipe them with a clean damp cloth or sponge.

(26.) Milk quietly, quickly, cleanly, and thoroughly. Cows do not like unnecessary noise or delay. Commence milking at exactly the same hour every morning and evening, and milk the cows in the same order ; each person should milk the same cows.

(27.) Throw away (but not on the floor, better in the gutter) the first few streams from each teat ; this milk is watery and of little value. It may, however, injure the rest of the milk, which is very valuable and important.

(29.) Milk with clean hands, and as dry as possible ; never allow the hands to come in contact with the milk whilst it is being treated on the premises.

(30.) Do not allow dogs, cats, or idle persons to be around at milking time.

(31.) If any accident occurs by which a pail full or partly full of milk becomes dirty, do not try to remedy this by straining, but reject all this milk, and rinse the pail. Do not revenge the loss on the cow.

(32.) Weigh and record the milk given by each, and take samples at least once a week for testing for fat process. A pair of scales and a simple milk tester should be in the possession of every dairyman, for reasons too numerous to mention under these headings.

Care of Milk.

(33.) Remove the milk of every cow at once from the stable to a clean, dry room, where the air is pure and sweet. Do not allow cans to remain in stalls while they are being filled, or in the rain.

(34.) Strain the milk through a metal gauze and fine cheese cloth as soon as it is drawn from the cow.

(35.) Aerate and cool the milk as soon as strained. If an apparatus for airing and cooling at the same time is not at hand, the milk should

FIFTY DAIRY RULES.

be aired first. This must be done in pure air, and it should then be cooled to 45deg. if the milk is for shipment, or to 60deg. if for home use or delivery to a factory.

(36.) Never close a can containing warm milk which has not been aerated.

(37.) If cover is left off the can, a piece of cloth or mosquito netting should be used to keep out the flies and other insects.

(38.) If milk is stored it should be held in tanks, surrounded by fresh cold water—renewed daily—in a clean, dry room. Unless it is desired to remove cream, then it should be separated after being aerated, and the cream cooled and treated as above mentioned. This is most important.

(39.) Keep the night milk separate, and on no account mix it with morning's milk. This practice is to be avoided, as it injures both lots of milk.

(40.) If it is necessary to mix morning and evening's milk for cheese making purposes, allow the cheese maker that privilege.

(41.) Milk should never be frozen, as freezing injures the fat globules.

(42.) Under no circumstances should anything be added to milk to prevent it from souring. Cleanliness and cool, fresh air are the only preventives needed about the dairy—both are obtainable in the country.

(43.) All milk should be in good condition when delivered. This may make it necessary to deliver twice a day during summer, when very hot, sultry days are experienced, with close, muggy nights.

(44.) When cans are hauled far they should be full, and carried carefully.

(45.) In hot weather cover the cans with a clean wet canvas cover.

(46.) Cream should be treated with the same care and attention as milk. It should be delivered at the factory in the best possible condition.

(47.) As it requires good clean milk to make good cream, it also requires good clean cream to make good butter.

The Utensils.

(48.) All milk and cream utensils for the dairy should be of the best makes. Never allow them to get rusty or rough inside.

(49.) Do not haul waste products back to the farm in the same cans used for delivering milk or cream. When this is unavoidable, insist on having them washed and aired immediately they return home.

(50.) Clean all dairy utensils by first rinsing them in warm water; then clean inside and out with a brush and hot water in which a cleansing material is dissolved; then rinse, and lastly sterilise with boiling water. After cleaning, keep utensils inverted in pure air, with plenty of sunlight.

WAUGH AND JOSEPHSON

Boilermakers,
Dairy and Refrigerating
Engineers,

342, 344, 346 Sussex-st., Sydney

Sole Agents for the _____

ALFA-LAVAL Cream Separators.

Nearly **One Million** "ALFA-LAVAL" Cream
Separators in use.

Hand Machines.	Steam Turbine Machines.	Belt Power Machines.
13 and 22 gallons per hour	65 gallons per hour	150 gallons per hour
33 and 44 ditto	110 ditto	300 ditto
65 ditto	150 ditto	440 ditto
88 ditto	300 ditto	
130 ditto	440 ditto	

"ALFA-LAVAL" Cream Separators command the market for the following plain reasons:—

BECAUSE the "ALFA-LAVAL" were the pioneers of mechanical skimming, and have ever shown the way in which the extraction of butter-fat from milk could best be effected.

BECAUSE it is a fixed principle of the manufacturers that the very highest standard of material and workmanship be embodied in "ALFA-LAVAL" machines, and no considerations of cheapness exercise any weight whatsoever.

BECAUSE of the "ALFA-LAVAL'S" wonderful prize-winning record—FIRST at every show and exhibition of importance ever held; and

BECAUSE the immense sales—more than those of all other makes put together—enable the manufacturers to command the best brains in what concerns Cream Separator construction.

Lawrence-Kennedy-Gillies Milking Machines

(1908 MODEL)

UP-TO-DATE DAIRYING.

DRUDGERY IN THE DAIRY A THING OF THE
PAST.

SOLUTION OF THE LABOR PROBLEM.
REPAY THE COST IN A SINGLE SEASON.
FULLY MAINTAINS THE MILK YIELD.

CHAPTER XIII.

A FEW PRACTICAL HINTS TO CREAM RAISERS.

The first condition necessary in the manufacture of high-class dairy produce is that the raw materials, milk, or cream, is of good quality. If the cream or milk, as the case may be, is not good, the best management afterwards must fail to produce a presentable article.

In order to produce good cream it is necessary to produce good milk, and in order to produce good milk one must have healthy cows and feed them well with such food as will not be injurious to the quality of the butter, also cheese or other forms of produce.

If the milk has been drawn from the cow in good condition, it is necessary afterwards to manage it carefully until it has been passed through the separator to the creamery or factory.

To attain this, the atmosphere of the cow-stalls must be as pure and fresh as possible; and the milk must be taken as quickly as possible from the cow-stalls to the separating room.

The milk of newly-calved cows is not fit for dairy purposes before a lapse of from three to five days after calving, and such milk, or milk that is in any way out of condition, ought never be put through the separator. Its proper use is food for young calves.

The separating room ought to have an open, dry, and healthy situation. It must not be built in the vicinity of such buildings as emit impure odours. The floors should be made of some waterproof substance, such as cement, glazed tiles, or paving stones cemented together, with a fall to permit perfect drainage.

Dairy cans and all milk vessels are generally made of good tin, and require to be carefully washed and aired after each milking, and as soon after being used as possible, to prevent the dirt from drying on them. In order to obtain good cream, much depends on the management of the separator. The principal points of merit in a separator are as follows:—(1.) That it is simple and strong in construction, that it is easily managed and safe, and that it requires little space and driving power. (2.) That it has the greatest possible capacity, and is cheap in proportion. (3.) That it skims clean and can be easily regulated by any one acquainted with a separator.

In setting a separator it is necessary to have a good foundation, and every care taken that it is set perfectly level—near enough won't do—it must be level. After being properly set, the separator must be taken to pieces and thoroughly cleaned before using. After being cleaned and each placed back in its proper place, each part should be oiled with best separator oil. Other oils are injurious.

The separator should be turned as near as possible the correct number of revolutions throughout the skimming, even feeding being also an important item in the separation of milk.

The temperature of the milk should not go below 76deg. Fahr; a more perfect separation takes place when the warm milk from the cow is passed through the separator. If milk becomes too cold, the cream will not separate freely from the milk.

In order to get good keeping butter, and to expel the animal odours always clinging to milk that has been separated direct from the cow, the cream should be cooled down immediately after the separation.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

This can only be done on the farms by placing the cream cans in a cold water bath until it is removed to the factory.

When the separation has ceased, the oil cups should be attended to, and all the parts that require washing should be carefully washed in hot water, and placed where they can be thoroughly aired.

The separator frame should be wiped carefully and every particle of oil and milk removed after being used. It should be taken to pieces and overhauled at least once a month. This would be a saving of money in more ways than one.

Take care to keep the separator clean and well oiled. Then watch the following factors for obtaining good results:—Even speed, even feed, and even temperature. By attending to these important items, the separator will wear longer, cost less for keep, and produce better quality cream. It will also enhance the value of the product.

By the process of separation two products are obtained—rich cream and poor skim milk. The cream is for the factory, the skim milk for the pigs and calves. Cream, the material from which butter is made, is even more sensitive than milk. If great care and attention must be paid to the milk, this ought still more to be the case with cream, which is both more valuable and easier of contamination.

The organic constituent parts of the cream, such as milk, sugar, and albumen, are liable to changes injurious to the quality of the butter, improper temperature being one of the chief causes of such changes. It often happens that the cream must stand over longer than is desirable for the production of good butter; in such instances special care must be exercised to keep the cream in good condition.

After the cream can has been placed in a cold water bath, it should be frequently stirred, so as to ensure rapid and even cooling.

In former times it was considered necessary for the cream to become quite sour before converting it into butter. It cannot be denied that such butter, if made under favourable conditions, is exceedingly palatable and highly valued for table use; but as it rapidly begins to deteriorate it is useless for export.

One of the chief conditions in the manufacture of export butter is that the cream must be perfectly sweet, otherwise the butter cannot be classed as such. This is patent to all dairymen.

Cleaning the cream cans is one of the most important duties in the dairy. This must be carefully and scrupulously performed in order to remove all remnants of cream, bacteria, and unsound odours. If any injurious particles are left, the cream will be spoiled, and the faults communicated to the butter in a concentrated form, thereby making the butter of inferior quality and lowering its value.

Another mistake is often made—where the quantity is too small to send to the factory each day, it is set aside and mixed with the next day's cream. This should not be tolerated.

CHAPTER XIV.

CHEESE MAKING.

It is almost unnecessary at the outset to state that the condition of the milk from which cheese is to be made is the all-important point in cheese making, and although much has been written on the chemical composition of milk by endless numbers of agricultural scientists and authorities on dairying, no article on cheese making is complete without a brief reference at least to the chemical composition of milk. Briefly put, the average milk of our dairy farms contains, according to best authorities : Fat, 3.8, casein 3.3, albumen 0.7, sugar 4.5, and ash 0.7 per cent. These figures are subject to changes according to the conditions of the dairy cows. But taking average seasons and average herds they will be found fairly accurate.

The casein and albumen are the materials containing nitrogen, and are of special importance in cheese making. In general the ash, sugar, and albumen are in solution, the casein in partial, and the fat in suspension, being mixed with the milk, but not dissolved in it. standing for a short time becomes slightly viscous through the formation in it of a small amount of fibrin."

For the benefit of those who wish to follow the science of milk into its finer points the writer would recommend the purchase of a microscope and an appliance for analysing milk. These, together with an up-to-date work on the chemical analysis of milk, butter, and cheese should enable any dairyman to master the simple troubles of the dairy farm.

We are told by analytical chemists that "milk fat consists of a mixture of several fats." But as its composition begins to undergo changes almost immediately after the milk is drawn, its exact condition at any moment is very uncertain. It is distributed throughout the milk in the form of minute globules varying in size. It was at one time thought that these minute globules were encased in an albuminous membrane, but the examination of milk after being filtered has caused that idea to be somewhat doubted. The relation, however, of the soluble and insoluble portions of the casein is a matter of much importance to cheese makers, as the condition of the casein has everything to do with the action of the rennet. It is but reasonable to conclude that the fat globules and a part of the casein are held in suspension in the milk as drawn from the cow.

The albumen of milk is in complete solution, and seems to differ only slightly from the serum albumen of the blood." It is, therefore, probable that it is derived from the albumen of the lymph in the blood of the cow.

Milk sugar exists in milk in a state of complete solution. The greater portion of it can be obtained by evaporating the water from the whey.

The ash of milk contains quite a number of mineral constituents. These can be obtained to a great extent by extraction from the milk sugar contents.

Before attempting to treat of the process of cheese making we state at once that although cheese making cannot very well be learned from a book, a practical cheese maker can learn much from a well-written article on cheese making. Some writers who are endeavouring to

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

write something very new state something that is very old ; and on the other hand we get something that is very new from the old writers.

The organisms and substances concerned in the fermentation of milk may be divided for convenience into two distinct classes—namely, organised and unorganised ferments. The former include bacteria, which by their growth cause change or fermentation. The latter, on the other hand, are chemical ferments, which are substances devoid of life, such as rennet and pepsin.

The normal souring of milk was at one time regarded as a characteristic of the milk itself. Pasteur's discoveries have taught us differently. He succeeded in locating the trouble, and afterward cultivated the various forms of bacteria in beef broth, gelatine, &c. Ferments cultivated in this manner are manufactured and sold to cheese-makers throughout the dairy world, and are described as "cultures"

Rennet is a preparation usually made from the stomach of a calf and has the power of coagulating the casein of the milk in a short time.

It has been said that if bacteria are desirable allies of the butter maker, they are absolutely necessary to the cheese maker. Without their agency the butter, though it may taste flat, is still usable, but cheese is worthless without them. New cheese is not palatable ; it tastes like fresh milk curd, and is not at all pleasant. The proper flavour of cheese appears only as a result of a ripening process which is allowed to continue for several weeks or months, the flavour slowly growing stronger all the while. It is evident that the presence of bacteria in cheese is, therefore, inevitable.

Mr. Thomas Binks, of Broughton Village, Illawarra, who is considered one of the few most practical cheese makers in this State, says :—" In cheese making acidity is the greatest enemy, as well as being the greatest friend of the cheese maker. Curd salted too sweet will turn strong and rancid. You must, therefore, wait until sufficient acidity is in the curd before adding the salt. I call this degree of acidity 'Cheddar acidity.' But your milk must be sweet to start with. Sour milk will cause cheese to crumble when placed on the table for consumption. It is, therefore, an all-important item to be in a position to regulate the night's milk. If there cannot be some method adopted for cooling the night's milk in the summer it would be better to give up the idea of cheese making."

" If the night's milk can be cooled down to, say, 70deg. Fahr., I can calculate the quantity of acid development in the vat next morning—provided all the utensils were properly cleaned and in perfect condition. The night's milk receives my best attention, and I consider when it is sweet at 70deg. Fahr. (of course on sultry nights the milk must be still further reduced in temperature). I cannot fail to make good cheese—70deg. Fahr. is my fancy temperature for night's milk in order to make a substantial commencement with my batch of cheese.

" I commence operations as soon as the last cow is milked in the morning. Mixing night and morning's milk together, then heating the whole lot up to 86deg. Fahr., add to the milk the desired amount of Hansen's cheese coloring, and stir gently until distributed throughout the milk ; then add Hansen's rennet to suit the purpose, and stir vigorously, and then slowing down. This operation should occupy altogether about four minutes. Then cover up for from forty to sixty minutes, about which time the curd will be ready for cutting. Cut the curd with the horizontal knife first, then use the vertical knife. Then stir with the hands, heating the curd up slowly till 100deg. Fahr.

CHEESE MAKING.

has been reached. Stop heating to a higher degree and stir for fifteen minutes. Let the curd settle and cover up the vat for a time until the curd shows silky threads on a hot iron of $\frac{1}{2}$ in. in length. When this stage is reached run off the whey, and cut the curd into bars like soap. Then put the bars of curd on a rack and turn every twenty minutes, until the curd gets tough and when torn shows threads. It will thus show a hot iron test of 2 in. It is then ready to be put through the curd mill. After putting the curd through the mill commence salting at the rate of 2½ lb. of salt to 100 gallons of milk, which is equal to about 100 lb. of cheese. Put to press at once, putting on the pressure gently at first, after an hour's time heavier for another hour. Then adjust the binding top and bottom and put to press again till next day, when the cheese will be ready for the curing room."

Mr. Binks adds the foregoing system is adopted with sweet milk only:—"It is simple, and requires no rennet test to ascertain one's position before commencing operations. If milk tastes sour in the morning, don't use it. If an accident should happen and the milk turn sour, heat up to 106 deg. Fahr., and carry the whole operation through as quickly as possible." But he prefers sweet milk, and the whole process to take six hours, as follows:—One hour for the milk to coagulate, one hour cutting and heating, one hour cooking, and three hours cheddaring, milling, and salting. Mr. Binks adds:—"When the whey is drawn off the curd, the curd must not be allowed to cool till ready to salt, then only to between 70 deg. and 80 deg. Fahr., as cold curd will not press close enough."

Mr. John Mahon, principal, Agricultural College, Queensland, who is, like Mr. Binks, a most practical cheese maker in all climates and weathers, says:—"If good cheese is to be made it must be done through the production of good milk. The man is not yet born who can manufacture good cheese from unsound or badly handled milk. After a person has been taught his business his whole success as a cheese maker depends on the quality which he is called upon to treat from day to day.

"The milk should be drawn from the cows in the cleanest possible manner, removed from the yard and run over a milk cooler, which should be placed under a sound roof, in a clean atmosphere. The manager should, nevertheless, taste all the milk before allowing it into the receiving vat.

"In Cheddar cheese making the state of the milk and the weather should receive the strict attention of the cheese maker, and calculations based on the facts made for the day's working. Ten minutes' consideration of existing conditions will save much work and worry during the day's operations.

"After the milk has been received in the vat, heat the whole up to 84 deg. Fahr. and add sufficient annatto to suit the market requirements (about 2 oz. will be found sufficient for 100 gallons of milk). Stir carefully for a few minutes. Before adding the rennet we must have a knowledge of existing influences and the relation of the ripeness, heat, and rennet to each other proper to the case. To make a uniform cheese we must have a standard ripeness to work on, and the whole milk must be always brought to that point before adding the rennet. If the milk should get beyond the proper stage of ripeness it must be counteracted in the quantity of rennet, and the temperature of the milk must be reduced. The quantity of the rennet must in all cases be regulated according to the ripeness of the milk, but in sufficient quantities to coagulate the milk in from twelve to fifteen minutes, and produce firmness for cutting in twice and one half that time. Any departure from this method means a loss in flavour and quality.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

The cutting must be done carefully to avoid any breaking or loss of curd value. Cut first with a horizontal knife lengthwise of the vat, then with the vertical knife crosswise and lengthwise. Now cover over with a piece of calico, and allow to stand for about twenty minutes, after which time the stirring and heating should be commenced. Take from fifty to sixty minutes in rising the temperature to 100deg. Fahr. In the case of very ripe milk heat quickly.

“Now we come to one of the most important points in cheese making, i.e., when to draw the whey from the curd, and to determine this point accurately requires a good deal of skill. No accurate acid test has yet been discovered, and consequently we must to a great extent use our own judgment. A person who understands his business needs no other test than the feel and smell of the curd and taste of the whey. If the whey is drawn too soon there will be too much moisture in the cheese; if too late the cheese will be too dry. When in doubt use the hot iron test.

“After the whey has been drawn off, stir the curd occasionally to allow all unnecessary whey to escape; then keep the curd in one end of the vat, and after sufficient time has been allowed for the curd to become consolidated it is cut into convenient pieces—about the size of a brick—and turned over, and allowed to remain for some time for further development of acidity. As fermentation goes on the curd is still getting drier, and changing from a dry appearance to a softer one; at the same time it becomes flaky and mellow. It is necessary to watch this process of ripening with great attention, and it may happen that the hot iron test will have to be resorted to from time to time. When the desired amount of acidity has been attained the curd is milled and salted. The temperature must not be allowed to go below 70deg. Fahr. during this process. About from 2lb. to 2½lb. of salt to every 100 gallons of milk will be found sufficient. A moist curd will require more salt than a dry one.

“It is of very great importance that the curd should not be put to press at a temperature lower than 70deg. Fahr. This temperature is suggested with a view of conserving the butter fat in the cheese and reducing fermentation.

“Too much importance cannot be attached to the process of curing. No matter how careful or skilful you have been in turning out a good article it will be all wasted unless attention is given in this direction. Cheese properly cured in from two to three months' time according to this process.”

The above systems of cheese making are suitable for dairy farmers in a large or small way who have no refrigerating appliances. But where the milk can be kept under control by means of mechanical appliances the following system

CHAPTER XV.

PIG RAISING.

As a valued writer puts it :—"The hog is an animal whose properties are calculated, in a very remarkable degree, at once to awaken the aversion and command the consideration of mankind. The former sentiment is necessarily excited by the habits and manners displayed by the animal during life ; the latter is the natural result of reflection upon the numerous sources of profit derivable from his carcase after death." From practical experience, however, we at once find the hog a very clean animal in its habits ; which, together with the profits derivable from its carcase after death solely depend on the intelligence of its master. Naturalists are agreed that all the varieties of the domesticated hog are derived from one common progenitor ; and that in their wild state they are more numerous and widely distributed than either cattle or sheep. The fact, however, of their being possessed by many races of men who have neither cattle or sheep, denotes that they have long since been domesticated, and are, in common with all animals originally found in the service of man, of Eastern origin, having been carried by mankind from the East to the West.

The hog is not bred and reared as a domestic pet, nor as an ornament, but for the money that is in him, and he represents either a profit or a loss to his owner, according to the treatment he receives.

The domesticated hog is an animal of very great importance from an economical point of view. Like most animals, domestication has the effect of multiplying varieties considerably. In a wild state the hog forms an interesting study, inasmuch as their pairing or mating is carried out not only on the lines of the survival of the strongest males, but also on the choice of the females ; and one of their natural checks is the male being always anxious to make a meal of the young ones. It therefore should at once become a most important branch of the study of pig raisers, in order to understand the natural tendencies of the hog, viz., the habits and customs of the hog in its wild state. "Instinct prevails where science fails" is a very old adage, and one that can never be overlooked throughout animal life.

The various breeds of hog would require much describing. It is, therefore, not my intention to touch upon breeds other than those in common use among the pig raisers of these States, and slightly, indeed, on those breeds, as justice cannot well be done to the subject of pig raising short of a comprehensive book, which should be written from both a scientific and practical standpoint.

The Berkshire breed stands first in the list. Many years back the Berkshire had obtained great prominence. But its admirers never paused where they began, nor omitted to follow up with judgment and perseverance the success and advantages they had thus obtained until we find the animal much altered in both color and appearance in the course of a century. According to Laurence, the Berkshire of fifty years ago had attained great size, but was almost invariably a reddish-brown color, with black spots or patches. Since then what is termed the true and improved breed of Berkshire has displaced the old type. The origin of the Berkshire is said to be the result of a cross of the Siamese boar upon the old time Berkshires, a breed common in Berks, Hants, and Wilts, in England. On this point Martin says :—"It is not certain that the desirable points for which the improved Berkshires have long been noted, viz., fine-grained, juicy, well-marbled hams and bacon, were first brought out by the

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

use of the Siamese crosses. The probabilities are that these qualities were characteristics of the Berkshires, in some degree at least, prior to the use with them of that ancient breed."

The improved Berkshires are now known as follows:—Color, black, with smooth, pliable, purple, plum-colored skin; hair rather fine, soft, and thick; feet and tip of tail white, also some white on jowl, with dash or white in face, and not infrequently the nose white; forehead and face broad, the latter dished, with eyes rather large and very clear; the snout short; ears of medium size, thin, and very soft, and carried rather upright; neck short and broad on top and deep through chest; back, broad; sides deep and nearly straight (on bottom line); hams large, reaching well forward on back and well down on hock, well rounded and deep through, causing the short legs to stand well apart; these, as well as the forelegs to standing well on toes; tail tapering, rather fine, and well set up. In general form a modern, well-bred Berkshire in good condition is symmetrical throughout, attractive in appearance, and recognised at once as an animal of more than ordinary worth.

The Chester White is another famous breed of hog, and so far as is known is a native of Chester County, Pennsylvania, U.S.A., and is one of the oldest of domesticated breeds. It is of Eastern origin, but during 100 years it has been less crossed with other breeds than, probably, any other breed, yet it was steadily improved during the last fifty years. They grow to a very large size and mature at about 18 months old. It is said that animals of this breed have weighed 750lb. at 18 months old; and speaking of their prolificacy a writer states that sows of this breed have produced eleven good pigs in four consecutive litters. The National Convention of Swine Breeders adopted the following as the characteristics of this breed:—Head short, broad between the eyes, ears thin, projecting forward and lapping at the points; neck short and thick, jowl large; body lengthy, deep, and broad on back; legs short, and set well under for bearing weight; coating or hair thinnish, white, straight, and if a little wavy not objectionable; tail small, and no bristles. A pure-bred Chester White hog is all white. If he has any dark or black marks, it is evidence of a cross of some kind, and the animal should be rejected as a breeder.

There is another American breed of hog worthy of notice, namely, the "Duroc Jersey," or "Jersey Red," as it is frequently called. It has been developed during the last fifty years into a state of perfection in the State of New Jersey, U.S.A. How this breed was originated is not definitely known, but it is surmised that the Berkshire or Essex breeds had been largely used in developing this breed of hog. The Duroc, or Jersey Red Club, adopted the following standard:—A good specimen of this breed should be red in color, with snout of moderate length; large lop ears; small head, in proportion to the size and length of the body, which should stand high and rangy on thin legs; bones coarse; heavy tail and brush; hair coarse, including bristles on the back. This breed of hog is practically one and the same with the English Tamworths. They are valuable on account of their size and strong constitution, and capacity for growth which is characteristic of the "wild jungle" hog of America.

There are many other breeds of swine which might be enumerated and the salient points given of each, for indeed every country has several breeds peculiar to itself. If we take England for an example we will find numerous breeds in almost every county. There are few counties, however, in England where so much improvement has taken place in the breeds of pigs as Yorkshire, where there are many noted breeders of what are generally known as the large,

PIG RAISING.

small, and middle sized Yorkshires, each of which have their admirers. Then we have the Black Essex, and the Black and White Sussex breeds, and last but not least the Poland China breed—a breed which, like the Yorkshire, forms a valuable cross with the Berkshire breed.

There is, however, a great difference between the hog breeder and the man who raises hogs. The former usually has none but thoroughbred stock, and confines it to a particular breed, and his stock supplies farmers who want thoroughbred boars to cross with grade or common stock, and also those breeders who are establishing themselves in new places.

In selecting a boar for any purpose it is important to see that he is a good representative of his breed; but it is still more important that he should have the power of imparting his character to his progeny. The same care should be exercised in selecting a sow for breeding purposes. But if for the purpose of breeding hogs for market purposes only, care must be taken to get a good roomy sow with plenty of teats and a good milk producer, and of a quiet yet lively disposition. It is considered neither wise nor profitable to breed a sow before she is 8 months old. Sixteen weeks being the period of gestation, it is a simple matter to calculate when to expect a certain sow to farrow, and the breeder can accordingly prepare for her comfort and accommodation.

The great value in little pigs depends much on the care they and their mother receive during the first few weeks of their life. Feed them with a view of promoting their steady growth, which should never be interrupted from the time of their birth. This does not mean to overfeed them or force them in any way whatsoever. Pigs from six weeks to three months old need more muscle-forming and bone-forming than fattening foods. Hence clover and lucerne paddocks as pasture for pigs are most desirable. Under this treatment alone pigs have been fattened off at six months old, the topping off being done with milk, maize, and peas in a few weeks. At two months old such boars as are not needed for breeding should be castrated, some pig raisers preferring a still younger age for that operation. Plenty of pure water should always be at the service of the hog, together with a certain amount of salt, sulphur, lime, potash, and other minerals contained in the ashes of coal, wood, and corn cobs. The two former minerals can be given in food.

The life of a hog may be divided into three periods: Weaning, growing, and fattening. The skin of a hog—like most domestic animals—is an envelope by which we can tell the contents by holding it up to the light. Only, in the case of the skin of an animal you use largely the light of reason and experience for drawing your deductions, with regard to the contents of the outer covering, of what is within. Those who raise swine are well aware of their liability to disease, and will all agree that proper, rational treatment will prevent it. Many of the diseases of swine are contagious, and when a pig is found to be sick it should be removed to a pen by itself. Owing to the stringent laws, which unfortunately are not always of the wisest nature, it would be unwise in an article of this nature either to enumerate the diseases of swine or to suggest remedies for same.

Diseases in swine are much more rapidly prevented than cured, and no reasonable pains should be spared to keep the herd in a clean, thrifty, and healthy condition. The best preventives are those practised by the intelligent farmer, who takes pains to keep his herd peaceful, clean, thrifty, and healthy.

In building pens, sheds, or houses, build them in a substantial manner. The elaborate piggery, which is being constantly figured

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

in all books on swine husbandry, is often the most disappointing of luxuries to the pig raiser. A piggery should be well ventilated without being exposed to cold winds. Every part should be arranged so that it can be cleaned and dried quickly.

It is patent, however, that after providing for the constant cleanliness and bodily comforts of hogs, it is most important that those who are about to embark in this industry should have a thorough knowledge of pig foods and their feeding values. As a practical writer puts it:—

The practical lesson of all this plainly is that young pigs, and inferentially young stock of every kind, should be fed on a mixed diet, made up largely of foods rich in nitrogen. What those foods are will be easily seen by a glance at the table given further on. For young pigs, no single food equals milk, and nothing is better than milk for making superior pork from mature animals. The milk will, in nearly all cases, be fed to best advantage by mixing it with pollard when for young pigs, and with maize meal when fed to mature hogs. Maize, barley meal, and like starchy and sugary foods ought to be reserved for the process of finishing off mature animals, unless mixed largely with foods richer in nitrogen.

The table following is given with the view to aiding in forming judgment as to the feeding value of familiar agricultural products. While the column headed "Flesh-formers" gives the actual amount of nitrogenous materials—albumen and protein—contained in each article, its value for this purpose depends not upon the actual amount of nitrogenous or plastic material contained in the food, but in the amount relative to the other materials:—

	Water.	Flesh-formers.	Heat and Fat Givers.	Mineral Matter.
Barley	15.1	8.0	76.0	0.9
Beans	12.0	26.0	59.0	3.0
Bran	12.28	15.07	66.75	5.70
Cotton-seed meal .. .	8.52	42.39	42.03	7.26
Cow-pea vines (green)	84.07	3.12	10.98	1.83
Lucerne	69.95	3.83	14.44	3.64
Maize	12.0	12.0	75.5	1.5
Milk (new)	37.2	4.0	8.1	0.7
Milk (skimmed) .. .	88.6	4.0	6.6	0.77
Oats	12.2	18.0	59.0	2.54
Peas	15.0	22.6	60.5	2.5
Pollard	12.0	15.17	69.57	3.26
Potatoes	75.0	1.4	22.6	1.0
Pumpkins	92.27	1.11	5.99	0.63

Aside from their chemical composition, foods differ greatly in their effect upon the character of meat both fat and lean. Maize gives a much firmer, whiter pork, and one that boils away in the pot much less than that made from pollard. Peas, too, make a very firm, sweet pork, while oil-cake and oily foods in general produce a pork that is soft, flabby, and ill-flavoured.

The following hints from Mr. Watson, a prominent colonial bacon curer, may be of interest to non-professional curers in this State:—

"Pigs before being killed should be perfectly cool—that is to say, if they have been driven any distance, or even carted to the place of killing, they should be allowed at least a couple of days' rest before being killed. It has been my experience that pigs well fed, and so treated, together with being well slaughtered, are already half cured.

"Some people run away with the idea that the only way to cure

PIG RAISING.

pork is by a system of hard rubbing, and using little salt. Some men even go so far as to use leather gloves with iron spikes for the purpose of rubbing the salt into the pork. This is a great mistake, as the rubbing springs the pork and admits the air, which means taint. It has been argued that dry salting is preferable to curing in brine. But in a hot climate such as we have here the use of pickle cannot be dispensed with. We must first of all place the pork in pickle. A pig weighing, say, 1cwt. will require from five to six days in pickle, about four days in dry salt, and so on according to the size of the pig, and also the weather to be contended with. In hot, close weather it will be necessary to leave the pork in brine for two or three days longer in order to effect a cure.

“The process of preparing the pickle is quite simple. You take so much cold water and add salt until the pickle will float an egg or potato. To every cwt. of pork add 1½oz. of saltpetre, then the pickle is ready for use. In ordinary weather it is only necessary to turn the pork once in every two days, but if hot and close it must be turned every day. The hams should be left in pickle from six to ten days according to the size of the pig and state of the weather. The hams should not be taken out until they are perfectly cured. Very large hams will require about a month in salt before being properly cured.

“After removing the pork out of the salt it should be placed rind upwards in cold fresh water from six to eight hours, in order to abstract the salt, carefully observing that none of the salt is left in the pockets. After this is done, hang it up in some airy place. In good weather it should dry in one day. The pork should be thoroughly dry before being put in the smoke house, otherwise the smoking will not be satisfactory.

“In smoking bacon or hams never allow either to hang closer than from 8ft. to 10ft. above the fire, and in order to obtain a good smoke it is necessary to allow a current of air through the smoke house. This can be secured by having an opening both at the bottom and top of the house, which can be regulated according to the weather.

“The best material to use for smoking is oak sawdust, which is very difficult to procure in this State. But the next best is pine sawdust with a mixture of wheaten straw. About a bag of this mixture will be sufficient for one smoking. On no account use firewood, as it gives a black dirty smoke.

“After being taken from the smoke house the bacon should be wrapped up in strong calico or other material. The wrapper should be a little larger than the bacon, so as to admit a quantity of oaten or wheaten husks. If either of these cannot be procured, dry chaff will do, though not so well. In the case of the latter being used it is imperative that the chaff be thoroughly dry.

“Bacon and hams, like all other products, require to be well ripened before they are fit for use. Bacon requires at least one month, while hams will take three, after which the colonial article will possess the taste and flavour of the best Irish or English hams.”

It would appear that the pig industry of this State, notwithstanding all that has been written on the subject, has been gradually decreasing in importance. Why this should be the case is very difficult to get at. Farmers as a rule follow up any paying industry to the last penny of profit is exhausted. But we have the testimony of Mr. Charles Barnes, who says :—

“It is regrettable that the pig-raising industry, which should be a valuable adjunct of the dairy farm, has not received that care and attention to develop it which it deserves. In the sixties and seven-

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

ties this State was supplying Melbourne and Adelaide with hams, bacon, &c. Late as the early eighties the State was supplying Queensland, and though prices have advanced fully 30 per cent., today we cannot nearly meet our own requirements. This is a highly unsatisfactory condition of affairs in a State with all our facilities for pig-raising, and is a very serious matter for the country, and one that should receive careful enquiry at the hands of our Agricultural Department to ascertain the reason why. With the spread of the dairying industry throughout the State it was anticipated that there would be a large surplus of pork, and some of us went to a good deal of trouble and expense to exploit other markets in order that any surplus might be profitably shipped at from 3½d. to 4d., which must be regarded as profitable prices.

“Following are the weights of pigs bred and fed at the Hawkesbury College some years ago, when Mr. Valder was in charge, the pigs being under eight months old :—

2	Berkshires,	224lb.
1	cross Yorkshire,	112lb.
2	Tamworths,	290lb.
2	Yorkshires,	244lb.
1	medium Yorkshire,	104lb.

“I may say I have had much better results than are shown in the above figures with the Berkshire and Tamworth cross. I have had them weighing 116lb. at 16 weeks old.

“In breeding pigs successfully, great care must be exercised in the selection of your stud. The boar should have especial attention, as he is the mainstay. My experience is that, with the right boar (be careful that he is a prolific stock-getter), select good roomy sows with plenty of length and with well sprung ribs, so that there is plenty of space for the action of heart and lungs. Avoid the pig which contracts behind the shoulders, and carefully select from a strain of good sucklers. This point is often missed; but if you are going to be successful and get your pigs quickly on the market, you cannot afford to ignore it. Another feature of successful pig raising that is too frequently lost sight of by the growers is that breeding sows and young stock require a good deal of green stuff, lucerne for preference, or green barley or broadcast corn if lucerne is not available. I am fully convinced that one of the reasons why pigs are more affected with tuberculosis and throw smaller litters is owing to this want of green feed when young. In former years, before settlement was as close as at present, the practice was to let the sow and young pigs have the run of the paddocks, where they could obtain the succulent clover, whereas now they are more confined. The following figures show the decrease in our herds of pigs that is taking place in the State, while the increased quantity of bacon needed by our greater population is also shown :—

Production.

1905-06	.. .. .	330,555lb.
1906-07	.. .. .	310,702lb.
		19,953lb. Decrease.

Hams and Bacon Sold in State:

1905-06	.. .. .	10,080,532lb.
1906-07	.. .. .	11,052,440lb.
		971,908lb. Increase.

“The figures for 1906-7 are not to hand at the time of writing, but I am convinced that they show a further marked decrease in our

PIG RAISING.

production of pigs, while the demand is ever an increasing one. It is true that the drought through the State is in some measure responsible for the decrease, yet the position must be regarded as serious. I venture to say that the price of pigs in our State for months past has been higher than the London market. Surely in what we regard as one of the great food producing countries of the world this is an unhealthy sign, and the sooner some enquiry is made as to the why and wherefore the better. We are now a federated Commonwealth, and there is a considerable interchange of bacon between nearly the whole of the States, yet each State has its own local Acts of Parliament governing the inspection and condemnation of diseased meat. Surely this is a matter for the Federal Government, and the law governing it should be uniform in the whole of the States, otherwise, though one State may make stringent laws to protect the health of its people by preventing any animal that is diseased coming into consumption, another State may have little or no inspection, but still its bacon and pork comes into consumption. Here in New South Wales we are only safeguarded so far as our own production is concerned. I trust ere long this matter will receive the attention of our legislators. With our State put on an equality with the other States, and given fair field and no favour, I am convinced that pig raising is going to be a profitable industry for many years to come. With pork at 4d. per lb., I feel sure that with an ordinary amount of intelligence in the breeding and feeding of pigs, any dairy farmer, by growing some feed and using his skimmed milk, can on a rented farm make his rent at least, and if properly managed can cover cost of labor as well. Without the aid of milk I have been able to pay from 4s. to 5s. per bushel for grain and make a profit. With the great advantage the farmer has by raising lucerne and other feeds, surely he should be in a much better position."

"As regards the most profitable pigs to breed, I have no hesitation in saying, from my experience, the Berkshire stands pre-eminently first among the several breeds of pigs in use among the settlers of this State, for the reason that of all the breeds it can be crossed with every other breed with a certainty of successfully augmenting the most valuable parts of the carcase and decreasing the less valuable parts. There is no breed that gives the finely mixed meat and full plump hams, which makes the carcase more valuable, than the Berkshire.

"It is these characteristics which makes the Berkshire so valuable for crossing with other breeds, having, as it were, special power of transmitting these essential qualities to a very large degree to almost any other breed.

The best cross I have tried has been with the Berkshire and Tamworth breeds. As before mentioned, I have pigs raised by this cross weighing 116lb.—dressed weight—at 16 weeks old. In addition, I have found all the good qualities of the Berkshire retained, besides being finer in the skin than the Berkshire, which is a decided advantage in pigs for bacon curing purposes.

"There is, undoubtedly, awaiting us a large export market to South America and the East, to say nothing of the London market, whenever we have made up our minds to the fact that it will pay to treat the pig as a commercial proposition, and not merely to use him as a scavenger to consume our waste products."

In conclusion, let me say that many small ailments to which the pig is heir to may be cured or prevented, if from one to one and a-half tablespoonful of betony—or madder—according to size of pig were given occasionally, as it corrects the irregularities of the digestive organs. It is also advisable to supply the pigs with a few pieces of coal or cinder, as this greatly assists digestion.

CHAPTER XVI.

THE HORSE.

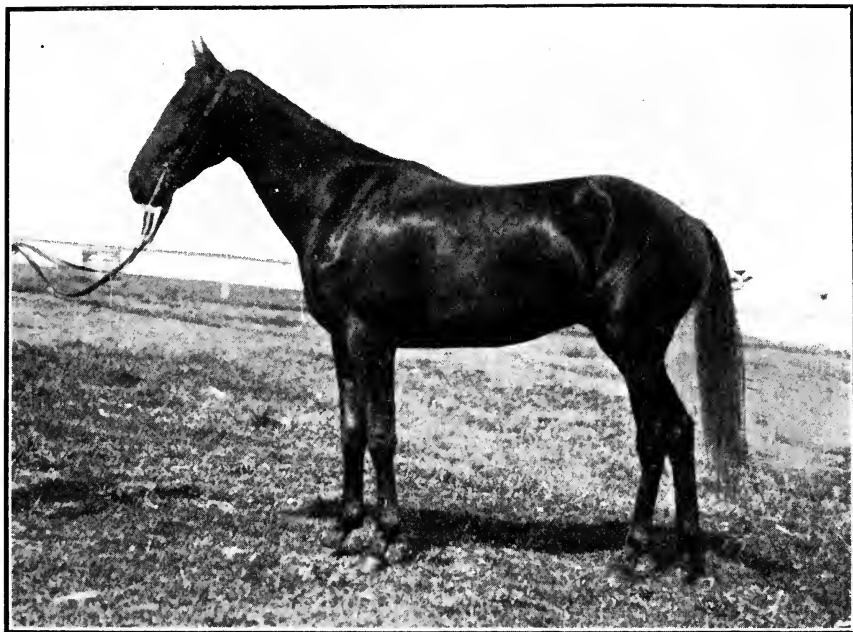
A few words may not be out of place here with regard to the horse of the farm, as every dairyman, large or small, must keep horses, more or less in number, to enable him to carry on the work of the farm successfully. The breeds of horses most suited to a dairy farm are largely a matter of taste or convenience of those who use them, and the purpose for which they are used. As a rule, however, it is generally conceded that the horse that a man can ride, drive in his buggy, and that will draw, say, half a ton with ease in a spring-van, is the most suitable horse for the dairy farmer to keep on his farm. Such an animal is certainly the most profitable. How to breed a horse of this description may not be easily defined, as there are a number of ways of explaining an accident—and a good hackney is very much an accident of birth, hence they are very rare indeed. But to return to the useful farm horse. This animal is sometimes produced by mating an active draught mare with a thoroughbred racing stallion. Low-set, nuggety mares of the Shetland Island type have often, when mated with blood stallions, thrown very useful farm horses.

The feeding of horses—whether plough horses, spring-van, or hackney—is conducted on quite different principles from that of dairy cattle. There are several reasons for this, as first the different construction of the stomach of the animals, and the very different purposes which horses and cattle have to subserv. In order to feed and treat horses properly so as to get the greatest use of them, and still to keep them in good health and condition, some knowledge of the structure of this fine animal is necessary in the interests of the animal and its owner.

As has been stated elsewhere, cattle are so constructed that they can take in rapidly a large quantity of food, and then retire and bring up this food in small balls to be re-chewed before finally taking it down again to be digested. For this purpose they are furnished with four stomachs. The first and largest, called the paunch, is used for storing up the crude food till it can be brought up again; this is termed chewing the cud. Then the food passes successively through the three other stomachs, the fourth being the true stomach, corresponding with that of the horse and the pig. Cattle, therefore, require a large space for their digestive organs, and bulky food to fill them. Hence they are comparatively large, unwieldy animals not adapted for rapid or long-continued exertion, but admirably fitted for forming flesh and fat, and for giving milk. Their food requires then to be bulky, and should contain a sufficiency of water and fat-forming materials.

Horses, on the other hand, have, for their size, a very small single stomach, and are fitted for muscular exertion, whether for rapid motion or for pulling heavy weights. The term, therefore, "good condition," has not the same meaning when applied to a horse, a dairy cow, or a pig. For horses it means lungs well developed, limbs sound, and the muscles all large, and in their outlines no visible superfluous fat, and a general fitness for exertion. For dairy cattle it means the bones well covered with flesh without too much fat, the outline angular, and the bones fine and flat, showing little muscle. The pig, like the cow, can be better judged by its hindquarters and head, which should be well developed, the shoulders being only just large enough to give constitutional vigor. The belly should be neither

THE HORSE.



A Lady and Gentleman's Hackney. Winner of Many Prizes.
Bred by and the Property of Mr. Arthur Grey, The Pines, Kiama.



An All-round Horse. Winner of Many Prizes.
Bred by and the Property of Mr. Arthur Grey, The Pines, Kiama.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

tucked up or pendulous, but should be nearly straight. Cattle and pigs require little or no exercise; horses, on the contrary, cannot remain healthy without exercise. Animals like the horse, therefore, in order to take as much exercise as is necessary, must not have the stomach loaded with bulky food. His food should be regulated according to his requirements.

Nothing is worse for a horse than to work him hard for a time and then to leave him idle for several days in the stable, at the same time making no difference in feeding. This is generally the cause of those ailments which make their appearance in the legs and feet. These general principles should be kept in mind, and what is more, acted upon. All that one can say is that horseowners, even for the common motive of their own interests, should act very differently to this much sinned against animal from what so many of them do in this country. The horse at any time should not be subjected to long fasts. But when he is idle the food supplied should be less nutritious in nature than while working, and less in quantity.

The South Coast and tableland districts of New South Wales have always been noted for the excellence of the horses raised therein, more so in the past than at present. Seventy years ago blackfellows rode far better horses in the bush after cattle than could be seen on most of our racecourses and show-rings to-day. Nevertheless, we have some good specimens now in these districts. Mr. William Rixon, in 1883, drove his pair of horses, Jack and Donovan, for a wager of £50, fifty-two miles, from Bega to Bombala, in 4½ hours. This journey included a climb of ten miles and an elevation of buggy and driver of nearly 3000ft. The wager was that it could be accomplished in five hours. The feat was accomplished with ease.

A REVIVAL IN HORSE BREEDING.

Mr. H. D. Morton, of Coolangatta, says:—

In attempting to say something in print on the subject of horses and horse breeding one is impressed with the hopelessness of setting down anything which has not been said a hundred times. One also feels that, however much may be written, there must still remain a wide gap between what can be actually set forth on this subject and the actual teachings of experience. Perhaps because the horse has been evolved from more than one type, strangely unlike the beautiful equine of to-day, its best characteristics do not become satisfactorily fixed. The breeder of cattle, sheep, or pigs may depend upon it that the exercise of intelligent selection will result in like begetting like, subject, of course, to occasional variations and reversions in type.

The horse, on the other hand, has a sportive fashion of showing off in its progeny the characteristics of every line from which it has been derived. It is, of course, certain that a thoroughbred, mated with a thoroughbred, will produce its own kind, and two draught horses will produce another draught horse. The trouble is that the progeny may happen to be very like its sire or dam, but it is just as likely to be unlike both and to combine the worst characteristics of each. It may be 16 hands high and well let down like its mother, or it may be the same height and leggy and weedy like a remote ancestor. The next succeeding one of the same family may be only 15 hands and a weed, or a stout, well-coupled gentleman with a good set of legs. The fortune of the horse breeder plays him these strange tricks and hundreds of others when he is breeding from established breeds with long pedigrees to back them up. These are bad enough, but when he undertakes cross-breeding he finds that his experiences in the production of pure stock are completely out-distanced by the astounding revelations which ensue as his foals grow into colts and fillies.

THE HORSE.

It is these vagaries peculiar to the animal which render horse breeding a hazardous and discouraging enterprise. Buyers and users of horses continually complain that the breeders do not produce sufficient animals, but it is certain that were it not for the remarkable fascination which the horse possesses for a very large proportion of the human race, horses would very soon cease to exist. Shrewd, long-headed men who would not follow up an unprofitable undertaking one year after it had proved its worthlessness, have continued breeding horses at a loss for twenty and thirty years at a stretch. The fact is that these enthusiasts have all aimed at the ideal which is to produce each year a number of horses of a high character nearly equal in value. Despite the circumstance that each year results prove that however even the dams may be, there will be a tremendous disparity between the best horse and the worst, they still go on following that up till recent years, at all events, could only be regarded as an expensive hobby.

Undoubtedly the disappointments and losses involved in the attractive business was beginning to tell its tale prior to the end of last century, and an appreciable proportion of the landed people were beginning to fight shy of horse breeding. This naturally had an effect upon the supply, and presently the demand, enlarged by the creation of new cities and the extension of old ones, together with the increasing requirements of the Powers who must maintain standing armies, brought about a striking increase in prices. The causes which led to horse values making a special bound upwards in Australia are well known. What is of importance is that prices are now generally acknowledged to be sound enough to justify every man settled on a good bit of country in making horse breeding a side line to his other operations, and, moreover, there is every prospect that these good prices will stand practically for ever.

The material difference which this makes to the producer of horses is not so marked in respect to the very best of his stock as it is in regard to the middle class and inferior sorts. When horses were at their lowest, the odd superior animal still realised a satisfactory value. What caused the losses of the horse breeder in those days was the low figure for good useful sorts, and the impossibility of disposing of the lower grades at the price of the grass upon which they were raised. It was in those days that the ideal of the horse breeder was absolutely necessary of accomplishment from a commercial point of view. Unless he could produce a large proportion of top-notchers, on which he made profits, his losses on the others rendered his undertaking most disastrous.

Now the horse breeder can rely upon profit of some kind from every animal which comes of reasonably good stock, while he has an excellent chance of picking up some good plums with his very best. There can be no doubt that if the production of utility horses, draughts, and ponies is to be raised to its highest standard of profit, our breeders will need to exercise great judgment, not only in the selection of mares and sires, but also in following sound lines and adhering to one policy for a number of years instead of chopping and changing about. Practically speaking, breeders have the choice of three lines of policy. There is a strong demand for light harness horses, with some speed and action, and the coming of the American trotter has provided us with a means of introducing into our stock the requisite characteristics for a useful light harness horse. Crossed with the thoroughbred, the trotter is very useful, and there can be no doubt that our driven horses have been vastly improved in recent years. Perhaps the most difficult demand of all to meet is that for army remounts. Here some quality is required, but the most essential points are strength and activity combined with a thick-set body carried on comparatively short legs. The thoroughbred gives

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

the quality easily, but for this particular purpose the blood horse is apt to get his progeny too high on the leg and too light. On the other hand, if the thoroughbred be altogether departed from, thick straight shoulders are apt to come in, and the best lines of a saddle horse are wont to disappear. It remains to be proved which of the several combinations used to produce the remount are likely to be most generally successful. Stout Welsh pony stallions and thoroughbred mares strong and short on the leg are regarded by some as the best of combinations, while others like the cob class mated with light mares. Probably there will never be any general rule, and it seems likely that in this, as in some other branches of horse breeding, certain sires will prove by the character of their descendants that they are specially adapted for producing remounts from any good sturdy class of mares. We might expect to see a great deal more attention paid to producing high-class ponies. New South Wales is probably stronger than any of the other States in useful light horses, but she is decidedly weak in ponies. The demand for India and other places is very solid, as is also that for Australian cities. Ponies are inexpensive to keep. They are good doers, and one can almost always make sure of getting a good pony from good stock. Welsh pony stallions are becoming popular, but it is very likely that the highest priced ponies will always be those in which a dash of blood lends elegance of appearance and fire in movement. There are numbers of good pony mares in this State, and with a little care in mating it would be an easy thing to bring about an all-round improvement in the stock.

CHAPTER XVII.

ON SOILS.

We have had ample evidence of what Illawarra and the Shoalhaven Valleys could produce in the form of grasses and fodder plants in the past. We have proof enough that owing to careless relations between landlords and tenants bad examples in farming have been set and even followed by those who farmed their own lands. Every practical dairyman should know that manure is the mother of all crops, so therefore it ought to be resorted to as the first step to farm with success. The more manure we make the more crops we can raise, and the heavier our crops the larger our manure heap. Our maxim should be to plough deep and bury the manure firmly in the soil, as our system of farming must be different to other countries owing to the dry weather and heavy falls of rain occurring alternately. Cultivate if possible when the weather is dry—never wait for a set day. Much better to plough a little at a time and do it well, than hurry over it and leave it half finished.

Soils vary very much in their composition. Even in the South Coast districts we have a great variety of soils, and what is more important still to know is that the composition of any particular soil is so difficult to ascertain accurately. In fact, the composition of a soil and the mineral salts contained in the grass and fodder plants growing on it will be an investigation of the greatest possible difficulty to follow up by our younger dairy farmers. The difficulty is increased by the action of our climate on the rich soil, and by the fact that the proportions of the ash ingredients in plants is most difficult to estimate correctly. It is a research that will hardly be carried through during the lifetime of the present generation—unless the Germans come to our assistance either directly or indirectly with their scientific knowledge.

The South Coast districts were different in the period 1856 to 1866, with their salubrious and balmy atmosphere, fine skies, fertile fields, fine orchards, healthy, vigorous, productive dairy herds, magnificent scenery — important in its place as being essential to human happiness, if not an element of prosperity. In those days no part of Australia could compare even favourably with it as regards forms of animal and vegetable life. The beauty of its dairy stock, though eminently belonging to many other objects to be found there, was a prominent and apparently prevailing feature of every farm. Nor was their utility lessened by their beauty. This all arose from the fertility of the soil and the genial nature of its climate. As will be shown elsewhere, there were droughts during the decade just mentioned, but not severe ones, and crops grew abundantly. And until we can return to the soil of the South Coast all the varied elements that have been either taken or washed out of it during the past fifty years we need not expect to see the South Coast as others saw it exactly half a century ago. There are those in our midst who may contend that the soil of the South Coast is just as rich to-day as it was fifty years ago. This may be true enough in a sense, as a soil that is naturally rich in plant food will remain so provided it is compensated for what has been taken from it. But if we look around we can soon see for ourselves that low-lying flats and swampy lands have been filled up by the wash from the hills during all those years; and as the top layer of our soils contained all the humus, the formation of ages, which when washed away cannot be easily or cheaply replaced, we must conclude that our soil is only as rich as its base, as the surface has nearly all disappeared.

Before, therefore, we can recommend tenant farmers to run the risk

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

of erecting costly silos we should like to see some form of agreement between landlord and tenant by which both would be compelled, without risk of ruin—but on the other hand in the interests of each—to add to the soil that which has been ruthlessly taken away. After that we can discuss fodder conservation.

Under the heading of better systems of farming we must first ask ourselves, "Whence do plants obtain their constituents?" In the opinion of the writer the cause of soil deterioration on the South Coast has been brought about by bad farming, or in other words, farming with a disregard of the future. Many of those who have left the South Coast for other districts in the State are the first to cry out, "Oh! the South Coast districts are done." The South Coast districts are not done—they have been simply robbed of their natural inheritance by the very individuals who have the same object in view whence they have gone. Before any man can consider himself a farmer he must be led to consider the food of plants; for we must regard every substance which supply the plants with one or more of the elements necessary to the building up of its body as a means of nutriment thereto.

On this subject Hensley says:—"Plants can absorb their food only through the pores—so fine as to be altogether invisible to the naked eye—of their root fibres and leaves, hence everything which can usefully contribute to their nourishment must be either liquid or aeriform, since solid bodies cannot penetrate into their structure. The results which have been obtained as yet by investigation into the sources of supply of these nutrients furnish the following answers to the above inquiry:—

"(a) Plants obtain their oxygen and hydrogen from water, without which, indeed, it is, generally speaking, wholly impossible that they can live and thrive. In addition to this, water is indispensable to vegetation, from the fact that it supplies a medium for dissolving all those nutritive substances which cannot of themselves become fluid or aeriform, and because, moreover, its fluid constitution is the means of the formation of the solid vegetable structures; for it is from the juice made liquid by water that all the solid constituents of plants are produced.

"(b) Plants absorb carbon in the form of carbonic acid, which is a constant ingredient in our atmospheric air and spring water, and is formed in every soil that contains humus. Carbonic acid is a kind of air which is unceasingly produced in extraordinary quantities by the three chemical processes most universally diffused in Nature; we mean the respiration of men and animals, the combustion of wood, coal, &c., and the putrefaction or decay of animal and vegetable matter. It is, moreover, evolved in fermentation, and causes the effervescence and 'rising' of the fermenting mass, as likewise the sparkle of beverages not thoroughly and completely fermented, such as bottled beer, champagne, &c. Lastly, it streams forth from crevices in many places where volcanic forces are active, or, as we may conjecture, were active in former times.

"All the carbonic acid generated in these different ways is taken up into the atmosphere. If it should continue there the air must of necessity become gradually deteriorated and unfit for respiration, more especially as in all the processes of breathing, combustion, and decay free oxygen or vital air is removed from it. But this is not the case. The oxygen does not decrease, the carbonic acid does not increase. The vegetable world discharges the function, not only of a supporter, but also of a protector of animal life. It not only provides the whole animal kingdom with nourishment, but also restores again to the air the oxygen abstracted by the former. For plants absorb carbonic acid by their roots and leaves as their most important article of food, and again exhale the carbon of the carbonic acid and appropriate it to

the construction of their leaves, blossoms, seeds, and the proximate constituents contained in them.

“Carbonic acid is generated in the soil wherever plants are produced. Fallen leaves, roots remaining in the ground, and the worms and insects which feed thereon, all become as soon as life has left them the prey of corruption and decay, and by this means the carbon they contain is converted into carbonic acid. We call such decaying organic matter humus when, as very speedily happens, it has assumed a dark color. Humus, when air and moisture can act upon it, is slowly but unceasingly decomposed still further, and therefore continually furnishes fresh supplies of carbonic acid to the roots of plants as nutriment. At the same time also the nitrogenous and mineral substances which it contains become soluble and capable of being received as food by plants, and can thus in like manner be appropriated to their nourishment. The farmer is therefore quite correct in attributing to humus an especial beneficial influence upon the growth of plants, and consequently is laboring with all his energies to render his land rich in humus, especially as at the same time he makes the soil at once looser, warmer, and better suited to the absorption and diffusion of moisture, as well as stronger in the power of attracting the nutritive materials existing in the air.

“The farmer, however, must not suppose that this enrichment of the land in humus can be achieved only by directly introducing into the ground large quantities of such substances, for example, straw manure, as have especially the power to produce much humus. This end can also be indirectly attained, and frequently with far greater pecuniary advantage, by a judicious rotation of crops and the application of very strong manures—guano, bonedust, &c. Though these in themselves furnish but little humus, they produce roots, &c.

“Plants receive nitrogen chiefly through the ammonia which is produced in the putrefaction and decay of vegetable, and more particularly of animal substances. Plants are always surrounded by air, and the air consists mainly of nitrogen. Hence it might be concluded that they could never suffer from deficiency of this element for the development of their structure, inasmuch as they have the opportunity of absorbing it in any quantity from the atmosphere. And yet they are without it in many, perhaps the greater number, of fields. From the circumstance, therefore, that plants do not take up the nitrogen of the air as nourishment, we must infer that they cannot, and that pure nitrogen is not digestible and suitable as food for them. And this is a fact.

“The chemist undertakes to explain this indigestibility of nitrogen from its natural constitution. One of the distinctive characters of nitrogen is its disinclination to combine with other bodies; if this is to be accomplished it must be brought about by compulsion, for which the chemist has frequently to employ very circuitous methods. This unwillingness to give up its natural freedom seems so strong that the plant does not possess sufficient power to overcome it. Except in the atmosphere we find nitrogenous combinations only in the structure of plants and animals; and this is the nitrogen which benefits plants when after the death of these living bodies it has undergone an alteration by putrefaction and decay. The nitrogen is thereby carried over from the more complex quaternary compounds in which they exist in animals and plants, into a simpler combination. Withdrawing itself from two of these elements—carbon and oxygen—it remains in combination with the third—hydrogen—and then forms the most important and valuable nutrient of plants—namely, ammonia. By combining with acids, such as sulphuric or muriatic, or with humus, it is termed ammoniacal salts.

“There is also a second combination of nitrogen, which must be regarded as a means of nourishment of plants. This is produced when

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

substances containing nitrogen putrify in contact with bases—lime, potash, &c. By the agency of the latter the nitrogen, instead of uniting with hydrogen, combines with oxygen; and in this way nitric acid salts—nitrates—are formed, from which plants have the power of abstracting nitrogen. In this manner nitrate of lime is generated from the mortar of the walls of stables, and the nitrogen of urine upon rubbish heaps. We find nitrogen—for the most part, indeed, in small quantities—in soils and in water, sometimes in the humus, at another in the form of ammoniacal or nitric acid salts; but these are invariably derived from animal and vegetable substances which have putrefied or decayed in the earth. The more, therefore, such decaying matter is introduced into the ground, the richer will it become in nitrogen. Dew and rain water always contain ammonia, because they bring down to the earth the ammonia which has become volatile during the process of putrefaction and decay. This is why rain is almost invariably more beneficial to plant life than either spring or bore water, however free it may be of objectionable constituents.

“(d) The inorganic or mineral substances requisite to the growth of plants are conveyed to them through the soil and the water. The fundamental mass of our various soils consists of crumbled rocks, and these for the most part, except perhaps inert, siliceous sand, or pure bog earth, contain all the mineral substances which plants require for their support, although some of them in very inconsiderable quantity. In the solid rock these are insoluble in water; but Nature provides for this, inasmuch as from year to year portion of its mass is loosened and decomposed. Chemical forces, sustained by air and water, warmth and cold, plants and animals, here effect at length the reduction of solid rocks into pulverulent earth, and insoluble, into soluble salts, available for plant food.”

How Nature proceeds in order to produce from three nutrients carbonic acid, water, and ammonia, with the aid of a few mineral substances, the innumerable proximate constituents of vegetables, is a subject upon which we still know nothing—or practically nothing. The actual production of organic substances effected in these by the creative power inherent in living plants, we cannot imitate by art, although we know with certainty that it uses chemical forces for the performance of its work. On the other hand, we can imitate several of those transformations of one vegetable substance into another, such as the conversion of starch into gum, of gum into sugar, &c. In this respect, indeed, Art can accomplish more than Nature, for it can produce such combinations as alcohol, ether, and a thousand other compounds.

Nature provides, by means of rain and dew, decay and putrefaction, by physical, chemical, and volcanic forces, that the three universal articles of food, water, carbonic acid, and ammonia, shall not be wanting to the plants upon our globe; and man and brute also, without exactly intending it, contribute their share by the processes of respiration and combustion.

If we give abundant and invigorating food to an animal it becomes vigorous and fat; on scanty and slightly nutritive food it continues poor and lean. It is precisely the same with plants. If they find all the substances which they require for their nourishment and full development in abundant quantity and in suitable form in the soil and in the air they will grow up more vigorously, and put forth more shoots, leaves, flowers, and fruits than when they meet with these substances, or even only one of them, in insufficient quantity. By rich and abundant food the farmer fattens his plants; by rich and abundant food he also fattens his cattle. The only difference between the plants and the animals is that the former has but a small range to seek its food, whereas the latter has the power of roaming over the greater portion of the paddocks where they are permitted by their owners to graze.

CHAPTER XVIII.

ON THE SILO.

There is a very old adage which enjoins us to prepare for war in time of peace; and another which goes to show that we should always be on the watch in time of plenty to provide for the time of drought.

Speaking of the dairying centres of the South Coast and table-land districts of New South Wales, the whole aspect of the country convey the impression of having been subject to cycles of extreme moisture and drought, extending through considerable periods, the alteration producing remarkable changes in the general appearance of the country. Thus 1836-8-9 were terrible droughts. Owing to the heavy timber the streams of water were not numerous on the coast. Since the clearing of the timber off the coast lands numerous streams came into existence. Oxley, in 1817, found several inland lakes which he named. When one or more of these were sought by Mitchell in 1836, they were for the most part extensively grassed. On some of the early maps Lake George is marked, extending into the counties of Argyle and Murray. In 1828 it was a fine sheet of water, seventeen miles in length and seven in breadth. But it was without fish, and surrounded by dead trees of the eucalyptus species, some of them two feet in diameter, which also extended into it. It is said the natives remembered the time when the whole was a forest, a statement supported by the lifeless trees in its bed. In October, 1836, the entire lake was gone; and its basin was a grassy meadow, similar to the adjoining Breadalbane Plains!

If we consider the original, or black inhabitants of Australia, they had no homes, lived a wandering life, the females carrying their young on their backs; the wild animals were either pouched or great runners, thus being able to go long distances in search of food and water without inconvenience. The emu has been at all times considered monarch of the interior of Australia, where the drought conditions have obtained. An Australian poet thus muses:

AUSTRALIA.

Far, far beyond, prolific region spread,
Where whispering winds have made their balmy bed,
Disturb'd but by a Leichhardt's daring tread!
A broad oasis spreads its vesture fair,
And smiling verdure reigns triumphant there.
Luxuriance crowns the various plains with grass,
Whilst streams, meandering, gently sweep between.
O'er his dominion the emu wanders wild,
And deems himself fond Nature's fav'rite child;
Bears his high head and o'er each wavy chain,
Shoots his bright gaze, the monarch of the plain.
Yon barren desert's broad and drear expanse,
Checked the bold Sturt and dar'd him to advance;
Awed with its sterile majesty of space,
And warn'd him backward from the fatal place.
Thou embryo Empire! When the glorious land
From which thou'rt sprung shall be a desert strand
For pilgrim feet, in classic mood, to trace.
A greatness Time itself will ne'er efface:
When generations yet unborn shall rise,

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

And rear thy temples to the sunny skies:
Religion, Freedom, mingling in the strain.
That chaunts thy praises and that lauds thy names;
Then, boastful, tell thy children whilst they're young,
It was from Britain that thy fathers sprung!
And, should base slander breathe upon her name.
Rise, Briton-like, and vindicate her fame:
Tell of her deeds, and show the world by them,
That Britain's virtues in Australia shine!

S.P.H., Sydney, November, 1847.

A succession of deep depressions is a very common arrangement in the structure of the beds of the Australian creeks and rivers. This is obviously the provision of an all-wise Creator, meeting the conditions of a country where the water rapidly run off the surface, and which was inhabited by native tribes of little constructive capacity. They act as natural tank or reservoir, retaining a supply of the vital element long after it has disappeared from other parts of the channels, giving them the appearance of a chain of ponds. It was from observations made by Professor Strzlecki, a Polish scientist, on the formation of the ponds that led the early settlers to adopt the construction of dams for water conservation.

It would appear that even terrific thunderstorms come around according to some well-arranged (?) cycle, disappearing for a period of years, and then returning to us again for a term of years. If we can trust our memories, there were periods in our lifetime when the visitations of such storms were more numerous, and much more vivid, than of late years. As a writer puts it: "The repeated flashes of lightning rendered darkness visible. The coruscation and lurid glare made it appear as if the atmosphere was on fire. The air was tainted with sulphuric smell; the loud and rapid peals of thunder, reverberated from hill to hill, seemed like the artillery of heaven let loose to accomplish Nature's dissolution. This war among the elements was succeeded by torrents of rain, which continued throughout the night."

A salubrious and balmy atmosphere, fine skies, fertile fields, are all very well in their way; but as has been seen, serious spells of drought must be contended with. In order to do this the people must resort to the conservation of fodder for their stock, and as ensilage seems to fit in very well occasionally, why not generally?

So far as our history can prove anything, it certainly proves that the normal condition of Australia is drougthy. Someone has said that "Our Australian dairymen had but two prayers, one for rain, and one for dry weather; and as they had prayed so often for rain and so seldom for dry weather, that their dry-weather prayer was entirely forgotten." These constant, continuous seasons of drought as compared to the limited spells of wet weather experienced on the South Coast and tablelands, have been the means of inducing many to advocate the conservation of fodder by means of ensilage. During the past thirteen years the dairy farmers directly and the community indirectly, have been greatly the losers through the prevailing indifference to the conservation of fodder in sufficient quantities to tide them over long spells of drought.

Some argue in a mild sort of way that silage, however inferior the quality, is better than many sorts of hay; others go so far as to state that good silage is better for stock than good hay, inasmuch as in silage all the natural juices of the plant is preserved, whereas in the process of curing hay these juices are transformed into solids, and are thus lost to the animal, unless other constituents rich in oil are added. Practical experience, on the other hand, go to show that, generally speaking, ensilage is by no means

ON THE SILO.

a complete fodder, requiring special concentrated foods to cause a continuous flow of rich milk. On these points hinge the essential qualities of silage versus hay.

But there is this to be said in favour of silage: It can be made from our most productive fodder crops, and in weather not altogether suitable for hay-making. Take, for example, broadcast maize, it is a large productive crop, and most suitable for silage, not so for hay.

In touching upon the crops for silage, at the outset it is well to remember that the silo has no inherent power by which it can convert worthless, innutritious materials into valuable stock feed. If we put good fodder in the silo, it may come out less valuable than in its original state; but it can scarcely be better. In other words, is a means of preserving fodder, and not for adding nutritive value to it. Among all the crops generally grown as stock food, experience points to maize as the best for silage making, and the next best is the natural grasses of Australia. Other crops, such as the sorghum family, may give larger yields; but if we consider the nutritive value of maize, and that of our natural grasses, we must obtain good results. Lucerne, oats, barley, wheat, and, indeed, all good forages, may be preserved by the use of the silo, and farmers will often do well to utilise any or all of these for silage making, as suits their convenience.

The secret of success in corn growing everywhere is to be able to keep the ground clean and mellow, without having to resort much to the use of hand labour. The successful maize-grower makes the horse team furnish the muscle required in making the crop. This is true whether the object of the crop be silage or grain. That practical experiment has operated against the universal adoption of silage, cannot be entertained, nor can it be shown that moist countries can produce any better silage than dry ones; yet it seems to be very slow in taking its place among our system of producing cow-foods.

The farmers of this country have been experimenting with the manufacture of silage in order to produce a food for their dairy cattle that will remain for years, if necessary, in a sound succulent condition; and in carrying out these experiments, they have not as yet adopted any definite system. They seem to be, however, more unanimous on this point, namely, the finer the ensilage is cut, the closer it packs in the silo, and then the silo holds more, and keeps better. It can, nevertheless, be cut too fine, and from one-half to three-quarters of an inch is quite long enough.

It has been estimated that one cubic foot of silage, as it is in the silo, weighs from 35 to 40 pounds. A cow when fed with a quantity of grain will eat daily not much more than one cubic foot of silage. When no grain or other feed is used, the daily consumption of silage per cow will run up to 50lb or more; some cows, of course, consuming proportionately larger rations. These figures, though approximate, will enable the farmer easily to estimate the capacity of the silo and the acreage of the fodder that needs to be ensilaged, in order to feed his stock.

At present we have silage pits, silage rooms, silage stacks, sweet silage and sour silage. The actual result, however, aimed at by all experimentalists is the discovery of means of treating silage is that of assisting nature in the digestion of cow food outside the stalls, and before the food enters the stomach of the cow. Silage making according to this theory certainly aims at a more perfect assimilation of the food.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Scientists tell us that heat is produced in the silage owing to the rapid union of the oxygen of the air with the combustible atoms of the fodder in the stack, pit, or room, consequently the object of admitting or excluding by controlled pressure or closeness in packing, the air from the confined fodder is to regulate the temperature of the mass at will, so as to produce either sweet or sour silage or ensilage in a partly assimilated form.

When the carbo-hydrates, so called because they contain, in addition to carbon, hydrogen and oxygen in proportion to form water, and the cellulose which forms the solid substance of most plants in their green state, and which is not soluble in water, but dissolves in a weak acid), gets overheated and burns in the stack, or pit, or room, the hydrogen and oxygen being in proportion, in the one, to form water, creates a volatile vapour; while the carbon combines with oxygen from the air forming carbonic dioxide, commonly called carbonic acid. The farmer has, therefore, to guard against overheating and the formation of too much acid. As it is impossible to exclude all the air from the silage mass, there must be continual combustion going on within the mass from month to month until in time the whole mass would be consumed. "Now, according to this theory, silage would not keep for any length of time, whereas instances are frequent where silage has been kept in a wholesome state for a number of years, which goes to show that once the generation of carbonic acid is arrested in the mass it may remain in the same condition for many years.

As the heating and chemical changes in the fodder are mainly due to the oxidising action of the living substances of the cells of which the plants making up the fodder are composed, it was thought, if pressure was put on the mass immediately, this living substance requires to take its oxygen out of the other cell contents, the air being shut out as a source of supply, the desired condition of the silage could easily be controlled. We have had many disappointments, however, where much success was looked for, and many successful experiments have been carried out under the most careless conditions.

These object lessons, however, do not disprove the theory so often expounded, namely, that when the heat increases very gradually and the matter of the fodder goes through the various stages of starch, sugar, alcohol, and acetic acid, no matter whether the mass be in a pit, stack, or room, good results invariably follow. But it must be remembered that it is the acid which gives the sour taste to silage, which stock soon begin to relish; it also conveys a peculiar taint to milk. There is one advantage to be gained by making sour silage; that is, it will keep for a longer period of time in a wholesome state after being cut out of the mass than any other form of silage, which is important. In this case the temperature of the silage should not be allowed to go above 120deg. Fahr.

On the other hand, sweet silage is made by putting on the pressure for a short time so as to allow the temperature to rise to 140deg. Fahr. Once above 130deg. Fahr., the heat kills the cells when they by chemical change have formed sugar, and before they have time to form acetic acid. If the heat is allowed to rise above 150deg. Fahr., the silage becomes burnt and disagreeable. We therefore should expect to see the best silage made at a temperature of 130deg. Fahr., which is theoretically the happy medium between sour and sweet silage. The figures would then range as follows:—120deg., sour silage; 130deg., slightly acid silage; 150deg., sweet silage. The color of the sour silage should be an orange green, and the sweet silage should be a dark-brown color.

But these rules cannot be depended on at all times; they are merely a guide on which to work in order to arrive at the best

ON THE SILO.

practical results. According to the material at hand and climatic conditions, there are certain to be slight variations to all rules.

Fodder grown under crowded conditions, where the sunlight cannot reach it, is not by any means so valuable as a cow food as fodder grown in the sunlight and under full conditions. It is also better to grow heavy yielding fodders in order to economise labor in cultivation and handling. In this respect the lighter sorghums and the heavier variety of maize will be found suitable and much more profitable than lighter crops. Take, for example, 20 acres of "Planter's Friend," which is one of the sorghum family and a heavy yielder. Put the rent of the land down at 30s. per acre for six months, is £15. Ploughing, sowing, and seed at 30s. per acre is £30. Cutting, carting, and stacking at 35s. per acre is £35; incidental expenses, say, £10. We have a total expenditure of £90, which is a liberal allowance. Against this we have 20 acres of "Planter's Friend," yielding at the rate of 20 tons of green food, which is equal to 400 tons at a cost of 4s. 6d. per ton. Maize, on the other hand, at the rate of 10 tons per acre, or a total of 200 tons, which would cost much less to harvest, but of much better feeding value per ton, could be conserved at the rate of 4s. per ton, which is very important and worthy of notice.

Conceding that the system of silage which has been described will preserve fodder in a comparatively fresh state, the chief question at once asserts itself: "How shall this process be applied to general stock feeding in order to make a complete system by which animals may be grown, yield milk, and be fattened?" As Stewart says:—"Ensilage, as generally discussed in this country, has been used to signify preserved green corn. This single food is quite inadequate for the complex wants of the animal system. It is deficient in albuminoids to nourish the muscular system, and deficient in the phosphates to build the bones. Yet it is a very valuable ingredient in the ration of animals because of the large weight grown upon an acre, and because it is relished by all farm animals. A complete ration for dairy cows is 40lb. corn silage, 5lb. of bran, and 5lb. of gluten food." Much, however, will depend on the quality of the silage and the animal.

In many districts where the farmers cannot afford to erect costly silos, or even to purchase the necessary appliances for stocking under high pressure, they simply build an ensilage stack after the style of a haystack, being very careful to keep the top of the fodder, whatever it may be, on the outer part of the stack to the outside. These tops act as a shield against heavy rain, and as these tops become dry they form into hay and protect the main body of the stack from loss. When the stack is completed about 2ft. of straw is placed on top, then sheets of old iron, and finally weighted with logs. It is said that the waste sustained by this process of stacking is very small indeed, and its adoption is often urged as a system of conserving fodder by some of our most practical farmers, who have adopted it themselves.

It must, however, be borne in mind that both failure and success seem to follow almost any system of making silage. Whether it be the happy-go-lucky style which some farmers adopt through life or not, the fact remains that reports are being constantly circulated by the farmers of these failures and successes throughout our dairying districts. But the main complaint is that only but a very few farmers adopt any system of conservation of fodder. The fault of this is no doubt largely due to the lease system of our dairy farming districts. Therefore, there is a remedy, if the farmers will use it.

In any district where the pasture grasses are of such a nature as to afford too much fodder during the summer months and little or none in the winter months, it must be patent to any dairyman that

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

a system of conservation must be adopted in order to keep up an average supply of fodder through the winter. Once upon a time the dairymen used to save up paddocks for winter supply. This system—good in itself—cannot be depended on nowadays, hence it is that silage appeals to every man as being the correct thing under the circumstances. It is also plain enough to all reasoning beings that if one dairy farmer can make a success of ensilage growing many others could do likewise.

CONCLUDING REMARKS.

When considering the birth and development of New South Wales generally I have endeavored to take as lofty a view as possible of the many shades of opinion possessed by the early pioneers in their laudable endeavors to make homes for themselves and their families in this land of their either forced or voluntary adoption, and have rendered to all that justice which is due to them so far as my humble abilities serve me.

When attributing, however, the cause of neglect to those valuable types of dairy cattle that had obtained in the forties and fifties to the beef craze that set in during those years immediately following the discovery of gold, it must be distinctly understood such a statement as that is not sufficiently far-reaching to cover the whole situation, as a large portion of the evil must be laid at the door of those who in the past, as in our own time, are only too prone through, possibly, the old human inheritance of perseverance to fall in line blindly with every fad and fancy that may catch their eye or their ear.

The reader may have observed that the prevailing idea of this work is this: Before modern breeders of dairy cattle entered upon their business there were scores of breeders in the counties of Cumberland, Camden, St. Vincent, Argyle, Murray, and Auckland who bred types of dairy cattle assisted of course by new and extremely rich pastures and a variety of climates, far and away superior in quality and constitution to those we possess to-day in any part of Australia. I am aware that a multitude of questions which will be presented to my readers after perusing the pages of this book. I can, however, assure the reader of this fact: I am not aware that, in any chapter of my book I have laid down erroneous propositions, or expressed myself in ill-sounding terms by bearing false witness.

It has been abundantly proved in the course of this work that the great majority of writers on the origin of our dairy herds during the past twenty years were either ignorant of the origin of our cattle, or held back for prudential reasons the real facts. Speaking from twenty-five years of experience in collecting books and data on the history of cattle, particularly the dairy cattle of New South Wales, the writer can from the fulness of his heart sympathise with those who possess a similar ambition. But on the other hand, one cannot have anything but the most abject contempt for the fellow who will wait until all the facts of the case are laid bare before him and then set to and criticise a work of which he had been previously ignorant or practically so, from the standpoint of an author.

That New South Wales has made wonderful strides since its foundation in 1788, as shown in these pages, does not by any means show that this great country has reached the limits of those gigantic leaps of advancement. It is estimated that in 1825 we had 134,519 head of cattle in the country; in 1842 we possessed 897,219 head; in 1851 there were 1,738,965; in 1861 these numbers had increased to 2,271,923; but in 1871, owing to the large areas of country being converted into sheepwalks, the number of cattle had decreased to 2,014,888. Pleuro-pneumonia also played havoc among the cattle herds during the decade 1861-71 and in 1873, by an Act of Parliament, importations of cattle from overseas countries were prohibited.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

According to our latest returns for New South Wales, 1908, there were in this State 775,491 dairy cows and 2,175,454 head of cattle under the miscellaneous heading "All Others." The returns show that from those 775,491 dairy cows 61,376,700lb. of butter and 4,817,900lb. of cheese was produced. Apart from these figures there were 9,486,522lb. bacon and hams which may to a great extent be placed to the credit of the utilisation of the skim milk of the farms. Unfortunately there is nothing definite regarding the pure milk trade of the State.

It may not be out of place here to make reference to the social conditions of our dairy farmers. Mr. Frank J. Donohue, writing in a book published by authority, entitled "New South Wales, the Mother Colony of Australia," says:—"In considering the conditions under which our population lives, the first fact to strike the observer's attention is the decided preference shown for town life." This is quite true, but the evil lies in the fact that life on the dairy farms becomes very monotonous to the average boy or girl, who can see nothing ahead from sunrise to sunset, or to use the common bush phraseology, "from jackass to jackass," but constant plodding, with little or no variety of occupation for either mind or body. They are not slow to see that the boy or girl in an office working with starched collar and cuffs eight hours a day only is better off at the end of life in the majority of cases.

Mr. Donohue also tells us:—"There are no striking extremes of wealth and poverty in New South Wales." In this he has been very much mistaken. These extremes may not be so marked as in older countries. We have, however, in the past laid the foundations firm and deep to bring about social evils of the very worst kind in this State. We have allowed the few to grab all the best lands of this country, and permitted the various Governments to protect these gigantic landholders to such an extent that in every instance before these estates are thrown open for closer settlement the prices have been forced up till the smaller settlers, who are mostly dairy farmers, can only exist by making partial slaves of their families.

No one can expect to dodge the law of rent or interest. As Mr. Sidney Webb puts it:—"Every development towards a freer individualism must, indeed, inevitably emphasise the power of the owner of the superior instruments of wealth production to obtain for himself all the advantages of their superiority." Again, Mr. Bernard Shaw says:—"As the agricultural industry is typical of all industries, it will be seen that prices do not rise because worse land is brought into cultivation, but that worse land is brought into cultivation by the rise of prices." Now, this is practically the case with the dairying industry. Prices have advanced, and those who have rich tracts of land are reaping a rich reward, whereas others have been forced, by circumstances to attempt to carry on dairying operations on lands altogether unsuitable for the purpose. Thus it will be seen that those unfortunates who have to struggle on these poor, ungenerous lands are doing but little to help themselves, whilst at the same time they are forcing up the value of the land locked up in big estates.

We, of course, talk of the avarice which is so prevalent nowadays; but look at the usurers of antiquity who sucked the blood of the people everywhere; read the satirical poets, and we at once see what was the state of manners on this point; consult, in fine, the annals of history, and we will observe what pains our moral guides took to diminish these vices. If we read the history of ancient Rome we will find the cursed thirst for gold, and lenders without mercy, who, after having impudently robbed, carried in triumph the fruits of their rapine to live with scandalous ostentation, and buy votes again to raise them to command. However, it cannot be denied that,

CONCLUDING REMARKS.

generally speaking, reason and justice prevail in the public conscience of this country. That being so, we have hope for the future of dairying.

This is not the place to enter into details on this matter, or numerous proofs might easily be adduced in support of the foregoing observations. A comparison, however, between the clearing lease system that had obtained during the forties and fifties and the more advanced systems of dairying under the Land Act of the late Sir John Robertson of 1861, and our more modern system of closer settlement must at all times form chapters of interesting reading for those whose ambitions lead them towards any scheme which may be propounded for the betterment of the man on the land.

In conclusion, I wish to quote a notable writer: "The means of saving a nation, by delivering it from interested protectors, and of securing her real independence, are to be found in great and generous ideas deeply rooted in the people; in feelings engraved on their hearts by the action of time, by the influence of powerful institutions, by ancient manners and customs; in fine, in the unity of good thought, which makes a whole people as one man. Then the past is united with the present, the present is connected with the future; then arises in the mind that enthusiasm which is the source of great deeds; then are found disinterestedness, energy, and constancy; because ideas are fixed and elevated, because hearts are great and generous."

Let us, then, look towards the future of this great country, as the same learned author puts it: "Do you not see Nature herself so varied, so rich, so grand, lavish her treasures in disorder, hide her inestimable precious stones and her most valuable veins of metal in masses of earth? See how she presents huge chains of mountains inaccessible rocks, and fearful precipices, in contrast with her wide and smiling plains. Do you not observe this apparent disorder, this prodigality, in the midst of which numberless agents work, in secret concert, to produce the admirable whole which enchants our eyes and ravishes the lover of Nature? So with society; the facts are dispersed, scattered here and there, frequently offering no appearances of order or concert; events succeed each other, act on each other, without the design being discovered; men unite, separate, cooperate, and contend, and nevertheless time, that indispensable agent in the production of great works, goes on, and all is accomplished according to the destinies marked out on the secrets of the Eternal."

Yours faithfully
Frank W. Caffrey

**The Coastal Farmers' Co-operative
Society, Limited.**

**Head Office : 374-376-380 SUSSEX STREET,
SYDNEY.**

Wholesale Distributing Branches at—

**WOLLONGONG, GOULBURN, NEWCASTLE,
NORTH SYDNEY, and ASHFIELD.**

Absolutely the **LARGEST** genuine Co-operative Institution in the State.
Owned and Controlled solely by Farmers.

All surplus profits (after paying legitimate working expenses) are returned
annually to Consignors in the form of a **BONUS**.

In **EIGHT** years this Cash Refund totals **£25,461**.

The whole Business Conducted under a TRUST Account.

TURNOVER for the 12 Months ended 30th September,
1908, reached the magnificent sum of

£742,536.

The Society receives more **BUTTER, EGGS, CHEESE,**
and **MAIZE** on consignment than any other firm in Syd-
ney.

— C. E. D. MEARES, Manager

THE
**GREYSTANES STUD
OF AYRSHIRES.**

(20 MILES FROM SYDNEY.)

Largest Herd of
PURE AYRSHIRES
in Southern Hemisphere.

IMPORTED BULLS AND COWS.

All Animals Eligible for Stud Book.

The blood represents those famous strains so well
known in Australia as some of the heaviest Milking
Ayrshires.

GREYSTANES STUD OFFICE,
Hunter Street, Sydney.

APPENDIX

I.—HERD BOOK TESTS.

II.—COOLANGATTA STUD DAIRY CATTLE.

III.—PEDIGREES, Etc., OF CATTLE ILLUSTRATED.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

BERRY HERD BOOK TESTS.

Conditions : Largest Yield of Milk for Three Consecutive Milkings.

Owner's Name.	Address.	Year Month.	M.	E.	M.	Total Yield lbs.	Name, Age and Breed of Cow.
Jas Gallagher	Little Meadow, Meroo	1885	17	17	18	70	Beauty, 4yrs., sire Major bull, dam Ayrshire cow
Michael Reynolds	Jasper's Brush	1885	2	2	3	74 $\frac{1}{2}$	Florric, 9yrs., sire Major bull, dam Macpherson cow
Daniel Boyd	Broughton Vale	1885	3	3	4	91	Nugget, 3 $\frac{1}{2}$ yrs., district breed
Henry Fredericks	Kiama	1885	13	13	14	76	Model sire Baronet, dam Jersey cow
Daniel Boyd	Broughton Vale	1885	9	9	10	80	Nell, 6 $\frac{1}{2}$ yrs., sire and dam Scotch Jock strain
James Bros.	Gerringong	1885	16	16	17	74 $\frac{1}{2}$	Eliza, 8yrs., sire Robin Hood, dam Scotch Jock strain
James Bros.	Gerringong	1886	1	1	2	69 $\frac{1}{2}$	Rosie, 6yrs., sire Robin Hood, dam Major cow
James Bros.	Gerringong	1886	1	1	2	70	Princess Alice, 5yrs., sire Robin Hood, dam Scotch Jock cow
Daniel Boyd	Broughton Vale	1886	1	1	2	67	Handsome, 4yrs., sire and dam Scotch Jock strain
Daniel Boyd	Broughton Vale	1886	22	22	23	89	Dolly, 4 yrs., sire and dam Scotch Jock strain
Jas. Sharp	Gerringong	1886	7	7	8	82 $\frac{1}{2}$	Pet, 7yrs., Durham and Ayrshire cross
Jas. Sharp	Gerringong	1887	31	31	1	91	Queen, 8yrs., Durham and Ayrshire cross.
Daniel Boyd	Broughton Vale	1887	5	5	6	86	Sally, 6yrs., sire and dam Scotch Jock strain
Jas. Knox	Bundawalla	1887	27	27	28	80	Strawberry, district breed
Daniel Boyd	Broughton Vale	1887	25	25	26	75	Model, 5yrs., sire and dam Scotch Jock strain
Daniel Boyd	Broughton Vale	1890	25	25	26	106	Handsome, sire and dam Scotch Jock strain
Wm. Sharp	Gerringong	1889	21	21	22	84 $\frac{1}{2}$	Buttercup, district breed
Daniel Boyd	Broughton Vale	1889	1	1	2	93 $\frac{1}{2}$	Violet, 3 yrs., sire and dam Scotch Jock strain
James Bros.	Gerringong	1889	27	27	28	93 $\frac{1}{2}$	Alice, 6yrs., sire Robin Hood, dam Major cow
Daniel Boyd	Broughton Vale	1890	21	21	22	94 $\frac{1}{2}$	Nugget 2nd, 6yrs., sire a id dam Scotch Jock strain
Daniel Boyd	Broughton Vale	1890	11	11	12	69 $\frac{1}{2}$	Nugget, 7yrs., sire and dam Scotch Jock strain
Daniel Boyd	Broughton Vale	1890	11	11	12	86	Mousey, 5yrs., sire and dam Scotch Jock strain
Daniel Boyd	Broughton Vale	1890	11	11	12	95 $\frac{1}{2}$	Violet, 4yrs., sire and dam Scotch Jock strain
Wm. Hanlon	Broughton Village	1891	27	27	28	111 $\frac{1}{2}$	Pet, 5yrs., breeding unknown
John Lindsay	Kembla Park	1892	27	27	28	100 $\frac{1}{2}$	Honeycomb, Ayrshire-Durham cross
John Lindsay	Kembla Park	1893	4	4	5	124	Honeycomb, Ayrshire-Durham cross

APPENDIX.

KANGAROO VALLEY HERD BOOK TESTS.

Owner's Name.	Address.	Year.	Milk in lbs. for 30 Days.	'Test.	lbs. Value of Butter of at 9d per lb. and Butter surplus milk at per gall. ¼d.	Cow's Name and Breed.
Geo. Tate	Kangaroo River, K.V.	1899	1680	3.2	58.89	£2 7 6½ Name unknown, district breed
Geo. Tate	Kangaroo River, K.V.	1899	1312½	4.	58.26	2 6 3½ Name unknown, district breed
Wm. Graham	Barrengarry	1899	960	4.4	47.28	1 17 4 Name unknown, district breed
Geo. Tate	Kangaroo River, K.V.	1900	1980	4.	87.77	3 5 9½ Lucky, Durham and Ayrshire
Geo. Tate	Kangaroo River, K.V.	1900	1785	3.9	77.67	3 1 9½ Dairymaid, Durham and Ayrshire
Geo. Tate	Kangaroo River, K.V.	1900	1485	3.6	58.07	2 3 6½ Cherry, Durham
Jas. Chittick	Kangaroo Valley	1900	1350	3.4	50.03	2 0 5½ Pearl, Durham
J. T. Maynes	Barrengarry	1900	1320	4.5	67	2 12 10½ Magpie, Holstein
Wm. Graham	Barrengarry	1900	1620	2.8	48.81	1 19 10½ Blossom, Durham and Ayrshire
Geo. Tate	Kangaroo River, K.V.	1901	1650	4.8	88.30	3 9 5½ Lucky, Durham and Ayrshire
Geo. Tate	Kangaroo River, K.V.	1901	1860	3.5	71.46	2 17 3½ Cherry, Durham
John King	Barrengarry	1901	1380	3.9	59.54	2 7 4½ Lovely, Durham and Ayrshire
John King	Barrengarry	1901	1530	3.5	58.71	2 7 0¼ Blanche, Durham and Ayrshire
Jas. Chittick	Kangaroo Valley	1901	1320	4.	58.39	2 6 7½ Daphne, Durham and Ayrshire
Jas. Campbell	Kangaroo Valley	1901	1260	3.8	53.63	2 2 8½ Brindle, Jersey and Ayrshire
John Nelson	Bendeela, K.V.	1902	1140	4.4	56.02	2 4 3 Brandy, Jersey-Shorthorn cross
P. H. Morton	Barrengarry	1903	1785	3.8	75.60	3 0 7½ Pearl, Major strain
Geo. Tate	Kangaroo River, K.V.	1903	1770	3.7	72.30	2 17 8½ Lucky, Durham and Ayrshire cross
Christopher King	Kangaroo River, K.V.	1903	1500	3.7	61.50	2 9 1¼ Favourite, Durham-Ayrshire cross

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

COOLANGATTA STUD DAIRY CATTLE.

Coolangatta, far-famed for its meadows and its live stock, has been associated through many years with the development of high-class cattle. The great stud farm, lying between the sea and the steep coastal range of hills, is perfectly adapted for breeding and rearing animals calculated to raise the standard of quality in their kind the world over. The impress of the stud stock from this Shoalhaven estate is strongly apparent in many Australian herds, but this influence may, unfortunately, be greatly decreased in the immediate future. Subsequent to the death of the late Mr. David Berry, Dr. John Hay, having a keen sense of the immense service that may be rendered to tenants by an enterprising landlord, decided to considerably increase the pedigree dairy herds of Coolangatta. Not only the numerous tenants on the estate were considered in arriving at this decision. The chief industry of the South Coast being dairying, it was most essential that the farmers should have cattle placed at their disposal at reasonable prices which would improve their milking herds. Pure bulls of first-class quality were of late years badly needed on the coast, and Dr. Hay had this and the interests of his tenants in the immediate outlook when he began to import valuable pedigree stock. Jerseys were brought from the Channel Islands and England, and Ayrshires from the best herds in Victoria and New Zealand. Later on, Holsteins and Shorthorns of the milking strain were strengthened by importations from Holland and England, and a very fine lot of cattle of almost all dairy breeds was established in the Coolangatta stud stables and paddocks.

The Ayrshire here, as elsewhere, has proved itself the most reliable of the dairy breeds on all classes of country and in all seasons. Mainly for this reason the Ayrshires were always the leading stock at Coolangatta; in fact, it is not too much to say that the herd was the greatest in every respect in Australia. In 1890 Dr. Hay founded the new Coolangatta Ayrshire herd with ten cows and a bull bred by Mr. K. B. Ferguson, of Dunedin, New Zealand. These cattle turned out well, and it was decided that the next infusion should be of Victorian stock. Selections were made from the celebrated Mount Fyans herd of Messrs. Cumming and Brisbane, a herd founded and maintained solely on importations direct from the best studs of Scotland. Among the first purchases were Yellow Bess of Fyans, by Rantin' Robin (imp.); Olive of Teviot, by Baron 2nd of Drumlanrig; Drumlanrig's Heiress 4th, by Heir of Drumlanrig from Drumlanrig's Ada 4th. Following on this the herd was further improved by additions from Mr. S. Hordern's herd, and also from that of Mr. John Grant, of Invercargill, New Zealand.

It was in 1896 that the Mascotte of the Coolangatta Ayrshire herd arrived. In that year Dr. Hay purchased Rob Roy (bred by Cumming and Brisbane), by Rantin' Robin of Hindsward (imp.) from Favourite of Munnoch (imp.). Favourite was thrice champion of Australia, and a perfectly shaped Ayrshire cow of most aristocratic lineage.

From 1896 forward the Coolangatta herd was strengthened by purchases from W. McNab & Bros.' Oakbank herd, Victoria, and from the herd of Mr. John Bond, of Victoria. Two very beautiful McNab heifers by Rarity were purchased, and this year Dr. Hay secured, for 100 guineas, Lustre of Oakbank, a cow of rare quality.

The demand for Coolangatta Ayrshires has grown sufficiently large and pressing of late years to seriously embarrass the management. The agents of South Africa, Japan, and other countries have added considerably to the ever-growing local calls upon the herd, and Dr. Hay decided that very large increases should be made in the stud stock. As a preliminary he purchased, in Scotland Prince Emerald, a bull with an unbeaten record, gained at the leading Scottish shows. Prince Emerald is a sire of remarkable character, a big, deep-bodied

APPENDIX.

bull, wonderfully good behind the shoulder, and having a majestic fore-end.

Arrangements were begun for importing a number of high-class heifers from the leading studs of Scotland and England. Mr. W. J. McVeigh was engaged in selecting these cattle for Coolangatta, when an opportunity presented itself for making the herd premier of Australasia at one stroke. Messrs. W. McNab & Brothers, of Oakbank, Victoria, placed under offer the whole of their celebrated Ayrshires, comprising 218 Stud Book cattle. The Oakbank Ayrshire herd, founded over fifty years ago by the late John McNab, was probably unequalled in the world, and was decidedly the most valuable stud in Australasia. During the past fifteen years thirty-two championships have been added to the Oakbank escutcheon, and almost all of these were won at the Royal Shows of Melbourne and Sydney. To its credit, also, are many milking and butter test competitions, and a number of Brassey and other medals for the best dairy cows exhibited. For many years at Melbourne Royal Shows the Oakbank Ayrshires and their progeny have carried off the most coveted awards, and these cattle have recently been very successful at Sydney Shows.

Throughout the pages of this book mention has been made of the influence of the sire on the outward characteristics or general appearance of his progeny, and perhaps we might search the annals of history in vain for a more striking example than that of Jemmie of Oakbank. Wherever the progeny of this bull have gone they carry with them the stamp of old Jemmie. It matters not which part of the Commonwealth a show of dairy cattle is being held, the judge or judges, as the case may be, are confronted with animals bearing the same characteristics as the old bull, which goes to show how type can be concentrated by intelligent mating of sires and dams in a few years' time into one superb animal.

Since the above extracts were penned, Dr. Hay was knighted (in 1908), and a few months later he passed peacefully away at his private residence, Crow's Nest, Sydney, much regretted by all who knew him well. Immediately after the demise of Sir John Hay the Coolangatta stud herd of Ayrshires were sold by auction at Berry, when that valued collection of stud animals were dispersed throughout the Commonwealth.

The foregoing facts have been largely taken from a descriptive account of Coolangatta written by an expert, which appeared in a leading Sydney paper.

PEDIGREES, Performances, Etc., of Cattle Illustrated.

Fussy II.

Fussy II., bred by Messrs. McGill Bros., Croome, Shellharbor, New South Wales. (See pages 16 and 141.) "Fussy won first as dairy cow, also champion cow, three years in succession at Kiama Show, also many other prizes too numerous to mention in this short sketch. Of course, we could go very much further back with those pedigrees, but it is not necessary. (Signed) H. Dudgeon."

Fuchsia.

Fuchsia, light roan, 3 years old, bred by and the property of Mr. E. J. Marks, Terragong, Jamberoo. Sire Emperor, dam Gladys, Shorthorn-Ayrshire cows. One of a pen which won first prize for best pen of dairy cows, any age or breed, at Kiama Show, 1909.

Betsy.

Betsy, roan, 8 years old, bred by and the property of Mr. E. J. Marks. (See page 95.) Illawarra strain. One of a pen which won second prize for best pen of dairy cows, any age or breed, Kiama Show, 1908.

Bulls Emblem and Banker II., Cows Melba and Oonah.

Two bulls and two cows bred by and the property of the Scottish Australian Investment Co., Ltd. They were bred from Illawarra cattle under the management of Mr. J. T. Cole, on the cold, bleak, and often extremely ungenerous climate peculiar to certain parts of the far-famed Monaro—to wit, the Bolaro Estate. Nevertheless, these animals have been exhibited from time to time at the Royal Show of Sydney with consistent success before being located at their present home, Darbalara, Gundagai.

Bull Banker II., color light roan (see page 101), sire Banker (No. 5 M.S.A. of N.S.W. H.B., Vol. 1), dam Rose (No. 6 M.S.A. of N.S.W. H.B., Vol. 1).

Cow Oonah II. of Darbalara, color roan (see page 101), sire Tarquin (No. 70 M.S.A. of N.S.W. H.B., Vol. 1), by Banker (No. 5), dam Dolly (No. 159 M.S.A. of N.S.W. H.B., Vol. 1), dam Oonah (No. 522 M.S.A. of N.S.W. H.B., Vol. 1), by Abram (No. 1 M.S.A. of N.S.W. H.B., Vol. 1). First at Sydney R.A.S., 1909, M.S. cow 3 and under 4 years old.

Bull Emblem of Darbalara, color roan (see page 100), sire Banker (No. 5 M.S.A. of N.S.W. H.B., Vol. 1), dam Madame (No. 406 M.S.A. of N.S.W. H.B.), by Heather (No. 27 M.S.A. of N.S.W. H.B., Vol. 1). First at Sydney R.A.S., 1907. Second at Sydney R.A.S., M.S. bull) and under 4 years. 1909.

Cow Melba, color roan (see page 100), sire Banker (No. 5 M.S.A. of N.S.W. H.B., Vol. 1), dam Madame (No. 406), by Heather (No. 27 M.S.A. of N.S.W. H.B., Vol. 1).

Bull, Aristocrat of Oakdale.

Color roan (see page 113). Bred by and the property of Mr. George Tate, "Oakdale," Kangaroo Valley. Sire Rusty, bred by G. Tate, "Oakdale"; dam Cherry, by Heather of Bolaro (No. 27 in M.S. Herd Book of N.S.W. Rusty, by Favourite (imp.) from Lady Lucy.

Cow, Tory of Oakdale.

Color, light roan (see page 113). Bred by and the property of George Tate, Oakdale, Kangaroo Valley. Sire Young Heather, bred by George Tate; dam Victoria (bred by P. O'Sullivan), by Victor,

APPENDIX.

Young Heather by Heather (bred by R. W. Moses, Burrawang) from Charlotte, by Prodigal II. (bred by late G. Tate). Tory won first prize in test competition, Kangaroo Valley, 1909. Morning's milk, 30½lb., testing 4.6; night's, 19½lb., test 5.6. Third as Shorthorn cow in milk, Kiama Show, 1909, and first in Shorthorn group same show.

Bull, Jamie of Oakbank.

Color, brown and white (see page 118). Bred by McNab Bros., Oakbank, Victoria, and the property of the late Sir John Hay, Coolangatta, N.S.W. Sire Glen Elgin's Bruce (129), dam Jeanetta of Oakbank (472), by Gordon (38), grand-dam Jean (168), by Boy. Champion Jamie of Oakbank (184 A.H.B. of A.) was awarded first and champion at the Royal Shows, Melbourne, 1898, 1899, 1900, 1901, and 1902. At the Royal Shows, Sydney, 1899, 1901, 1903, 1904, 1905, and 1906 he was also awarded first and champion as Ayrshire bull. He held an unbeaten record, not only in the show-ring, but as a sire. He won numerous prizes at the country shows of Victoria and New South Wales as an Ayrshire bull, and has never been beaten as a dairy bull, competing against all dairy breeds. After his exit from Victoria the champion Ayrshire bulls at the Royal Shows Melbourne, in 1903, 1904, 1905, and 1906 were his progeny, being a different animal each year. The champion Ayrshire female at the Royal Show, Sydney, 1905, the reserve champion females in 1903 and 1907 at the same show, and the reserve champion female at the late Royal Show, Melbourne, were sired by him. The champion Ayrshire bull and cow of Queensland at the present time are the progeny of the famous "Jamie of Oakbank." His prize-winning progeny are too numerous to mention, having won honors at the principal shows in each of the States.

Jenny of Oakbank (1046).

Color, brown and white. Sire Rarity's Bull of Oakbank (355), by Glen Elgin's Bruce (129), dam Jenny II. of Barcheskie (177) (imp.), by Blairguhan (362 A.H.B. of S.). Jenny of Oakbank was awarded first prize as a yearling at the Royal Show, Melbourne, 1901, in a class of twenty. At Kiama she was first as Ayrshire cow, dry, and champion as best Ayrshire female.

Atlanta's "Prince of Meroo."

Color, brown and white (see page 119). Bred by and the property of Charles Lamond, Meroo. Calved February 25, 1905. Sire Prince Emerald (imp.), dam Atlanta of Oakbank, by Jenny's Jamie of Oakbank, by Jamie of Oakbank (184), grand-dam Brown Angelina of Oakbank, by Jamie of Oakbank (184), g.g. dam Angelina of Oakbank (410), by Pride of Berwick (72), g.g.g. dam Adelina of Oakbank (27), by Gordon (38), g.g.g.g. dam Annie Laurie (7), by Rival of Drumlanrig (78), g.g.g.g.g. dam Dinah, by Dunlop (25), sixth dam, Katie 2nd, by Rob Roy (79). Prizes won:—First and champion, Kangaroo Valley, 1906; first and champion, Kangaroo Valley, 1907; first and champion, Nowra, 1908; first as one in a group of dairy cattle, and breed, 1908; first and champion, Kiama, 1909; second as one of a group of dairy cattle, any breed; first, Nowra, as one of a group of six dairy cattle, 1909.

Aid of Oakbank.

Calved 18th September, 1909 (Vol IV.). Color, brown and white (see page 119). Bred by McNab Bros., of Oakbank, Victoria, and the property of Mr. Charles Lamond, Meroo, Shoalhaven, N.S.W. Sire Jamie of Oakbank (184), by Glen Elgin's Bruce (129), dam Amy of Oakbank (588), by Victor of Mertoun (91), grand-dam Alice Barcheskie (imp.), by Doctor (1646, A.H.B. of S., g.g. dam Rose 1st, by Brownhill, g.g.g. dam Rose, by Gultreehill, g.g.g.g. dam Leezie. Prizes won:—First and champion, Berry National Show, 1908; first

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

and champion, Kiama Show, 1909; first, Nowra, as Ayrshire cow in milk, 1909; first as one in the group of dairy cattle, 1909; first as one of a group of six dairy cattle, Nowra, 1908; second as one of a group of six dairy cattle, Kiama, 1908.

Champion Group of Ayrshire Cattle

At the Royal Show, Sydney, 1904. (See page 32.)

Champion Jamie of Oakbank (184), by Glen Elgin's Bruce (129), ex Jeanetta of Oakbank (472).

Alice of Oakbank (406), by Gordon (38), ex Annie Laurie of Oakbank (8). Four times champion Ayrshire cow at the Royal Show, Melbourne, and champion Ayrshire cow at the Royal Show, Sydney, 1904, when nearly 14 years old.

Maggie Lauder of Oakbank (723), by Glen Elgin's Bruce (129), ex Alice of Oakbank (406). Champion Ayrshire cow at the Royal Shows, Melbourne, 1901 and 1902, and reserve champion female at the Royal Show, Sydney, 1904, being beaten by her dam for the championship.

Rosella of Oakbank (1263), by Prefix of Oakbank (354), ex Rosamond III. of Oakbank, by Glen Elgin's Bruce (129).

Realm of Oakbank (1240), by Jamie of Oakbank (184) ex Rosamond III. of Oakbank, by Glen Elgin's Bruce (129).

Gleeful of Oakbank (1021), by Jamie of Oakbank (184), ex Grace of Oakbank (676).

Pledge III. of Oakbank (1198), by Achilles of Oakbank (235), by Jamie of Oakbank (184), ex Pledge II. of Oakbank (1197).

Purity of Coolangatta (1231), by Jamie of Oakbank (184) ex Peeress of Oakbank (757).

Ayrshire Cow, Whinflower of Oakbank.

Color, brown and white (see page 125). Bred by and the property of the late Sir John Hay, of Coolangatta, Shoalhaven, N.S.W.

Sire Jamie of Oakbank (184), dam Yellow Bess (819). Prizes won:—First and reserve champion, Royal Agricultural Show, Sydney, 1903; 1904, first as dry cow R.A.S., Sydney; first and champion, Royal Agricultural Show, Sydney, 1909. Afterwards sold by auction to Mr. M. J. Hindmarsh, Gerringong, N.S.W., for 66 guineas, at the late Sir John Hay's sale on 22nd April, 1909.

Ayrshire Cow, Sophia IV. of Coolangatta.

Color, brown and white. Bred by and the property of the late Sir John Hay, of Coolangatta, Shoalhaven, N.S.W. Sire Jamie of Oakbank (184), dam Sophia 3rd of Coolangatta, sire Rob Roy (149), dam Sophia 2nd. First prize, Royal Agricultural Show, Sydney, as a three-year-old, 1909.

Modesty.

Color, red with white spots (see page 141). The following pedigree is signed by Mr. Hugh Dudgeon, Jamberoo, the owner:—Sire Laddie, dam Flower 3rd, sire Valley Lad, grand-dam Flower 2nd, grand-sire Major 3rd, g.g. dam Flower, g.g. sire Calvert. The sire of Modesty, Laddie, in 1908, at Albion Park, won first as Durham cow in milk, also many other prizes.

Daisy.

Color, red (see page 141). The following particulars are supplied by the owner, Mr. Hugh Dudgeon.—Sire Earl of Gardingbrook, dam Maggie, sire Jimmy. Daisy won several prizes, second as dairy cow at Albion Park and Kiama Show in 1909.

Lucky of Oakdale.

Color, red and white (see page 149). Bred by and the property of George Tate, Oakdale, Kangaroo Valley. Sire Major V., dam Charlotte, red cow bred by John Thompson, by Prodigal II., bred by late George Tate, Broughton Village. Lucky won first prize for

APPENDIX.

dairy cow in milk, and champion prize, Robertson Show, 1898; first, dairy cow in milk, Berry, 1899; first test prize, Kangaroo Valley, 1900, morning's milk 34½lb., test 3.7, night's, 31½lb., test 4.2; first and champion prize, dairy cow, Moss Vale, 1900; first prize dairy cow in milk Berry, 1901; first prize, dairy cow, and first test cow, Kangaroo Valley Show, 1901, test, morning's milk 31lb., testing 4.4, night's 24lb., testing 5.2; first prize dairy cow, champion cow, and first in milking contest, Moss Vale, 1901; first prize, dairy cow, Berry, 1903; first prize, dairy cow, and second in test, Kangaroo Valley Show 1903; first prize, dairy cow in milk, Berry, 1904; first and champion prize dairy cow, and first in test, Kangaroo Valley, 1904, morning's milk 32½lb., testing 4, night's, 29lb., testing 5.

Cow, Perfection.

Color, red with white flanks (see page 149). Bred by Mr. Robert Booth, Woodstock, Jamberoo, N.S.W., and the property of Mr. Moses King, Curramore, Jamberoo, N.S.W. Sire, a bull bred by Mr. Connolly of Terragong, Shellharbour, N.S.W.; dam, a cow of superior quality owned by Mr. Robert Booth. Beyond this statement nothing is definitely known. She may therefore be termed, in common with hundreds of her type, an Illawarra bred cow. A modern Illawarra bred dairy cow or bull contains a considerable percentage of Ayrshire blood mingled with the Shorthorn.

Bull, Belmore.

Color, dark red (see page 157). Bred by Mr. William Moles, Tongarra, Albion Park, and the property of Messrs. Musgrave Bos., Yallah N.S.W. Calved at Tongarra in 1898. Sire Orion, dam Eureka. Sire Orion bred by Mr. Hugh Dudgeon, by Charmer out of Pet. Charmer was a well-known prize-taker at Illawarra Shows, including champion at a Kiama Show. He was out of the great producing cow Charmer, who produced under the old pan system 18½lb. of butter per week. Pet was by a son of Major, and was a prize-taker, also winner of milk prize at Albion Park Show, 1889, giving 34lb. at the morning's milking. In 1891 she was tested for Kiama Herd Book, yielding in twenty-four hours 57½lb. milk, at the rate of 15½lb. butter per week. Dam Eureka, by Mars (a prize-taker at Wollongong and Dapto Shows) out of Blossom. Eureka was one in a prize-winning pen at a Wollongong Show. Blossom was by Roan out of Beanblossom. Roan was full brother to the late James McGill's well-known prize-taker Modesty. Beanblossom, by Blucher out of Phoebe. Blucher was winner of many prizes, and bred by late Andrew McGill, and descended from Durham stock imported by Mr. John Terry-Hughes. The above particulars are signed by Mr. Andrew Moles.

Cow, Fairy.

Color, roan and white (see page 157). Calved 1899. Bred by Musgrave Bros., of Yallah, N.S.W., and the property of Mr. J. W. Musgrave. Sire Commodore, whose sire, Sovereign, was bred by Robert Miller, Gerringong; he was by a bull of the Major breed from Roanzi, a McGill cow. Dam Jemima, by a grandson of old Major (imp.) out of a Shorthorn cow. These particulars are furnished by Mr. J. W. Musgrave.

Bull, Pirate King.

Color, light roan (see page 163). The property of Mr. Alex. Campbell. Sire Pansy King, who was out of Pansy 4th (imp.), by Lord Sandgrave's (imp.), Pansy 4th by Umpire from Pansy 2nd. In 1903 Pansy 4th gave six gallons of milk per day, grass-fed. Dam, a cow that was once a noted milker, said to be descended from the once-famous Glenlee strain. Prizes won by Pirate King:—September 8, 1904: First and champion, Burrowa P. and A. Association. January 9, 1906: Dapto, first milking Shorthorn and champion for best bull

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

on the ground. January 17 : Albion Park, first and champion. January 26 and 27 : Kiama, second in milking Shorthorn. January 31 : Berry, first milking Shorthorn. February 8 : Wollongong, first prize milking Shorthorn and champion. February 14 : Nowra, first milking Shorthorn. 1909. Albion Park, first milking Shorthorn ; Kiama, second milking Shorthorn.

Bull, Guss of Coolangatta.

Color, brown and white (see page 163). The property of Mr. Thomas Brown, Holly Mount, Kiama, N.S.W. Sire, Prince Emerald (imp.) (4248, A.H.B. of Scotland). Calved March, 1898, bred by Thomas Scot, of Uetherhall, Sandilands. Sire Prince Imperial (3830, A.H.B. of Scotland). Dam Graceful of Oakbank (677), color brown and white. Calved August 8th, 1896. Sire Glen Elgin's Bruce (129).

Cow, Dumplin II.

Color, light red and white (see page 169). Eight years old. Bred by and the property of Mr. George Grey Longbrush, Kiama. By Ranji out of Dumplin I. Ranji by Beaconsfield out of Beauty, a handsome dairy cow. Beaconsfield was the "Earl of Beaconsfield." Dumplin I. was by Claude from Betsy. Claude was bred by the late John Lindsay, of Dapto, and was by the imported Ayrshire bull Teviott.

Cow, Butterfly.

Color, bright red and white (see page 169). Eight years old. Bred by and the property of Mr. George Grey, Kiama. By Ranji out of Pansy I. Ranji by Beaconsfield out of Beauty, a very handsome dairy cow. Beaconsfield by the Earl of Beaconsfield. Pansy II. by Rupert out of Pansy I. Rupert was bred by W. Graham, Jamberoo. Pansy I. was by Beaconsfield, by the Earl of Beaconsfield.

Cow, Gentle.

Color, roan and white, 2 years old (see page 179). Sire Emperor, dam Myrtle, Ayrshire-Shorthorn cross. One of second prize pen Kiama Show, 1909. Best pen heifers 2 years and under 3.

Cow, Favourite.

Color, roan and white, 3 years old (see page 179). Sire Emperor, dam Myrtle, Ayrshire-Shorthorn cross. First prize Kiama Show, 1908, milking heifer ; first prize Kiama Show, 1909, best six-tooth cow ; one of second prize pen, Kiama Show, 1909, best pen six-tooth cows.

Cow, Butterfly.

Color, roan and white, 3 years old (see page 179). Bred by and the property of Mr. E. J. Marks, Terragong, Jamberoo, N.S.W. Sire Emperor, dam Buttercup, Ayrshire Shorthorn cross. Second prize, Kiama Show, 1909, best six-tooth cow ; one of second prize pen, Kiama Show, 1908, best pen six-tooth cows.

Friesian Bull, Edinglassie (imp.).

Color black and white (see page 185). The property of Mr. Alexander Lamond, Berellan, Shoalhaven, N.S.W. Mr. Lamond supplies the following particulars :—"He has an unbeaten record in the Shoalhaven show-ring ; he has won as grand champion against all breeds for two years in succession for bull and progeny, against all dairy breeds at the show in 1908-1909, as well as five times champion Friesian bull in succession at same show. Edinglassie won first and champion in his class at the Royal Agricultural Show, Sydney, 1909."

Ayrshire-Friesian Cow, Beautie.

Color, black and white (see page 185). Bred by and the property of Mr. Lamond, who states :—"She has been a great prize-taker, taking four first and two champions at the Royal Show in succes-

APPENDIX.

sion, besides many firsts at the Coast Shows for dairy cow; her milk yield was 67½lb. of milk per day for seven days in succession. She is a grade Friesian and Ayrshire cross. Beautie was placed first and champion as dairy cow at the Royal Agricultural Shows, Sydney, of 1901 and 1902."

Blossom.

Color, roan and white (see page 205). Bred by and the property of Mr. E. J. Marks, Terragong, Jamberoo. Six years old. Sire Angeline Terragong, dam Illawarra c.w. One of first prize pen, Kiama Show, 1909, best pen of dry cows, any age or breed.

Barney II. of Alyne Bank.

Color, dark roan and white (see page 220). Sire Barney I., dam an Illawarra-bred cow. Bred by Mr. James Sharpe, Gerringong, and the property of Mr. John Love, Kiama. The pedigree of Barney I. is unknown beyond the fact that his dam was purchased whilst carrying him at St. Mary's saleyards. She was a deep-red cow of very superior quality. Barney I. was reared by Mr Barney McGucken, and purchased as a yearling by the late Mr. Thomas Hindmarsh, of Gerringong, who disposed of him to Mr. James Sharpe, Gerringong.

Barney II. of Nethervale.

Color, dark roan and white (see page 220). Bred by Mr. James Sharpe, Gerringong, and the property of Mr. John Love, Nethervale, Kiama. Barney II. of Nethervale is bred on practically the same lines as Barney II. of Alyne Bank. Sire Barney I. dam an Illawarra-bred cow of excellent dairy quality. Both these bulls have been successful sires.

Cows, Snaily and Model.

Snaily; color, red and white. Model; color, spotted roan and white. (See page 221.) Bred by and the property of Mr. James Miller, Alyne Bank, Gerringong. Both these cows are by Barney II. of Alyne Bank out of ordinary Illawarra-bred cows. These two cows won first and second prizes for best dairy cow, dry, at the Kiama Show, 1909.

Tot of Oakdale.

Tot of Oakdale (No. 742, M.S. Herd Book of N.S.W.). Color, red and white (see page 239). Bred by and the property of Mr. George Tate, Oakdale, Kangaroo Valley, N.S.W. Won first prize as a two-year-old heifer in milk, and champion prize for dairy cow, any age, at Berry Show, 1904. First prize, heifer in milk, and third in test prize, Kangaroo Valley Show, 1904, producing—morning's milk 23lb., testing 5.6, night's milk 22lb., testing 5.9. First prize, Royal Sydney Show, 1904; first prize, three-year-old cow, Kangaroo Valley Show, 1905; first prize, Shorthorn cow, 3 years old, Royal Sydney Show, 1905; second prize test cow, Kangaroo Valley, 1906, producing—morning's milk 28lb., testing 4.8, night's milk 21½lb., test 4.9; champion test prize, Kangaroo Valley Show, 1907—morning's milk 34lb., testing 4.4, night's milk 24lb., testing 5.0; also won six months' test held by Kangaroo Valley Show, 1906 and 1907, averaging 15½lb. butter per week. Tot won the test at last Kangaroo Valley Show (1909)—morning's milk, 33½lb., test 4.0; night's milk, 32½lb., test 4.2.

Princess, Kate, and Favourite.

Princess; color, light roan and white (see page 247). Bred by and the property of Messrs. James Bros., Rose Valley, Gerringong. By Emily's Prince, dam Josephine. Emily's Prince by Balko bull (A.A. Co.), dam Emily, Emily by Beaumont (A.A. Co.), dam by Major. Josephine by Alice's Robin, dam Napoleon cow. Alice's Robin by Robin Hood, dam Alice 1st. Alice 1st by Scotch Jock, dam Alice, from Old Nanny.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

Kate; color, spotted red and white. By Creemple's Son, dam Katie, Katie by Defiance, dam Spot. Creemple's Son by Alice's Prince, dam Creemple, Creemple by Robin Hood, dam Old Creemony, Defiance by Scotch Jock (McGill), dam Mary Queen of Scots (McGill).

Favourite; color, roan. By Daisy bull, dam Jenny, Jenny by Robin Hood, dam by Scotch Jock. Daisy bull by Young Major, dam Daisy, Daisy by Selon (A.A. Co.), dam by Old Major.

In competition for three special prizes amounting to £12 for cows of any breed, to be tested for three consecutive days, comprising six milkings of 12 hours' duration, from 20th to 26th January, 1896, in the Kiama district, open to all comers, provided the cows to be tested were placed in same paddock and fed on same class of food, Messrs. James Bros.' three cows—Favourite, Kate, and Princess—won first, second, and third prizes, with the following tests, cows grazing on grass paddock without hand-feeding.—

Name of Cow.	Total Amount of Milk. lbs.	Butter Fat Test.	Remarks.
Favourite ..	324.1	3.44	The cows tested were in good condition. The grass on which they grazed was good, being a mixture of English grasses.
Kate ..	300.1	3.35	
Princess ..	264.7	3.43	

At same show, for cow giving the largest quantity of butter from one milking, Messrs. James Bros.' Kate was first, Princess second. Mr. Hugh Dudgeon's two cows were placed third and fourth. Apart from show tests, Favourite has always been considered one of Illawarra's best dairy cows, as her prize list will attest.

Sunny Vale.

(See page 253.) Calved 16th October, 1903. Sire Bonnie, dam Fuchsia, by Bonnie; grand-dam Violet (red cow). Bonnie was bred by A. F. Warden, who supplies the following particulars:—Strain of the Conqueror breed, his blood running down to a heifer purchased by my late father from Messrs. Hanning, Griffith & Co., Richmond River. The heifer's name was Promise, a splendid type of Shorthorn. The g.g. dam was a cow owned by the late Joseph Petty, and she was one of the first class of cattle bred in this district by a Shorthorn bull. Sunny Vale has won champion prizes both in Sydney and Milton, and produced good stock. Conqueror produced good Shorthorn stock.

Queen.

Sire Ayrshire bull bred by H. Frederick, dam Ettie, Illawarra cow. Macleay strain. One of the second prize pen, Kiama Show, 1908, best pen dry cows, any age or breed.

Model.

Seven years. Sire Ayrshire Terragon ♂ dam Gem, Illawarra cow. One of first prize pen, Kiama Show, 1909, best pen dry cows, any age or breed.

Dairy Cow, Alice.

(See page 253.) Bred by and the property of Messrs. James Bros., Rose Valley, Gerringong, N.S.W. This animal is descended from stock kept by the late William James, of Shoalhaven, who was to his dying day an admirer of Scotch Jock and Major strains blended in a judicious manner with the best type of district-bred cattle.

INDEX.

- A.A. Company, 30, 31.
Abattoirs, Sydney, 29.
Abortion, Causes and Treatment of, 270.
Absurdities, 216.
Acre to a Cow, An, 235.
Acreage per Cow per Year, 62.
Agricultural Society, established, 29.
 Dapto, 84.
 Illawarra, 83.
 Kiama, 84.
Agricultural Societies, The Part Played By, 77.
Analysis of Butter, 260.
 Cream, 259.
 Food, 238.
Ancients, Wisdom of the, 103, 140.
Arloing on Blackleg, 274.
Atavism, 208.
Auction Company, Australian, 43.
 to 47.
 Hunter River, 47.
Australian Stock Importation Company, 30.
Ayrshire Association of Scotland, 124.
 Types Imported, 64.
 How to Judge the 124.
 Theories of the Origin of the, 20.
Axe on Abortion, Professor, 270.
Babcock Milk Tester, 260.
Bacon Curing, 296.
Bakewell, of Dishley, Improvements by, 20, 110, 211, 218, 219.
Ballies, 57.
Bang on Tuberculosis, Professor, 265.
 How it is Contracted, 266.
Barnes on Bacon Curing, Mr. Charles, 297.
Bates, Work of 20.
Beef, Breeding for, 58.
 Craze, Shorthorn, 88, 222.
Berry Estate Show, 86.
Bichat's Definition of Life, 18.
Billy Broughton, Aboriginal, 60.
Binks, Mr. Thomas, an Authority on Cheese Making, 290.
Blackleg Treatment of, 274.
Blaxland The Brothers, 21.
Bodalla Estate, 81.
Boiling Down, Wasteful, 47, 187.
Breeding, Consanguineous 265.
 Heavy Milkers Not Best for, 230.
 In and In, 202.
 Laws of, 201.
 "Like Begets Like" in, 226.
 Old Illawarra System of, 222.
 Practical Man in, 230.
 Problems of, 203.
 For Beginners, 227.
 Scepticism as to Records of, 230.
 A Science or Not, 233.
Breed? What is a, 246.
Breeds, Battle of the, 224.
 New, 204.
 In N.S.W., Variety of, 97.
Breeds—
 Ayrshire, 97; Pioneer Breeders of the, 173.
 Bengal, 21.
 Bos Longifrons, 93, 216.
 Boyd Cattle, 207.
 Brahmin, 49.
 Brittany, 155.
 Cape, 94.
 Durmams, 112, 203, 231, Favored in Illawarra, 53.
 Friesian in N.S.W., 151.
 Hansi or Hissar, 94.
 Hereford, Origin of, 158.
 Holderness, 111.
 Jersey, 217.
 Leicester, 208.
 Longhorns Origin of, 58, 218.
 Nellore, 94.
 Red Lincolns, 219; Influence of, 52.
 Norfolk, 228.
 Shorthorns, 222, 231.
 Are Affected by Inbreeding, How, 245.
 Teeswater, 111.
Breeder's—
 Combine Business with Ship Owning or Whale Fishing, 41.
 Of 1816, 26.
 Illawarra, 65.
 Some Early, 27, 31, 35, 52.
 South of Illawarra Lake, 215.
 Bakewell, Improvements By, 110, 211, 218.
 Bates, 114.
 Beatson, Duncan, 57.
 Ben Boyd, 47.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

- Berry, 47, 173; Rev. Henry, 108.
 Blaxland, 41.
 Booth, Thomas, 177, 212.
 Brown, John (Dapto), 56;
 William (Dapto), 56.
 Browns (Windsor), 43.
 Browne, William (Yallah), 56.
 Campbells, J. T., and others, 35.
 Collings, the brothers, 102, 112; In-and-in breeders, 176.
 Coman, William, 228.
 Coxes (Mudgee), 60.
 Dickson, John, 39.
 Evans, Evan, 54.
 Grey, Mr. George, 186.
 Hay, Sir John (not of Coolangatta), 83.
 Hobbler, Pioneer Devon Breeder, 161.
 Horsfall (England) on Rations, 237.
 Icely, Thomas, 43.
 Jenkins (Berkley), 213.
 Jennings, Sir Patrick, 83.
 Johnston Bros., 213.
 Lees, of Bathurst, 38, 60.
 Lomax, 46.
 Lowe (Mudgee), 60.
 McCaffrey, John, 214.
 McGill, His Stock Praised, 54; His Theory of Breeding, 174.
 McQueen (Segenhoe), 40.
 Marks, E. J., 232.
 Marr (Wollongong), 53.
 Quartly Family, The, 160.
 Quin, Peter, 72.
 Tate, George, 31, 213.
 Terry-Hughes, 56.
 Wastell, 110.
 Wilson, William, 96.
 Wylie, John, 173.
- Brewing in New South Wales, Early, 183.
- British Breeds, Origin of, 145.
- Brush, Dr., on Tuberculosis, 265.
- Bull Calf, The Rearing of a, 200.
- Bullock, The Ideal, 142.
- Bulls, Borrowing of, 98.
- Butter, Analysis of, 260.
 Beginnings of Trade in, 75.
 Factories, Waughope and Woodstock, 81.
 Producing Tests, 88, 209, 225.
 Of John McCaffrey's Cow, 214.
 Kill Interest in Performances, 224.
- Calf Rearing, 249; in Scotland, 121.
 Bull, Rearing of, 251.
- Calves, Diseases of Young, 250.
- Cameron, Prof., on Condiments, 237.
- Carter, Dr., on Tuberculosis, 264.
- Cattle, Boom in Beef, 1855-1865, 54.
 Character of, 32, 36, 43.
 Early Arrivals of, 21, 23.
 Breeders' Association Named, 107.
 Breeding, Problems of, 107.
 Number in N.S.W., 21, 24, 32, 60, 186, (in 1908) 316.
 Trade, The Overland, 39.
- Chabert on Abortion, 272.
- Cheddar Cheese Making, 291.
 Mr. Thomas Binks on, 290.
 Mr. John Mahon on, 291.
- Cheese Factory at Kiama, 78.
 Making, Practical Hints on, 289.
- Cleanliness in Milking, Importance of, 280.
- Coates on Hubback, 20; his Handbook, 116.
- Colors, 232; Why They Vary, 276.
- Commission Agency Business, Success of the, 197.
- Collins, Mr. Charles, 20.
- Colostrum, 251.
- Conformity to Type, Good or Bad, 192.
- Co-operation, An Early Attempt at, 196.
- Co-operative Butter Factory, Albion Park, 78.
 Company, South Coast and West Camden, 77, 196.
 Society, Coastal Farmers', 197.
- Cornevin on Blackleg, 274.
- Cows, Care of, 283.
- Cowpastures, 23.
- Cream Raisers, Practical Hints for, 287.
 Separators, 76.
 De Laval, 81, 259.
 Le Feldt-Lentsch, 76.
 Test Chart, 261.
- Tester, Babcock, 260.
 Simple Chemical Analysis of, 259.
- Cressy Company of Tasmania, 159.
- Crookshank on Change of Climate in Checking Disease, 265.
- Crosses, How to Breed, 208.
- Crossing, Boswell on, 246.
 For and Against, 202, 245.
- Cryback, 225, 231.
- Dairy Cow, The Points of a Good, 199.
 Type, Importance of, 201.

INDEX.

- Dairying as a Commercial Venture, 232.
 Increase of, by 1829, 32.
 Pioneer Days on the Lachlan, 165.
 Practical Hints on, 277.
 Rules, Fifty, 283.
 Statistics of Progress of, 1888-1907, 82, 194.
- Dam's Influence, 206, 225.
- Dams—
 Beach, 228.
 Blossoms, 209.
 Charmer, 245.
 Duchess, 115.
 Hecuba, 102.
 Honeycomb, 225.
 Mary Queen of Scots, 53.
 Tot of Oakdale, 229.
 Venus Victrix, 99.
 Whiteback, 225.
- Darwin on Selection, 276.
- De Laval Lactocrite, 259.
- Digestion, 168.
- Disease, Heredity in, 204.
- Diseases—
 Abortion, Prof. Axe on, 270.
 Chabert on, 272.
 Epizootic, 272.
 Nocard on, 273.
 Anthrax, 274.
 Blackleg, 274.
 Coast Cough, 68.
 "Drop," or Milk Fever, 252.
 Infection of Milk, 280.
 Lung Plague, 60.
 Milk Fever, Anderson, Treatment for, 255.
 McConnell Treatment for, 254.
 Manning on, 252.
 Schmidt Treatment for, 254.
 Youatt on, 252.
 Tuberculosis Appears, 68.
 Described, &c., 263.
 Heredity in, 265.
 Klein on, 263.
 Of Calves, 250.
 Serum Treatment of, 268.
 Schweinitz on, 267.
 Shumway on, 264.
 Woodhead on, 264.
- Dollar Spot, 97, 128, 225.
- Drought of 1867-1869, 193.
- Droughts, Some Memorable, 309.
- "Druid." The, quoted, 110.
- Dutch Requisites in a Cow, 148.
- Ensilage, see Silage.
- Escutcheon Theory, Guenon's, 256.
- Export Trade, 188.
- Factory System of Dairying, 80, 224.
 See also under Butter.
- Fancy Colors, Craze for, 211.
 in breeding, 217.
- Farms, Early Government, 27, 184.
- Fat, Result of Abundant Food, 308.
 Milk, How Produced, 243.
 Percentage, Reasons for Fluctuation, 243.
- Fatten, The Aptitude to, 203.
- Feed, Arranging, 238.
 Develops Milking Qualities, 201.
- Feeding, 235.
 By Hand, For and Against, 61, 235, 240.
 Grass, When to be Superseded, 240.
 Importance of, 277.
 Object of, 241.
 Table of Values of Substances, 242.
 Trials, 240.
- Financial Crisis, 31, 44.
- Flour Mills on South Coast, Early, 184.
- Fodder Conservation, 310.
- Food, What is Required in Cow, 241.
 Should it be Cooked, 244.
- Fresh Food and Ice Co., 78.
- Fruit Growing in Early Illawarra, 186.
- Gold in Australia, Discovery of, 190.
- Gold Fever, Its Excesses, 190.
- Governor Fitzroy as Patron, 49.
- Growth and Generation Related, 181.
- Guenon's Escutcheon Theory, 256.
- Hart, Captain, Fails in Business, 183.
- Hawkesbury College Pigs, 208.
- Hazard, Willis P., on the Jersey, 129.
- Heifer Calves, The Rearing of, 199.
 The Feeding of, 281.
 Stations of the Thirties, 36.
- Herds, see Studs.
 Origin of Our, 53.
- Herdbook, Kiama, 89.
- Heredity, 178, 202.
 And Disease, 200.
- Hog Raising 293.
- Hopping Joe's Meadow, 53.
- Horse of the Dairy Farm, The, 300.
 Breeding, H. D. Morton on, 302.
 Losses by, 303.
 What the Demand is, 303.
- "Hubback" described, 20.
- Hyam, David, on the Jersey, 129.
- Ice Making Scheme, a Failure, 76.

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

- Illawarra, Meaning of the Name, 48.
 Diggers Return to, 62.
 Grape Vine in, 186.
 Hardships of Pioneering in, 50.
 Jerseys No Success in, 70.
 New Blood Imported into, 198.
 System of Farming in, 61.
 Tobacco Growing in, 186.
 Work of Clearing, 184.
 Auctioneers and Dealers, 64.
 Breeders, Some Early, 31, 38, 52, 66, 183.
 Cattle, 38; How They Multiplied, 186; Origin of, 206, 219.
 Droughts, 309.
 Lake, Breeders South of, 214.
 Settlers, Character of, 28.
 Steam Packet Co., 43.
 Incidental Influences in Breeding, 170.
 Ireland, Cattle of, 18.
 Irish in Illawarra, The, 63, 69.
 Longhorns, 20.
 Jealousy of Breeders, 211.
 Judge, A Good, 105.
 How to, 227.
 Judgment, The Habit of, 226.
 Kent, Captain, 21.
 Killerly Herd Sold (in England), 99.
 Klein, Dr. E., on Tuberculosis, 263.
 Kuhn, Prof., on Feeding, 243.
 Lagore Remains (in Ireland), The, 153.
 Land Act of 1861, 75.
 Grabbing, 316.
 Grants, 21, 23, 27, 36.
 Holdings, Evil of Large, 36.
 Laws, Improvements in, 317.
 Sales 39, 40.
 Government Restriction of, 42.
 Landseer, the Painter, 122, 208.
 Laws of Breeding, 201.
 Lethargic Temperament, 203.
 "Like Begets Like," 226.
 Long, Prof., on the Jersey, 132.
 Low, Prof., on Irish Cattle, 154.
 On Buffalo Hump, 162.
 On Effect of Climate, 180.
 Lung Plague, 60.
 Macarthur, Captain John, 23, 31; His Longhorns, 57, 207, 212.
 Macquarie, Governor Lachlan, 24.
 McConnell, Prof. D. C., 159; on Milk Fever, 254.
 Madagascar Cattle, Early Idea of Importing, 23.
 Mahon on Cheese Making, Mr. John, 291.
 Manning on Milk Fever, 252.
 Manural Value of Stock, 235.
 Marchand's Milk Tester, 259.
 Marsden, Rev. Samuel, 23, 24.
 Marshall on Wild White Cattle, 138.
 Martin on the Channel Cattle, 133.
 Maternal Instinct in Cows, 192.
 Milk, Breeding for, 238, 281.
 Care of, 284.
 Is Affected by Food, How, 282.
 Company, Omega Concentrated, 81.
 Fever or "Drop," 252.
 Flow, Marsden on, 192.
 Formation in the Udder, 279.
 Mirror, 257.
 Producer, The Most Profitable, A Heavy, 281.
 Secretion, 168.
 Tester, Marchand's, 259.
 Soxhlet, 259.
 Utensils, 285.
 Milking, Rules for, 284.
 Model Farm, Governor King's, 24, 32.
 Monaro Discovered, 30.
 Mort, Thomas, on Refrigeration, 78.
 Morton, H. D., on Horse Breeding, 302.
 Nerve Force, 167.
 New South Wales in 1843, Condition of, 48.
 Number of Cattle in, 21, 24, 32, 60, 315, (in 1908) 316.
 Nocard on Abortion, 273.
 On Tuberculosis, 264, 267.
 Origins, 234.
 Overstocking, 193.
 Ox, Frennell on Origin of, 144.
 Pabst on Milk Mirrors, 257.
 Parkinson on the Jersey, 133.
 Pedigrees, Bogus, 230.
 Memory no Foundation for, 74.
 Why Absent, 54.
 Phillip, Governor, 21.
 Pig Industry, 80.
 Rearing, 293.
 Pigjawed Cattle Craze, 222.
 Pigs, Berkshire, 293, 299; Chester White, 294; Duroc Jersey, 294; Black Essex, Sussex, Poland China, Yorkshire, 295.
 Feeding of, 296.

INDEX.

- The Most Profitable Breed, 299.
- Points of a Good Dairy Cow, 199.
- Polwhele, Rev. Richard, on the Devon, 160.
- Quarterly, 160.
- Queensland, First Cattle in, 34.
- Racehorses, Breeding Analogy from, 211.
- Ration for a Dairy Cow, 237.
- Rules, Fifty Dairy, 283.
- Sale of Cattle, A, 26, 38, 39, 40, 43, 44.
- Schweinitz on Tuberculosis 267.
- Selection, a Legitimate Method, 276.
- Darwin on, 276.
- Of Dairy Animals, 201.
- Of Farms and Runs, 189.
- Separator, Home, 260.
- See also "Cream."
- Shorthorn, Theories of Origin, 20.
- Show, First Cattle, 24.
- Ulladulla, 86.
- Shumway on Tuberculosis, 264.
- Silage, Cautions Regarding, 312.
- Its Qualities, 310.
- Rate of Consumption of, 311.
- Stack, How to Build a, 313.
- Substances Suitable for, 313.
- Sweet or Sour, 311.
- Silo, 309.
- Similarity, a Law of Breeding, 201.
- Sires, Influence of, 225.
- Loaning of, Affects Pedigreeing, 72.
- Sires—
- Admiral Roundrib, 146.
- Alexander, 67.
- Baronet, 71.
- Belmore, 231.
- Bloxedge, 58.
- Boxer, 72, 207.
- Boxsell, 229.
- Butterfly, 67.
- Comet, 139, 171.
- Cox's roan bull, 67.
- Duke (several so named), 71.
- Earl Beaconsfield, 198.
- Ella, 139.
- Erasmus, 139.
- Favorite, 246.
- "Governors," The, 207.
- Hubback, 20, 108, 115.
- Major, 57, 72, 171.
- Cattle, 197, 225.
- Mariner, 67.
- Musket, 72.
- Napoleon, 229.
- Noble Arthur, 70.
- Nonsuch, 52.
- Petrarch, 39.
- Prodigal, 229.
- Royal Butterfly, 57.
- Sir John, 70.
- Sojer Boy, 207.
- Theodore, 171.
- "Theodores," The, 208.
- Tricolor, 70.
- Soil, Constituents of the, 236, 306.
- Illawarra in 1856-1866, Its Fertility, 305.
- Soiling System, 61.
- Soxhlet Milk Testing, 259.
- Spain, Cattle of, 18, 20.
- Stalls, Care of, 283.
- Stewart, Prof., on Cow Food, 237.
- Stock in Colony, Number of, 21, 24, 32, 60, 315, (1908) 316.
- Manural Value of, 235.
- In Illawarra, Breeding of Stud, 67.
- Fund of 1823, Subscribers to the, 29.
- Tax, 42.
- Stockman, the Early (described), 187.
- Storer on Wild White Cattle, 137.
- Quoted, 144; On In-and-in Breeding, 176.
- Studs—
- Coolangatta, 32, 47.
- Coombing Park, Carcoar, 47.
- Croome, 56.
- Exeter Farm (three contemporary), 49.
- Jellat Jellat, 53.
- Lomax, 46.
- Tomki Estate, 44.
- Sturtevant on the Ayrshire, 117, 122.
- On the Jersey, 133.
- Sussex-street Agents, 75; Their Bad Influence, 196.
- Testing as Butter Producers, Some Examples of, 209.
- Rules for, 262.
- Thomas on Blackleg, 274.
- Townsend, Joseph, on Coolangatta, 47.
- Twofold Bay, 47.
- Uniformity as a Guide, 232.
- Utensils, Care of, 235.
- Vagaries of Breeding, 208.
- Value of Cattle in Early Days, 21, 23, 24, 26, 30, 32, 40, 46, 67, in eighties 194.
- Virgil on Cattle 140.
- Wallace Defines a Species, 162.
- On Heredity, 180.
- Watkins on Debt to Romans, 143, 146.
- Watson, a local authority, on

FIRST CENTURY OF DAIRYING IN NEW SOUTH WALES.

- | | |
|---|--|
| Weismann on Heredity, 180.
Bacon Curing, 296. | Wollongong, 43. |
| Whitcher, Prof., on Feeding, 243. | Woodhead on Tuberculosis, 264. |
| White, a Color Wrongly Des-
pised for Shorthorns, 138. | Yeld on the Hereford, 159. |
| "Wild Cattle," The, 21, 96.
White Cattle, 276. | Youatt on Longhorns, 58; on
the Shorthorn, 108; on the
Hereford, 158; on Milk
Fever, 252. |
| Wilson on Breeds, 104. | Young, Arthur, on Origins, 158. |
| Wing, Prof., on Feeding, 243. | |

ERRATA.

- Page 38, line 35, for "Minnmurra" read "Minnamurra." Line 59,
for "pear" read "year."
Page 46, line 50, for "Keelogue" read "Keelogue."
Page 54, line 30, for "and" read "to."
Page 55, for "Haurahan" read "Hanrahan."
Page 59, for "Lindsley" read "Lindsay."
Page 63, for "Aryshire" read "Ayrshire"
Page 110, line 34, for "Hubbuck" read "Hubback."
Page 119, for "Allanta's" read "Atlanta's."
Page 215, transpose lines 18 and 19.

Index to Advertisements,

W. S. Friend & Co. (Melotte Cream Separators)	ii.
New South Wales Fresh Food and Ice Co., Ltd.	iii.
Dalgety & Co., Ltd. (Tangye's Engines)	iv.
Lassetter's (Dairy Requirements)	I
United Insurance Co., Ltd.	2
Tooth & Co., Ltd. ("Auld Jock" Whisky)	2
Mick Simmons ("Sunol" Tobacco)	3
Sutton Forest Meat Co.	4
Wm. Inglis & Son (Cattle Salesmen)	4
Chas. Barnes & Co., Ltd. (Bacon and Hams)	5
Samuel Cocks (Photographer, Kiama)	6
Stewart & Morton, Auctioneers, Nowra	6
Prescott, Ltd. (Taylor's Calf Foot)	v.
W. E. Bird (Cattle Medicines)	vi.
Lever Bros., Ltd. (Oil Cake)	vii.
C. A. Macdonald ("Hercules" Refrigerators)	278
Waugh & Josephson (Alfa-Laval Separators)	286
Coastal Farmers' Co-operative Society Ltd.	318
Greystanes Stud of Ayrshires	318
Alex. Campbell (Auctioneer), Gerringong	338
J. J. McCarthy (Auctioneer), Jamberoo	338

Alex. Campbell



**General Auctioneer
& Sworn Valuator
GERRINGONG.**

Sales conducted in the Kiama,
Shoalhaven and Wollongong
Districts.

Personal Attention, Highest Prices
and Prompt Returns.

ESTABLISHED 1883.

Over 40 Years' Practical Experience in Breeding, Selling,
and Selecting Dairy Cattle.

J. J. McCARTHY,



**AUCTIONEER AND
SWORN VALAUTOR**

Under Real Property Act.

~~~~~

Sales Conducted Throughout

Wollongong, Dapto, Albion Park,  
Shellharbour, Jamberoo, Kiama,  
Gerringong, Berry and Nowra.

~~~~~

Estimates Given all Descriptions Stock and Lands.

ADDRESS—

Wattle Grove, Jamberoo.

TAYLORS' CALF FOOD

WILL PUSH YOUR
CALVES AHEAD
LIKE ONE
O'CLOCK



Be sure it's
"TAYLORS"

BEWARE OF CHEAP imitations
"TAYLORS" CALF FOOD like all other
successful articles has cheap substitutes
Sole Wholesale Agents,
PRESCOTT LTD 336-338 Sussex St. Sydney.

"Australian Fruit Preserving"

By GEO. ENGLAND HOOKE.

A
PRACTICAL
BOOK

Of 264 Pages, Highly Recommended and
Without Equal.

The Best Methods of Preserving Fruits
and Vegetables grown in Australia.

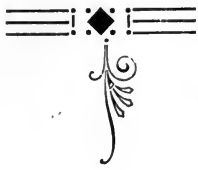
With Simple Instructions for Making Jams,
Jellies, Pickles, Sauces, &c.

It will be sent Post Free on Receipt of a
Postal Note for 2/6

The Sydney & Melbourne Publishing Co., Ltd.,

74a PITT STREET, SYDNEY.

Dairymen!



MAKE MORE MONEY

A
HEALTHY
HERD
MEANS
INCREASED
PROFITS

ADMINISTERED ONE DRENCH
—THE EFFECTS WERE
WONDERFUL.

Alstonville, Richmond River, 10 7 07.

Dear Sir,—We have been using the Manning Drench and Abortion Outfit and Tablets since their introduction into this District with splendid results. Only this month we had a valuable cow in a distressed state after calving, and after ADMINISTERING ONE DRENCH THE EFFECTS WERE WONDERFUL. She is now in a fine healthy condition and milking well. We can only put this recovery down to your wonderful medicine, as this particular case was put down to blood poisoning by different dairymen. We can also recommend your Outfit and Abortion Tablets, which are not in solution and therefore do not lose their chemical action as mixed solutions do.—Yours faithfully, MILLER BROS.

ONE GOOD COW IS WORTH
AT LEAST £8.

The Manning Drenches may be
obtained at all Stores.

THE MANNING DRENCH, 1/6 per packet.

The most extensively used Drench in the Commonwealth of Australia and the Dominion of New Zealand.

VETRINE CALVES' CORDIAL.—Price, 2/6 per bottle.

A most effective Remedy for Scours in Calves and Foals. A few doses will cure the severest case of Scours.

VETRINE OINTMENT.—For Sore Teats. Large Pot, 1/6.

For Soothing, Softening, and Healing the parts this Ointment cannot be surpassed.

CONTAGIOUS ABORTION IN COWS.

We supply a Complete Outfit to treat 100 Cows and Bulls for 15/. Full particulars with outfit.

Prepared by the

Manning Manufacturing Co.,
New Zealand.

Sole Agent:

W. E. Bird,
Wynyard Buildings, Carrington St.,
SYDNEY



3 1175 01561 8062

Milk Flow

The £ s. d. of it.

MR. ALFRED GORRIE, Secretary of Queensland Dairy Herd Book Society, writes:—

“Many years ago I recognised the value of Sunlight Oil Cake as a fodder for dairy stock in conjunction with other foods, and have been using Sunlight Oil Cake regularly for the past 11 or 12 years, and the prices ruling for fodder recently induced me to give a more careful trial of Sunlight Oil Cake in comparison with other cattle fodders. For one month previous to 10th January, ultimo, when the trial commenced, my cows were supplied with a feed ration of lucerne and green chaffed corn with 6lbs. of bran, the milk from each cow being weighed morning and evening, and a careful check kept on the cream results. On the date mentioned I substituted 3lbs. of Sunlight Oil Cake for the bran ration (6lbs.), and continued with the same quantities of lucerne and green corn; the increase of milk for the succeeding twenty one days averaged 2lbs. per cow per day, with no deterioration in the quality of the milk, 8½lbs. of milk being required to produce 1lb. of 40 test cream. The results I consider very much in favour of Sunlight Oil Cake as a food for milch cows; while the Sunlight Oil Cake costs less than bran by one shilling and one penny per cow per week, the increased quantity of milk for that period had a value of elevenpence per cow. Thus the saving in feeding eight cows on Sunlight Oil Cake instead of bran proved to be 16s. per week. I believe, further, that the net profits from each cow would have been increased had I fed 4 lbs. instead of 3lbs. of Sunlight Oil Cake, because since the conclusion of the test I have given a more liberal ration of Sunlight Oil Cake, and find a considerable increase in the milk yield from all cows, including some that were going dry.”

For Post Free Book—

“MILK FLOW AND BUTTER FAT increased by Scientific Feeding,”

By H. M. SOMER, Royal Agricultural Society,

Write to Lever Brothers Limited (Dairy Department) Sydney.



Guaranteed Pure.

See that the name “Sunlight” is
branded on every cake.

