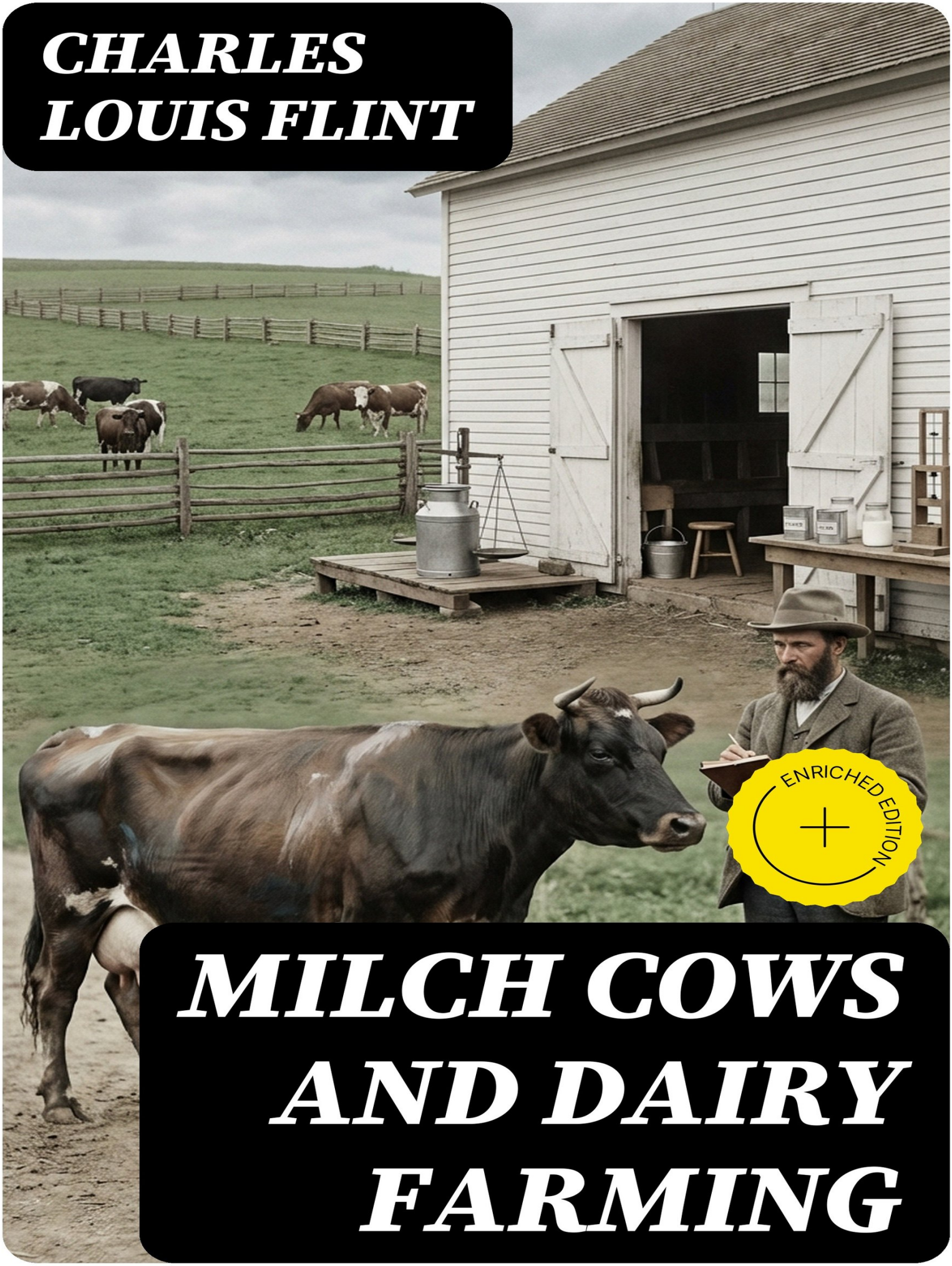
CHARLES LOUIS FLINT




# MILCH COWS AND DAIRY FARMING

**Charles Louis Flint**

# Milch Cows and Dairy Farming

**Enriched edition.**

*Introduction, Studies and Commentaries by Gavin Avery*

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# Milch Cows and Dairy Farming

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# PREFACE.

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This work is designed to embody the most recent information on the subject of dairy farming[1q]. My aim has been to make a practically useful book. With this view, I have treated of the several breeds of stock, the diseases to which they are subject, the established principles of breeding, the feeding and management of milch cows, the raising of calves intended for the dairy, and the culture of grasses and plants to be used as fodder.

For the chapter on the diseases of stock, I am largely indebted to Dr. C. M. Wood, Professor of the Theory and Practice of Veterinary Medicine, and to Dr. Geo. H. Dadd, Professor of Anatomy and Physiology, both of the Boston Veterinary Institute. If this chapter contributes anything to promote a more humane and judicious treatment of cattle when suffering from disease, I shall feel amply repaid for the labor bestowed upon the whole work.

The chapter on the Dutch dairy, which I have translated from the German, will be found to be of great practical value, as suggesting much that is applicable to our American dairies. This chapter has never before, to my knowledge, appeared in English.

The full and complete explanation of Guénon's method[1] of judging and selecting milch cows,—a method originally regarded as theoretical, but now generally admitted to be very useful in practice,—I have translated from the last edition of the treatise of M. Magne, a very sensible French writer, who has done good service to the

agricultural public by the clearness and simplicity with which he has freed that system from its complicated details.

The work will be found to contain an account of the most enlightened practice in this country, in the statements those actually engaged in dairy farming; the details of the dairy husbandry of Holland, where this branch of industry is made a specialty to greater extent, and is consequently carried to a higher degree of perfection, than in any other part of the world; and the most recent and productive modes of management in English dairy farming, embracing a large amount of practical and scientific information, not hitherto presented to the American public in an available form.

Nothing need be said of the usefulness of a treatise on the dairy. The number of milch cows in the country, forming so large a part of our material wealth, and serving as a basis for the future increase and improvement of every class of neat stock, on which the prosperity of our agriculture mainly depends; the intrinsic value of milk as an article of internal commerce, and as a most healthy and nutritious food; the vast quantity of it made into butter and cheese, and used in every family; the endless details of the management, feeding, and treatment, of dairy stock, and the care and attention requisite to obtain from this branch of farming the highest profit, all concur to make the want of such a treatise, adapted to our climate and circumstances, felt not only by practical farmers, but by a large class of consumers, who can appreciate every improvement which may be made in preparing the products of the dairy for their use.

The writer has had some years of practical experience in the care of a cheese and butter dairy, to which has been

added a wide range of observation in some of the best dairy districts of the country; and it is hoped that the work now submitted to the public will meet that degree of favor usually accorded to an earnest effort to do something to advance the cause of agriculture.

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DAIRY FARMING

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# CHAPTER I.
# INTRODUCTORY.—THE VARIOUS RACES OF PURE-BRED CATTLE IN THE UNITED STATES.

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The milking qualities of our domestic cows are, to some extent, artificial, the result of care and breeding. In the natural or wild state, the cow yields only enough to nourish her offspring for a few weeks, and then goes dry for several months, or during the greater part of the year. There is, therefore, a constant tendency to revert to that condition, which is prevented only by judicious treatment, designed to develop and increase the milking qualities so valuable to the human race. If this judicious treatment is continued through several generations of the same family or race of animals, the qualities which it is calculated to develop become more or less fixed, and capable of transmission. Instead of being exceptional, or peculiar to an individual, they become the permanent characteristics of a breed. Hence the origin of a great variety of breeds or races, the characteristics of each being due to local circumstances such as climate, soil, and the special objects of the breeder, which may be the production of milk, butter and cheese, or the raising of beef or working cattle.

A knowledge of the history of different breeds, and especially of the dairy breeds, is of manifest importance. Though very excellent milkers will sometimes be found in all of them, and of a great variety of forms, the most desirable

dairy qualities will generally be found to have become fixed and permanent characteristics of some to a greater extent than of others; but it does not follow that a race whose milking qualities have not been developed is of less value for other purposes, and for qualities which have been brought out with greater care. A brief sketch of the principal breeds of American cattle, as well as of the grades or the common stock of the country, will aid the farmer, perhaps, in making an intelligent selection with reference to the special object of pursuit, whether it be the dairy, the production of beef, or the raising of cattle for work.

In a subsequent chapter on the selections of milch cows, the standard of perfection will be discussed in detail, and the characteristics of each of the races will naturally be measured by that. In this connection, and as preliminary to the following sketches, it may be stated that, whatever breed may be selected, a full supply of food and proper shelter are absolutely essential to the maintenance of any milking stock, the food of which goes to supply not only the ordinary waste of the system common to all animals, but also the milk secretions, which are greater in some than in others. A large animal on a poor pasture has to travel much further to fill itself than a small one. A small or medium-sized cow would return more milk in proportion to the food consumed, under such circumstances, than a large one.

In selecting any breed, therefore, regard should be had to the circumstances of the farmer, and the object to be pursued. The cow most profitable for the milk-dairy may be very unprofitable in the butter and cheese dairy, as well as for the production of beef; while for either of the latter

objects the cow which gave the largest quantity of milk might prove very unprofitable. It is desirable to secure a union and harmony of all good qualities, so far as possible; and the farmer wants a cow that will milk well for some years, and then, when dry, fatten readily, and sell to the butcher for the highest price. These qualities, though often supposed to be incompatible, will be found to be united in some breeds to a greater extent than in others; while some peculiarities of form have been found, by observation, to be better adapted to the production of milk and beef than others. This will appear in the following pages.

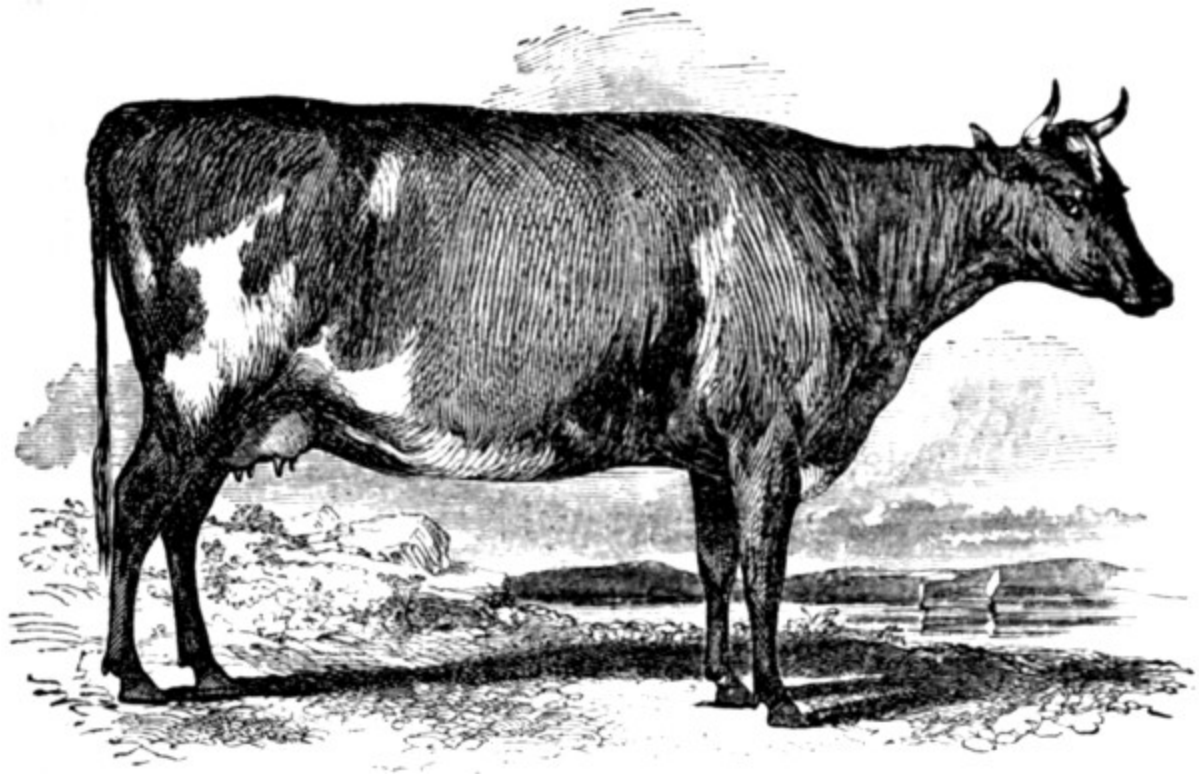

Fig. 1. Ayrshire Cow, imported and owned by Dr. Geo. B. Loring, Salem, Mass.

## The Ayrshires

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are justly celebrated throughout Great Britain and this country for their excellent dairy qualities. Though the most recent in their origin, they are pretty distinct from the other Scotch and English races. In color, the pure Ayrshires are generally red and white, spotted or mottled, not roan like many of the short-horns, but often presenting a bright contrast of colors. They are sometimes, though rarely, nearly or quite all red, and sometimes black and white; but the favorite color is red and white brightly contrasted, and by some, strawberry-color is preferred. The head is small, fine, and clean; the face long, and narrow at the muzzle, with a sprightly yet generally mild expression; eye small, smart, and lively; the horns short, fine, and slightly twisted upwards, set wide apart at the roots; the neck thin; body enlarging from fore to hind quarters; the back straight and narrow, but broad across the loin; joints rather loose and open; ribs rather flat; hind quarters rather thin; bone fine; tail long, fine and bushy at the end; hair generally thin and soft; udder light color and capacious, extending well forward under the belly; teats of the cow of medium size, generally set regularly and wide apart; milk-veins prominent and well developed. The carcass of the pure-bred Ayrshire is light, particularly the fore quarters, which is considered by good judges as an index of great milking qualities; but the pelvis is capacious and wide over the hips.

On the whole, the Ayrshire is good-looking, but wants some of the symmetry and aptitude to fatten which characterize the short-horn, which is supposed to have contributed to build up this valuable breed on the basis of the original stock of the county of Ayr; a county extending

along the eastern shore of the Frith of Clyde, in the south-western part of Scotland, and divided into three districts, known as Carrick, Cunningham, and Kyle: the first famous as the lordship of Robert Bruce, the last for the production of this, one of the most remarkable dairy breeds of cows in the world. The original stock of this county, which undoubtedly formed the basis of the present Ayrshire breed, are described by Aiton[2], in his *Treatise on the Dairy Breed of Cows*, as of a diminutive size, ill fed, ill shaped, and yielding but a scanty return in milk. They were mostly of a black color, with large stripes of white along the chine and ridge of their backs, about the flanks, and on their faces. Their horns were high and crooked, having deep ringlets at the root,—the plainest proof that the cattle were but scantily fed; the chine of their backs stood up high and narrow; their sides were lank, short, and thin; their hides thick, and adhering to their bones; their pile was coarse and open; and few of them yielded more than six or eight quarts of milk a day when in their best plight, or weighed when fat more than from twelve to sixteen or twenty stones avoirdupois, at eight pounds the stone, sinking offal.

“It was impossible,” he continues, “that these cattle, fed as they then were, could be of great weight, well shaped, or yield much milk. 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 almost every day, with a mash of weak corn and chaff daily for a few days after calving; and their pasture in summer was of the very worst quality, and eaten so bare that the cattle were half starved, and had the aspect of starvelings. A wonderful change has since

been made in the condition, aspect, and qualities, of the Ayrshire dairy stock. They are not now the meagre, unshapely animals they were about forty years ago; but have completely changed into something as different from what they were then as any two breeds in the island can be from each other. They are almost double the size, and yield about four times the quantity of milk that the Ayrshire cows then yielded. They were not of any specific breed, nor uniformity of shapes or color; neither was there any fixed standard by which they could be judged."

Aiton wrote in 1815, and even then the Ayrshire cattle had been completely changed from what they were in 1770, and had, to a considerable extent, at least, settled down into a breed with fixed characteristics, distinguished especially for an abundant flow and a rich quality of milk. A large part of the improvement then manifested was due to better feeding and care, but much, no doubt, to judicious crossing. Strange as it may seem, considering the modern origin of this breed, "all that is certainly known is that a century ago there was no such breed as Cunningham or Ayrshire in Scotland. Did the Ayrshire cattle arise entirely from a careful selection of the best native breed? If they did, it is a circumstance unparalleled in the history of agriculture. The native breed may be ameliorated by careful selection; its value may be incalculably increased; some good qualities, some of its best qualities, may be for the first time developed; but yet there will be some resemblance to the original stock, and the more we examine the animal the more clearly we can trace out the

characteristic points of the ancestor, although every one of them is improved.”

Aiton remembered well the time when some short-horn or Dutch cattle, as they were then called, were procured by some gentlemen in Scotland, and particularly by one John Dunlop, of Cunningham, who brought some Dutch cows—doubtless short-horns—to his byres soon after the year 1760. As they were then provided with the best of pasture, and the dairy was the chief object of the neighborhood, these cattle soon excited attention, and the small farmers began to raise up crosses from them. This was in Cunningham, one of the districts of Ayrshire, and Mr. Dunlop’s were, without doubt, among the first of the stranger breed that reached that region. About 1750, a little previous to the above date, the Earl of Marchmont bought of the Bishop of Durham several cows and a bull of the Teeswater**[3]** breed, all of a brown color spotted with white, and kept them some time at his seat in Berwickshire. His lordship had extensive estates in Kyle, another district of Ayrshire, and thither his factor, Bruce Campbell, took some of the Teeswater breed and kept them for some time, and their progeny spread over various parts of Ayrshire. A bull, after serving many cows of the estates already mentioned, was sold to a Mr. Hamilton, in another quarter of Ayrshire, and raised a numerous offspring.

About the year 1767, also, John Orr sent from Glasgow to his estate in Ayrshire some fine milch cows, of a much larger size than any then in that region. One of them cost six pounds, which was more than twice the price of the best cow in that quarter. These cows were well fed, and of course

yielded a large return of milk; and the farmers, for miles around, were eager to get their calves to raise.

About the same time, also, a few other noblemen and gentlemen, stimulated by example, bought cattle of the same appearance, in color brown spotted with white, all of them larger than the native cattle of the county, and when well fed yielding much larger quantities of milk, and their calves were all raised. Bulls of their breed and color were preferred to all others.

From the description given of these cattle, there is no doubt that they were the old Teeswater, or Dutch; the foundation, also, according to the best authorities, of the modern improved short-horns. With them and the crosses obtained from them the whole county gradually became stocked, and supplied the neighboring counties, by degrees, till at present the whole region, comprising the counties of Ayr, Renfrew, Lanark, Dumbarton, and Stirling, and more than a fourth part of the whole population of Scotland, a large proportion of which is engaged in manufactures and commercial or mechanical pursuits, furnishing a ready market for milk and butter, is almost exclusively stocked with Ayrshires.

The cross with larger cattle and the natives of Ayrshire produced, for many years, an ugly-looking beast, and the farmers were long in finding out that they had violated one of the plain principles of breeding in coupling a large and small breed so indiscriminately together, especially in the use of bulls proportionately larger than the cows to which they were put. They did not then understand that no crosses could be made in that way to increase the size of a race,

without a corresponding increase in the feed; and many very ill-shaped animals were the consequence of ignorance of a natural law. They made large bones, but they were never strong and vigorous in proportion to their size. Trying to keep large animals on poor pasture produced the same effect. The results of first crosses were therefore very unsatisfactory; but gradually better feeding and a reduction in size came to their aid, while in the course of years more enlightened views of farming led to higher cultivation, and consequently to higher and better care and attention to stock. The effect of crosses with the larger Teeswater or short-horn was not so disastrous in Ayrshire as in some of the mountain breeds, whose feed was far less, while their exposure on high and short pastures was greater.

The climate of Ayrshire is moist and mild, and the soil rich, clayey, and well adapted to pasturage, but difficult to till. The cattle are naturally hardy and active, and capable of enduring severe winters, and of easily regaining condition with the return of spring and good feed. The pasture-land of the county 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 1815. The local demand for fresh dairy products has very naturally taxed the skill and judgment of the farmers and dairy-men 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 pure-bred races. The owners of dairies in the county of Ayr and the neighborhood were generally small tenants, who took charge of their stock themselves, saving and breeding from the offspring of good milkers, and drying off and feeding such as were found to be unprofitable for milk, for the butcher; and thus the production of milk and butter has for many years been the leading object with the owners of this breed, and symmetry of form and perfection of points for any other object have been very much disregarded, or, if regarded at all, only from this one point of view—the production of the greatest quantity of rich milk.

The manner in which this result has been brought about may further be seen in a remark of Aiton, who says that the Ayrshire farmers prefer their dairy bulls according to the feminine aspect of their heads and necks, and wish them not round behind, but broad at the hook-bones and hips, and full in the flanks. This was more than forty years ago, and under such circumstances, and with such care in the selection of bulls and cows with reference to one specific object, it is not surprising that we find a breed now wholly unsurpassed when the quantity and quality of their produce is considered with reference to their proportional size and the food they consume. The Ayrshire cow has been known to produce over ten imperial gallons of good milk a day.

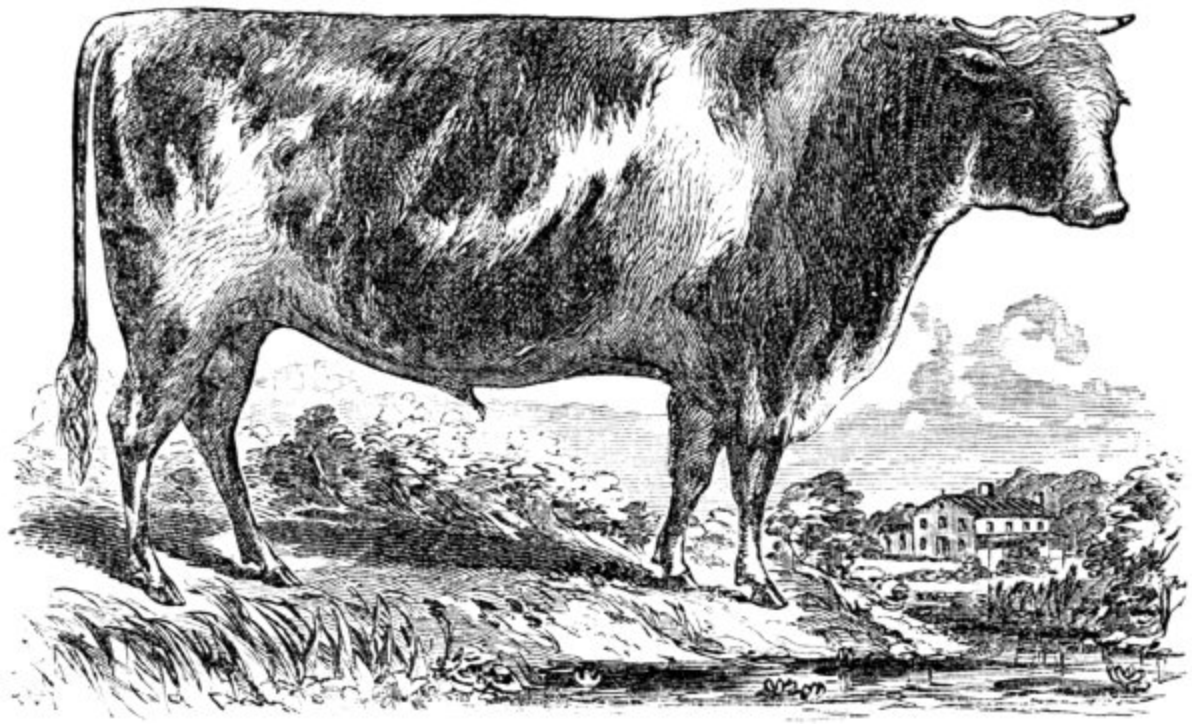

Fig. 2. Ayrshire Bull “ALBERT,”
Imported and owned by the Mass. Soc. for Promoting Agriculture.

A cow-feeder in Glasgow, selling fresh milk, is said to have realized two hundred and fifty dollars in seven months from one good cow; and it is stated, on high authority, that a dollar a day for six months of the year is no uncommon income from good cows under similar circumstances, and that seventy-five cents a day is below the average. But this implies high and judicious feeding, of course: the average yield, on ordinary feed, would be considerably less.

Youatt estimates the daily yield of an Ayrshire cow, for the first two or three months after calving, at five gallons a day, on an average; for the next three months, at three gallons; and for the next four months, at one gallon and a half. This would be 850 gallons as the annual average of a cow; but allowing for some unproductive cows, he estimates the average of a dairy at 600 gallons per annum for each

cow. Three gallons and a half of the Ayrshire cow's milk will yield one and a half pounds of butter. He therefore reckons 257 pounds of butter, or 514 pounds of cheese, at the rate of 24 pounds to 28 gallons of milk, as the yield of every cow, at a fair and perhaps rather low average, in an Ayrshire dairy, during the year. Aiton sets the yield much higher, saying that "thousands of the best Ayrshire dairy-cows, when in prime condition and well fed, produce 1000 gallons of milk per annum; that in general three and three quarters to four gallons of their milk will yield a pound and a half of butter; and that 27½ gallons of their milk will make 21 pounds of full-milk cheese." Mr. Rankin puts it lower—at about 650 to 700 gallons to each cow; on his own farm of inferior soil, his dairy produced an average of 550 gallons only.

One of the four cows originally imported into this country by John P. Cushing, Esq., of Massachusetts, gave in one year 3864 quarts, beer measure, or about 966 gallons, at ten pounds to the gallon, being an average of over ten and a half beer quarts a day for the whole year. It is asserted, on good authority, that the first Ayrshire cow imported by the Massachusetts Society for the Promotion of Agriculture, in 1837, yielded sixteen pounds of butter a week, for several weeks in succession, on grass feed only. These yields are not so large as those stated by Aiton; but it should, perhaps, be recollected that our climate is less favorable to the production of milk than that of England and Scotland, and that no cow imported after arriving at maturity could be expected to yield as much, under the same circumstances,

as one bred on the spot where the trial is made, and perfectly acclimated.

In a series of experiments on the Earl of Chesterfield's dairy farm, at Bradley Ball, interesting as giving positive data on which to form a judgment as to the yield, it was found that, in the height of the season, the Holderness cows gave 7 gallons 1 quart per diem; the long-horns and Alderneys, 4 gallons 3 quarts; the Devons, 4 gallons 1 quart; and that, when made into butter the above quantities gave, respectively, 38½ ounces, 28 ounces, and 25 ounces.

The Ayrshire, a cow far smaller than the Holderness, at 5 gallons of milk and 34 ounces of butter per day, gives a fair average as to yield of milk, and an enormous production of butter, giving within 4½ ounces as much from her 5 gallons as the Holderness from her 7 gallons 1 quart; her rate being nearly 7 ounces to the gallon, while that of the Holderness is considerably under 6 ounces.

The evidence of a large and practical dairyman is certainly of the highest value; and in this connection it may be stated that Mr. Harley, the author of the *Harleian Dairy System*, who established the celebrated Willowbank Dairy, in Glasgow, and who kept, at times, from two hundred and sixty to three hundred cows, always using the utmost care in selection, says that he had cows, by way of experiment, from different parts of the united kingdom. He purchased ten at one Edinburgh market, of the large short-horned breed, at twenty pounds each, but these did not give more milk, nor better in quality, than Ayrshire cows that were bought at the same period for thirteen pounds a head; and, on comparison, it was found that the latter were much

cheaper kept, and that they improved much more in beef and fat in proportion to their size, than the high-priced cows. A decided preference was therefore given to the improved Ayrshire breed, from seven to ten years old, and from eight to twenty pounds a head. Prime young cows were too high-priced for stall feeding; old cows were generally the most profitable in the long run, especially if they were not previously in good keeping. The cows were generally bought when near calving, which prevented the barbarous practice called hafting, or allowing the milk to remain upon the cow for a considerable time before she is brought to the market. This base and cruel custom is always pernicious to the cow, and in consequence of it she seldom recovers her milk for the season. The middling and large sizes of cows were preferred, such as weighed from thirty-five to fifty stone, or from five hundred to eight hundred pounds.

According to Mr. Harley, the most approved shape and marks of a good dairy cow are as follows: Head small, long, and narrow towards the muzzle; horns small, clear, bent, and placed at considerable distance from each other; eyes not large, but brisk and lively; neck slender and long, tapering towards the head, with a little loose skin below; shoulders and fore quarters light and thin; hind quarters large and broad; back straight, and joints slack and open; carcass deep in the rib; tail small and long, reaching to the heels; legs small and short, with firm joints; udder square, but a little oblong, stretching forward, thin-skinned and capacious, but not low hung; teats or paps small, pointing outwards, and at a considerable distance from each other; milk-veins capacious and prominent; skin loose, thin, and

foods and, as described here, added in tiny amounts to milk to reduce souring.

**35** A dairy implement described in the text for finishing and removing buttermilk from butter; the book notes versions with a marble top and lever action that avoid hand contact with the butter-milk.

**36** A 19th-century dairyman cited in the chapter for experiments lowering butter and cream into a well to cool them; the text presents him as a practical observer rather than a named scientific authority.

**37** A small wooden cask historically used for packing butter; the chapter recommends white-oak firkins with hickory hoops holding about eighty pounds of butter (firkins are traditionally around 9–10 gallons).

**38** A specific kind of salt recommended by a New York butter dealer for seasoning butter (eight ounces to ten pounds); the name likely denotes a regional or trade variety and may refer to a particular source or brand rather than a chemical distinction.

**39** The scientific name given for the plant 'butterwort' mentioned in the text; the book reports that feeding a handful of this plant to cows in some Nordic regions was believed to make their milk coagulate more readily.

**40** A curdling agent made from the mucous membrane of a calf’s stomach (the 'bag' or 'maw') used to coagulate milk in cheese-making; modern rennet contains the enzyme chymosin and equivalent preparations are still used today.

**41** An older agricultural term for inflammation of the udder, now generally described as mastitis; the chapter

describes swollen, hot, and painful teats or udder often occurring after calving and associated with fever.

**42** A postpartum disorder of cows characterized by weakness and often inability to stand after calving; historically described here as an inflammatory ‘milk fever,’ and in modern veterinary medicine is commonly associated with metabolic disturbances such as hypocalcemia (low blood calcium).

**43** The text’s ‘Hoove’ (also printed as ‘Hoven’) denotes ruminal tympany or bloat, a dangerous distension of the first stomach (rumen/paunch) caused by fermentation and gas accumulation after eating lush forage.

**44** An older regional term used in the chapter for a respiratory cold or cough in cattle (catarrh), which the author warns can progress to more serious lung inflammation or 'consumption' if untreated.

**45** A broad hempen band described in the text that is fastened over a cushion on the dairymaid’s back and around the waist to hold milk-cans in place during transport, preventing the cans from pressing heavily on the body.

**46** A historical Dutch unit and vessel for milk; the accompanying footnote states that a Dutch can is 'a little less than our wine quart', i.e., roughly just under a quart (on the order of about 0.9–1.0 liters).

**47** Plural of 'gulden' (often anglicized as 'guilder'), the historical Dutch currency referenced here; its exact modern value varied over time and by region, so direct conversion to current units is uncertain.

**48** Butter described as "firkin-butter" is butter packed for sale in a firkin, a traditional small wooden cask used

historically for butter and other dairy goods; the term indicates the packing format rather than a special variety of butter.

**49** Beaumé’s aërometer is a hydrometer calibrated to the Baumé scale (invented by Antoine Baumé, 18th century) used to measure the density or strength of solutions such as lye and alum mentioned here.

**50** Annatto is a natural orange-red coloring obtained from the seeds of the tropical plant Bixa orellana, traditionally used as a food dye to give butter and cheese a yellow to orange hue.

**51** "Tournesol" in this context is a dye extracted from the plant Croton tinctorium (historically called turnsole) whose prepared rags were used to impart the characteristic red rind to Edam cheese and to deter insects on the surface.

**52** The "maw" refers to the fourth stomach (abomasum) of a young calf; strips of the dried maw were traditionally used to prepare rennet, the enzyme-containing substance for curdling milk in cheese-making.

**53** "Muriatic acid" is an old name for hydrochloric acid; the text notes it was sometimes used historically (especially for poorer cheeses) to curdle milk, though traditional rennet was preferred for many varieties.

**54** Refers to the Suffolk breed of pig, an English breed historically prized for early maturity and good fattening qualities and often used for crossing with larger sows.

**55** The Berkshire is an English pig breed, originating in the county of Berkshire, known in the 19th century for its meat quality and for influences from Chinese stock in its development.

**56** Here denotes the Essex pig (from the English county of Essex), an improved local breed in the 19th century valued by some dairymen for rapid maturity and early fattening.

**57** A contemporary, somewhat derogatory term in the text for inferior or unimproved farm hogs—typically long-snouted, lean-bodied crossbreds common on some farms in the period.

**58** The author of the appended statement on dairy management; he is presented as a mid-19th-century English dairy practitioner (active in the 1850s) whose observations are quoted in the chapter.

**59** An historical name for oil pressed from rapeseed (plants of the genus Brassica); the modern equivalents are rapeseed oil and, in many markets, canola oil (a low-erucic acid cultivar of rapeseed).

**60** In the 19th-century chemical usage in this text, 'margarine' denotes the solid fat fraction (stearine) of oils, contrasted with the liquid fraction 'oleine'; this is different from the later manufactured butter substitute called margarine (developed commercially in 1869).

**61** Refers to Alderney cattle, a small Channel-Islands dairy breed historically valued for very rich milk and butter; the original Alderney type was largely lost or absorbed into other Channel Island breeds (such as Jersey and Guernsey) by the late 19th/early 20th century.

**62** The pressed oil-cake left after extracting oil from rapeseed (Brassica napus), used historically as a high-protein, oil-rich cattle feed; composition varied by origin and