said I to myself, "that I may not be found so ready for this family bargain. A love that is to be had like a bale of goods is not exactly the love to suit my taste." But then, when I met her again in the morning, I could no more have quarrelled with her than I could have flown.

I was inexpressibly charmed with the whole city, and especially with the house in which Mr. Daguilar lived. It opened from the corner of a narrow, unfrequented street—a corner like an elbow—and, as seen from the exterior, there was nothing prepossessing to recommend it; but the outer door led by a short hall or passage to an inner door, or *grille*, made of open ornamental iron-work, and through that we entered a court, or *patio*, as they called it. Nothing could be more lovely or deliciously cool than was this small court. The building on each side was covered by trellis work; and beautiful creepers, vines, and parasite flowers, now in the full magnificence of the early summer, grew up and clustered round the window. Every inch of wall was covered, so that none of the glaring whitewash wounded the eye. In the four corners of the *patio* were four large orange trees, covered with fruit. I would not say a word in special praise of these, remembering the childish promise she had made on my behalf. In the middle of the court there was a fountain, and round about on the marble floor there were chairs, and here and there a small table, as though the space were really a portion of the house. It was here that we used to take our cup of coffee and smoke our cigarrettas, I and old Mr. Daguilar, while Maria sat by, not only approving, but occasionally rolling for me the thin paper round the fragrant weed with her taper fingers. Beyond the *patio* was an open passage or gallery, filled also with flowers in pots; and then beyond this, one entered the drawing-room of the house. It was by no means a princely palace or mansion, fit for the owner of untold wealth. The rooms were not over large, nor very numerous; but the most had been made of a small space, and everything had been done to relieve the heat of an almost tropical sun.

"It is pretty, is it not?" she said, as she took me through it.

"Very pretty," I said. "I wish we could live in such houses."

"Oh, they would not do at all for dear old fat, cold, cozy England. You are quite different, you know, in everything from us of the south; more phlegmatic, but then so much steadier. The men and the houses are all the same."

I can hardly tell why, but even this wounded me. It seemed to me as though she were inclined to put into one and the same category things English, dull, useful, and solid, and that she was disposed in talking to me to show an appreciation for such necessaries of life; but that she had another and inner sense—a sense keenly alive to the poetry of her own southern clime, and that I, as being English, was to have no participation in that. An English husband might do very well, the interests of the firm might make such an arrangement desirable, such a '*mariage de convenance*—so I argued to myself—might be quite compatible with—with Heaven only knows what delights of super-terrestrial romance, from which I, as being an English thick-headed lump of useful, coarse mortality, was to be altogether debarred. She had spoken to me of oranges, and having finished the survey of the house, she offered me some sweet little cakes. It could not be that of such things were the thoughts which lay undivulged beneath the clear waters of those deep black eyes—undivulged to me, though no one else could have so good a right to read them—it could not be that that noble brow gave index of a mind intent on the trade of which she spoke so often! Words of other sort than any that had been vouchsafed to me must fall, at times, from the rich curves of that perfect mouth.

So felt I then, pining for something to make me unhappy. Ah, me! I know all about it now, and am content. But I wish that some learned pundit would give us a good definition of romance, would describe in words that feeling with which our hearts are so pestered when we are young, which makes us sigh for we know not what, and forbids us to be contented with what God sends us. We invest female beauty with impossible attributes, and are angry because our women have not the spiritualised souls of angels, anxious, as we are, that they should also have human affections. A man looks at her he would love as he does at a distant landscape in a mountainous land. The peaks are glorious with more than the beauty of earth, and rock, and vegetation. He dreams of some mysterious grandeur of design which tempts him on under the hot sun, and over the sharp stones, till he has reached the mountain goal which he had set before him. But when there, he finds that the beauty is well nigh gone, and as for that delicious mystery on which his soul had fed, it has vanished for ever!

I know all about it now, and am, as I said, content. Beneath those deep black eyes there lay wells of love—good, honest, homely love—love of father, and husband, and children that were to come—of that love which loves to see the loved ones prospering in honesty. That noble brow—for it is noble, I am unchanged in that opinion, and will go unchanged to my grave—covers thoughts as to the welfare of many, and an intellect fitted to the management of a household; of servants, namely, and children, and, perchance, a husband. That mouth can speak words of wisdom, of very useful wisdom—though of poetry it has latterly uttered little that was original. Poetry and romance! They are splendid mountain views seen in the distance. So let men be content to see them, and not attempt to tread upon the fallacious heather of the mystic hills.

In the first week of my sojourn in Seville I spoke no word of overt love to Maria, thinking, as I confess, to induce her thereby to alter her mode of conduct to myself. "She knows that I have come here to make love to her—to repeat my offer; and she will, at any rate, be chagrined if I am slow to do so." But it had no effect. At home, my mother was rather particular about her table, and Maria's greatest efforts seemed to be used in giving me as nice dinners as we gave her. In those days I did not care a straw about my dinner, and so I took an opportunity of telling her. "Dear me," said she, looking at me almost with grief, "do you not? What a pity! And do you not like music either?" "Oh, yes, I adore it," I replied. I felt sure at the time that had I been born in her own sunny clime, she would never have talked to me about eating. But that was my mistake.

I used to walk out with her about the city, seeing all that is there of beauty and magnificence. And in what city is there more that is worth the seeing? At first, this was very delightful to me, for I felt that I was blessed with a privilege that would not be granted to any other man. But its value soon fell in my eyes, for others would accost her, and walk on the other side, talking to her in Spanish, as though I hardly existed, or were a servant there for her protection. And I was not allowed to take her arm, and thus to appropriate her, as I should have done in England. "No, John," she said, with the sweetest, prettiest smile, "we don't do that here; only when people are married." And she made this allusion to married life, out, openly, with not the slightest tremor on her tongue.

"Oh, I beg pardon," said I, drawing back my hand, and feeling angry with myself for not being fully acquainted with all the customs of a foreign country.

"You need not beg pardon," said she; "when we were in England we always walked so. It is just a custom, you know." And then I saw her drop her large dark eyes to the ground, and bow gracefully in answer to some salute.

(To be concluded in our next.)

ECONOMY OF STEAM.

EVERYTHING that relates to this subject is of general importance, because the steam-engine is so universally and diversely employed to subserve the purposes of commerce and the arts. It would naturally be expected that with the advancement of knowledge and discovery, the opinions of scientific and practical men, as to the best methods of applying steam would be more correct and uniform than heretofore. This, however, is not the case; the opinions are both various and contradictory, yet an uniform sentiment prevails as to the small amount of power obtained in proportion to the fuel consumed for engines, thus admitting that there is great room for improvements. That there is a decided gain to be obtained by working steam expansively, is very easy of calculation. Supposing we use steam of 30lbs. pressure in a cylinder, and cut off at one-fourth of the stroke, we obtain an average pressure of 41·65lbs. Unless there is a great loss sustained by condensation during expansion, it is evident there must be a saving of about 50 per cent. of the steam. With regard to the employment of high-pressure steam, there is great economy, when worked expansively. If steam at 50lbs. pressure is cut off at half-stroke, it will exert an average pressure of 37·5lbs.; while the same weight of steam at 25lbs. pressure without being cut off, will operate with a pressure of 12½lbs. less. In the former case the steam is expanded in the cylinder, in the latter it may be said to have been expanded in the boiler. The liquefaction of steam by simple expansion is a new theory, claimed to have been discovered about the same time by Professor Rankine, of Scotland, and Clausius, of France. Steam, however, does not liquefy in any boiler until its temperature is lowered below 212°, a result which does not take place by expansion, while the pressure is maintained above that of the temperature. Various ideas are afloat regarding the meaning of super-heated steam; but to adopt the definition of Mr. J. Frost, it consists of "common steam, subjected to a higher temperature than itself, out of contact with water." The employment of this steam in cylinders, in place of common or saturated steam, effects quite a saving of fuel, and is becoming quite common on board steamers. Another condition or method of employing steam, lately introduced, is the "wethered system." It consists in using super-heated and common steam in combination in the cylinders of engines. The steam has been applied to the British screw frigate Dee, and the result of 20 experimental voyages, gave with combined steam 500 H.P., in the engine; with super-heated steam alone, 409 H.P.; and with common steam but 404 H.P. The combined steam has been also applied to a non-expansive engine, and the consumption of fuel fell from 35 to 24 cwt. per week. Viewing the question of steam economics from various points, it appears evident that a great saving is effected by using high-pressure steam, super-heating it, and then working it expansively in the cylinder. Boilers can be made to withstand a pressure of 100lbs. per inch as easily as 20lbs.; therefore safety depends altogether on the construction of the boiler.

FOOD FOR CATTLE.

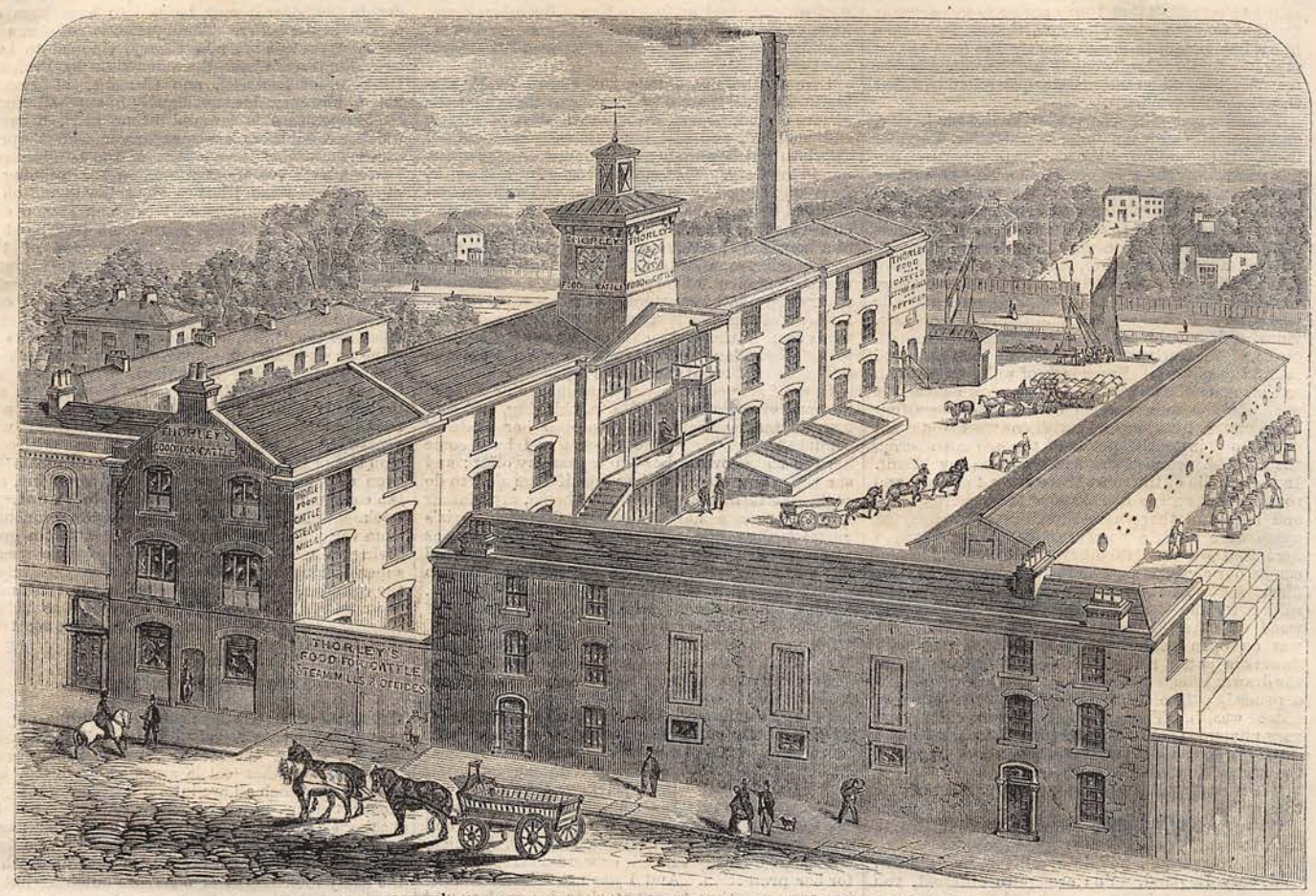
CATTLE food is a subject of great public importance; it concerns everybody—not only the grazier, but the dealer, the butcher, the consumer—and, therefore, whether cattle are well or ill fed, is a question in which all are interested. We want good meat; tender, nutritious, healthy meat—not the meat yielded by prize oxen labouring under mountains of fat, nor that of the lean beasts who have only been saved from a premature natural death by the hasty interference of a carcase butcher—but we want meat that we shall not be ashamed to set on our tables, nor afraid to eat. And good meat is produced only by cattle in good condition; and cattle only are in good condition when they are well fed; when the bright eye and the silken hide tell that they are in health and vigour; and so we are brought back to the point from which we started, namely, that the question of cattle food is one of public importance.

Liebig, Graham, and other chemists; Carpenter, and other physiologists, tell us that the meat of unhealthy animals is poisonous; that meat which does not contain osmazome cannot be digested, and that a considerable proportion of meat sold in our markets is destitute, or almost destitute, of this essential quality. Now it may naturally be asked by the general reader—What is osmazome? The word is of Greek origin, and means a "smell of soup." The substance, according to Pereira, is "an alcoholic extract obtained from the flesh, brain, and other parts of animals; it has a reddish brown colour, and the smell and taste of soup . . . . To this principle broths and soups owe their flavour and smell, and part of their nutritive qualities."

It is a well-known fact, that the healthiest animals are those whose flesh contains the largest amount of osmazome. It is flesh of this kind that fetches the best price in the market, and appears as the best meat at table; and it is that which contains the least of it, that, at the worst, would be rejected from a sportsman's dog-kennel—and, at the best, yields an abundance of parings for the tallow-melter.

The question immediately arises, By what means is this marvellous osmazome formed? Where are the substances of which it is the produce to be found? And the answer is plain, if, at first sight, it is not very satisfactory: animals derive it naturally from the condimental substances of plants. It is not contained, however, in the ordinary food of cattle. When they get it they find it for themselves, or it is supplied to them in an artificial form. That they require it there can be no doubt, not only from the result, but from the peculiar instinct which leads them, when favourably circumstanced, to select those plants which produce it. Two or three curious instances of the efficacy of certain condimental plants may be given.

The late Sir Alexander Burnes tells us that in his



THORLEY'S CATTLE FOOD MANUFACTORY, CALEDONIAN ROAD, LONDON.

travels he found that the far-famed Sylphion of the Greeks was as greedily devoured by sheep as in the days of Alexander, and was as fat-producing as ever. Dr Lindley tells us the same story in his "Flora Medica," quoting not only Burnes, but other authorities. Dr. Lindley also, in one of his invaluable works, writes thus of the camel thorn:—"Such is the importance of this plant, as a food for cattle, that the Affghans, who call it Ka-ri-shutur or Jaursa, believe that the serious loss of those animals, experienced in the Affghan operations, arose from the want of this plant." The same author tells us that in Russia *spurrey seeds* "are bruised and given to horses and milch cows, whose milk they increase in quantity and improve in quality." And again, that "*Saponaria vaccaria*" is said to increase the lacteal secretions of cows fed upon it; while Lindley, Thompson, and Pereira say the same thing of aniseed—at least, as regards the human system. Captain Speke says of the fat-tailed Dhumba sheep, "I was much struck with the sleekness of the sheep, considering there appeared nothing for them to live upon; but I was shown among the stony ground here and there a little green, pulpy-looking weed, called Buskàlé, succulent, and, by repute, highly nutritious. It was on this they fed and throve. These Dhumba sheep, the fat-tailed Persian breed, appear to thrive on much less food, and can abstain longer from eating than any other; this is, probably, occasioned by the nourishment they derive from the fat of their tails, which acts as a reservoir, regularly supplying, as it would necessarily do, any sudden or excessive drainage from any other part of their system."

Numerous other instances of the avidity with which these condimental plants are seized upon might be given, but it is unnecessary to multiply examples. The fact is as clearly established as any fact can be, by any evidence, that animals require a certain amount of condiment, and that they become proportionably less valuable for work and food as that condiment is denied. Chemical investigation goes to show that certain plants contain certain properties; that the result of a combination of these properties is the osmazome of healthy animals. Experience teaches us that the flesh of wild animals is generally better than that of tame, and the conclusion to which we are brought is, that animals, in their wild state, seek out for themselves plants which are good for them, and thus instinctively supply themselves with that which they do not usually obtain when fed by man.

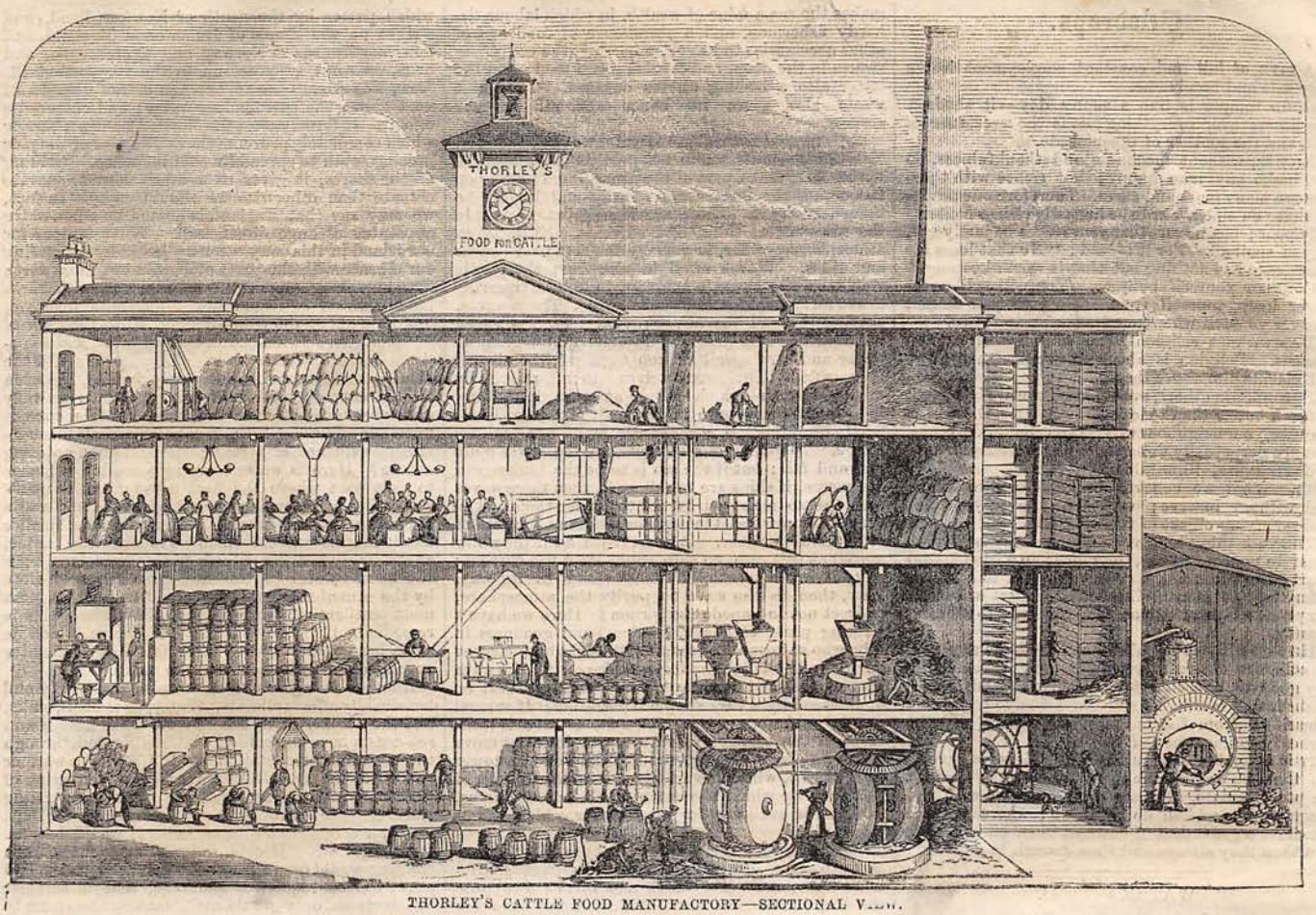
But what is denied to domestic cattle in one way may be supplied in another. If cattle require condiment, if it is really essential to them, cannot some system of cattle cookery be introduced and universally applied?

Efforts to introduce some such system have been made. Arthur Young, Dr. Hunter, Dr. Anderson, Sir Humphry Davy, and others, advocated the principle. Chemistry was applied to agriculture with immense success, but not without opposition—opposition which has not been entirely overcome yet. That progress, however, has been made, is encouraging, and that progress is evidenced by the fact that the judges at the different agricultural shows lately held have come to the conclusion that cattle condiment is an article which they can no longer do without in the economical production of butcher's meat; that animals of all kinds extract more nourishment from hay and straw seasoned with condiment than from unseasoned food, although the latter may contain a much greater amount of alimentary matter.

The demand for cattle food has lately been very much on the increase, and a new branch of manufacture and commerce has started up. Foremost amongst those who have turned their attention to this important subject is Mr. Joseph Thorley—whose name is now so well known and so justly celebrated on both sides of the Atlantic. After being nine years in one of the largest and most respectable houses in Hull, in the corn, cake, seed, and manure trade, Mr. Thorley commenced business on his own account, and was successful. Daily intercourse with farmers and graziers made him familiar with their wants, and he exerted himself to the best of his ability to supply what he saw was requisite. He invented a farinaceous cattle food, called Thorley's Mixture, and sold it at £12 per ton. It was highly approved, and made its inventor quite famous in the locality and throughout Yorkshire generally; but unwilling to remain satisfied with his triumph, Mr. Thorley pursued his investigations, and after much research, much careful painstaking and hard labour, discovered the secret of the condimental substance now known everywhere as Thorley's Food for Cattle.

Cattle *food*, however, is a misnomer; it is simply a condiment or seasoning, and is essentially neither food nor physic. Beef and mustard may be described as food, but "not the *mustard* without the *beef*." But the dietetic uses of the condiment cannot be over-estimated; they have given Mr. Thorley a world-wide reputation, and have won for him prizes, and medals, and favourable notices everywhere—excepting from a limited section of captious critics and of old-school farmers.

In a large, handsome building in the Caledonian Road, King's Cross, on the bank of the Regent's Canal, Mr. Thorley compounds his food for cattle, and from that central point he sends out so many hundreds and thousands of tons, that his steam engine has a heavy time of it to keep pace with the demand. It is not a pretentious building, this structure, the head-quarters of cattle cookery, but is capitally arranged, ably managed, and is in every part so scrupulously clean and bright, that many a human kitchen might take a useful lesson from it. There is a large yard leading down to the canal, having Thorley's manufactory on one side, and his stables and outhouses on the other. Very convenient is the canal, the water carriage effecting a considerable saving of expense, which would otherwise be incurred by land traffic. An ascent of a few steps leads us to the most important part, though not the most impressive looking part, of the establishment. It is a room rather dark and very hot, and there—for it is Thorley's chamber of mystery—are the materials for the condiment, the spices, and plants, whose aromatic essence imparts to the "food" its remarkable qualities. What are these spices? That is Thorley's secret; but it may be well to notice, that Dr. Hassall, having been requested to make an analysis, reports—First, That the ingredients used are all of excellent quality, and are purchased without regard to expense. Second, That the receipt or formula, according to which the food is prepared, is an ad-



THORLEY'S CATTLE FOOD MANUFACTORY—SECTIONAL V...W.

mirable one, no ingredient being selected on account of its cheapness, but those only being chosen which are best adapted to fulfil the objects intended; and that it possesses the following properties in an eminent degree: It is highly nutritious and fattening—it is a tonic and gentle stimulant, aiding, when mixed with other descriptions of food, materially the digestive powers of an animal—a point of great consequence, since it is an undoubted fact, that much of the nourishment contained in the ordinary food given to cattle is lost, in consequence of the impaired or defective action of the digestive organs.

Of the staple articles in the food, the manufacturer makes no secret. Leaving his chamber of spices, we are shown excellent samples of Indian corn, the locust bean, and linseed cake; the first from the Black Sea, the second from Sicily, Italy, or the south of France, the third from America. The importance of procuring the best materials induces the maker to have his cake from the United States, as being purer than that to be obtained in England.

To grind up these materials in two powerful mills, worked by an engine of 25 horse power, is not in any degree a difficult matter. But it is not an easy thing to grind them together in such proportions, to add the exact quantity of aromatic condiment, to prepare them in such a way as to retain all the good qualities of each ingredient, and preserve the volatile essence of the spices. But this is done at the factory without any apparent effort. The staple materials are shoveled into the mill, the huge stones, one pair faced with iron, crush them into powder, the aromatic portion is added and thoroughly blended with the whole, so rapidly and so perfectly that in the course of a few minutes the crude material is converted into cattle condiment.

By an ingenious arrangement the food is conveyed from the mill to the top of the premises; there, by a simple process, it is freed from all refuse matter, and is lowered into bins to cool, and, after remaining in the bins for a couple of days, it is ready for use. The refuse matter was formerly regarded as useless, but it is now turned to excellent use, and forms, if boiled or soaked for a few hours in water, a capital food for pigs.

The food having been manufactured and duly cooled in the bins, does not long remain on the premises. The great demand for the article saves the manufacturer the cost of large store-houses, and the purchaser from the risk of buying stale food—not that there is much fear in that respect, for the food will keep well for a twelvemonth, if unopened and kept free from *the atmosphere*. The packing of the article forms a large part of the work at the factory. On the ground floor there are extensive premises used as a cooperage, where the barrels and half-barrels are made up. Up-stairs is a large packing-room, where upwards of thirty girls are busily at work making the food into small packages, neatly labelled, and containing full directions for use. On an average, these girls earn ten or twelve shillings a-week. Adjoining the packing-room is a store-room for paper—blue paper, brown paper, yellow paper, paper printed, paper unprinted, labels and directions, and tin-foil paper—all in large stacks or huge parcels; for a great amount of paper is used in the establishment, which would be, consequently, all the richer if the Legislature left off taxing it. In the yard there are great crates from Yorkshire potteries; crates full of mugs—printed with a view of the premises and ample directions for the use of the food. One of these mugs—a half-pint measure for the food, with Joseph Thorley's signature burnt thereon—is put into every keg or barrel made up, together with papers or pamphlets bearing on the question of cattle cookery; for Mr. Thorley is evidently an agricultural reformer, and is not only anxious to sell his food, but to disseminate his principles.

Without entering into further detail as to the management of the manufactory, we may remark that no expense is spared to make the food of the best materials, and to supply the purchaser with the best information about it. In the manufacture of the food nearly one ton in four goes for waste, or rather did so until Mr. Thorley found out a means for turning the refuse to account. Such being the case, the price has been considered high, especially as other "cattle food" was sold at a less cost. But the price of an article is either dear or cheap, according to its value; and an inferior article is not cheap at any price. The cost, however, since the refuse has been turned to account, has been reduced 20 per cent.; and a cask containing 448 feeds, and weighing nett 1 cwt., sells for 40s.; and this includes the cask, which is carriage paid to any railway station in the United Kingdom.

There can be no doubt that condimental compounds for seasoning the food of live stock are found of immense value. That agriculturists should have gone on so long without attempting to supply this want, is a striking and singular fact. Cattle cookery is really as essential as cookery for man, and those who complain of the use of condiments for live stock might just as well exile the cruet-stand from their own dinner-tables. Science suggests to Agriculture the employment of condimental food. Enterprise sets to work, and produces an article which professes to be the thing that is required. Experience tests it, and in all quarters the result is the same. Thorley's Cattle Food is the compound that answers best; it restores health, imparts strength, gives animation, lays on flesh evenly, makes the horse more fit for work, the cow more profitable to the dairy, the ox and sheep the better for the market. These are the testimonials which are given by scientific and practical men, and of all conditions, as the food is used with the best results on the Prince Consort's farm and in Windsor stables.

In conclusion, we may remark, that the introduction of this new branch of manufacture is a striking example of the progressive spirit of our age. A want is felt, and to supply that want a new branch of industry arises—one that involves a vast amount of fine machinery, and no little pharmaceutical knowledge to work it; for the rich aromatic and other condimental properties which give to the material its real value, may be greatly injured, if not wholly lost, in the grinding, if the greatest care is not taken. That such care is taken at the manufactory in the Caledonian Road is proved by the wide-spread popularity and immense success which have attended the sale of Thorley's Food for Cattle.