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GROUND PLAN OF A PIGGERY.

Fig 4

Fig 3

Fig 2

SIDE ELEVATION, FRONT VIEW, &c.

FARMERS' SERIES.

VOL. I.

AMERICAN SWINE BREEDER.

BY

H. W. ELLSWORTH.

THE BERKSHIRE HOG.

IMPROVED CHINESE HOG.

THE
AMERICAN
SWINE BREEDER,
A
PRACTICAL TREATISE
ON THE
SELECTION, REARING AND FATTENING
OF
SWINE.

BY HENRY W. ELLSWORTH.

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PUBLISHERS' NOTICE.

The present volume is the first of a series of books for the practical farmer,—under the title of *Farmers' Series*. It will soon be followed by works on FARMING, GARDENING, MANURES, &c. &c.

December 15, 1839.

TO
ELIAS PHINNEY, Esq.

OF
LEXINGTON, MASS.

WHOSE
SUCCESSFUL EFFORTS HAVE EARNED FOR HIM THE TITLE
OF
A SCIENTIFIC AGRICULTURIST,

AND
WHOSE MANY VIRTUES HAVE ENDEARED HIM AS A FRIEND,

THIS VOLUME
IS
RESPECTFULLY INSCRIBED

BY HIS OBEDIENT SERVANT,

HENRY W. ELLSWORTH.

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AMERICAN SWINE BREEDER.

CHAPTER I.

Object of the work—Three species of swine peculiar to the old Continent and its islands—Different breeds of England—Those of this country.

THE object of the following pages is to present, within narrow limits and under proper heads, both general information and practical directions, in regard to the selection and management of SWINE; and to furnish, as it were, a digest, which the reader can consult at ease, of the results attending numerous investigations and experiments on this interesting subject, whose records are now scattered too diffusely for general reference throughout the multiplied agricultural periodicals of the day.

Three species of the genus *Sus* are mentioned by naturalists as peculiar to the old Continent and its islands, and are classed as follows:—*

1. *SUS BABYRUSSA*.—The Babyrussa confined to the Indian Archipelago.

* Vide Elements of practical Agriculture by David Low. Lond. Ed. 1838, p. 595. Pennant's Hist. of Quadrupeds, Lond. Ed., 1793, article Hog. Reese's Encyclopedia, article Swine.

2. *SUS LARVATUS*.—The African Boar, a very fierce and powerful creature, living in holes and never yet domesticated.

3. *SUS APER*.—The wild Boar.

Of these species, the latter is the one most generally distributed, and forms the parent stock of the domestic hog and its numerous varieties.

The first mentioned species is noticed by several ancient writers, by Pliny and Aelianus,* as well as by numerous naturalists of a later date.

Pennant, in his *History of Quadrupeds*, furnishes a full length portrait of the animal. He is described as coarsely made, distinguished by two tusks of about eight inches in length, projecting from the lower jaw and pointing towards the eyes; also by two teeth placed in sockets on the outside of the upper jaw, about eight inches long, which bend like horns and almost touch the forehead. His ears are sharp pointed and erect, and his body covered with a species of wool, resembling that on lambs.

The second species is the "*Sus Ethiopius*" of Linnæus, and the "*Sanglier de cape Verd*" described by Buffon. He is armed with four tusks similar to those of the *Sus Babyrussa*, but differs from that animal in the total want of fore-teeth, which deficiency is remedied, to some extent, by extreme hardness of the gums. He has great size and breadth of head. His hoofs also are

* Vide Plinii. lib. viii. c. 52. Aelian, lib. xviii. c. 10. Bontiu's Hist. India. Valentine's Hist. of the East Indies. Buffon, xii. 379, tab. xlvi. — Le Babiroussa.

entirely undivided: beneath each eye are found hollows of loose and wrinkled skin, and under these large lobes or wattles, of such size and so placed as to prevent the animal from viewing any object immediately beneath him.

Great numbers of this animal are found in the hottest portions of Africa, and they occasionally wander to within short distances of the Cape. They are called by the Hottentots, *Kannucha*. They are also met with in the isle of Madagascar.* Owing to their extreme wildness, little is known of their history and habits. They are described as extremely ferocious, and living generally beneath the ground, which they remove with the same expedition as the mole. In a few instances, crosses between them and the Chinese or other sows have been attempted, but invariably without success; the trial resulting in the dismemberment or great injury of the animal to which they were introduced.

There is yet another species peculiar, it is believed, to South America. We refer to the Mexicanus *Moscilferus*, or Mexican Musk Hog. Like the *Sus Babyrussa*, this animal also has four tusks, but those of the upper jaw point downwards, and are hardly apparent when the mouth is closed, while the lower tusks are always hidden. The bristles covering the body are stronger than those of the European kind, and resemble those of the Hedge-hog. They are in general of a dusky color, and surrounded with rings of white. They are without tails,

* Vide Flarcourt, Hist. Madagascar. p. 152.

and on the lower part of the back is a gland, open at the top, which discharges a fetid ichorous liquor.* These animals are generally found in great droves, and several instances are related of fierce encounters between them and the Jaguar or American Leopard. They are said to feed on 'roots, toads and all manner of serpents,' which they hold with the fore-feet and skin with great dexterity. If the dorsal gland is extracted as soon as the animal is killed, the flesh, according to some writers, may be eaten; otherwise the meat becomes immediately infected. These animals are also called the *Pecay Breed* or American Pecay, undoubtedly a corruption of the Indian name *Paquiras*.† Though these animals originally inhabited the hottest parts of South America, they have been by degrees scattered to a wide extent, and at the present time are occasionally met with by parties journeying west of the Mississippi, and more especially by those who cross the Rocky mountains.

To trace the origin and progress of the numerous European varieties of the domestic hog, though interesting, is foreign to the purpose of these pages. Those who are desirous of investigating the varieties referred to, and especially those of England, are referred to the first portion

* This gland has been erroneously called a navel. In Purchas's Pilgrimage vol. 3. p. 886 and 966, these animals are termed "Hogs with navels on their backs," and the American Edition of Moubray on Poultry, p. 157, contains the same mistaken appellation.

† Vide Pennant's History of Quadrupeds.

of the able article on swine in Reese's Encyclopedia. The following extract from Low's Elements of Agriculture, will furnish correct and ample information, as to the most distinguished breeds of England.

“The breeds of this country, as may be supposed, are very numerous. Those which may be referred to as illustrating the differences of size and character in the animals, are the following:—

1. The native hog of the highlands of Scotland.

2. The Chinese hog.

3. The old English hog.

4. The Berkshire hog.

5. The Suffolk hog.

The native breed of the highlands and islands of Scotland consists of a small race, of a dun color, with erect ears, rounded back, low shoulders and with coarse bristles along the spine. They resemble the wild hog in their general form. They are usually left to search for their own food; and they will graze on the hills like sheep, and find their way to the shore on the ebbing of the tide to feed on sea weed. They are far inferior to the improved varieties of the lower country, but they fatten when supplied with proper food more readily than their rough exterior would indicate.

The Chinese hog is of the widely extended Siamese breed of the east, a race which extends from the continent to the island of Sumatra, New Guinea and others, and to all the islands of the South Seas. The true Siamese breed has the

skin of a rich copper color, but like all domesticated animals, the color varies with the conditions of climate, food and culture. In China, the color is often white, and it is with the varieties derived from China that we are most familiar in this country. The Chinese hog is for the most part less than the common swine of Europe, but is distinguished by its peculiar aptitude to fatten. Its bones are small, its limbs short, its ears erect, its skin and bristles soft, and its general aspect delicate. The introduction of this race has insensibly produced a great change in the character of all the breeds in this country. It has been made to cross the great number of them. It has diminished the size, but removed the former coarseness of form, and increased the aptitude to fatten. *The pure breed is little cultivated*, and it is through the medium of its crosses that its value is chiefly known. In this respect, the introduction of the eastern hog into England has been singularly beneficial.

The Old English Hog may be held to be the type of the ancient swine of England. It is distinguished by its great size, its lank form, and its pendant ears. Remnants of this unimproved race are yet to be found, but for the most part they have given place to the more improved variety. Although of defective form and slow feeders, the females are admirable nurses of their young; and when crossed by improved males, as the Berkshire, they produce a progeny possessing the aptitude to fatten, of the male parent, with the large size of the dam.

The Berkshire was the earliest of the improved breeds of England, and is now the most generally diffused of all others. It was undoubtedly formed by a mixture of the eastern hog with the ancient swine of the country. The great improver of this breed was Mr. Astley of Oldstonehall. The modern Berkshire, however, is of less size than the older breed; but still the animals are of the larger class of swine. Their common color is a reddish-brown with dark spots. Many of the breed are nearly black, manifesting their near approach to the Siamese character; and sometimes they are black, broken with white, indicating the effect of the cross of the white Chinese. The Berkshire are justly regarded as one of the superior breeds of England, combining good size with aptitude to fatten; and their flesh is fitted for pork or bacon. In Yorkshire, Lincolnshire, and other eastern counties, there are breeds of a larger size, of a white color, and with pendent ears. They have been all, more or less, affected in their size and character by crossing.

A variety termed the *Suffolk* is so named from the county of Suffolk, which has long produced great quantities of pork, chiefly for the supply of London. The Suffolk hogs have been crossed again and again with the Chinese, or the descendants of the Chinese crosses, *so as to reduce the size* to suit the tastes of the consumers.

A breed has lately been received, termed the *Neapolitan*.* The animals are of a small size,

* For further information in regard to these and other valuable breeds of England, vide Reese's Encyclopedia, article

of a round and delicate form. Their skins are of a coal black color, and at the first introduction they are almost entirely destitute of bristles, but when several times bred in England the bristles come. They have a great aptitude to fatten, and have on this account been received with favor; and they produce good crosses with the native stock. They are probably of African origin.*

Considering his extraordinary fecundity and adaptation to all climates, the ease and cheapness with which he is reared (thriving almost equally well on animal and vegetable food) and the facility with which he is conveyed from one place to another, it is indeed surprising that so little is known in this country of his history and habits, and such slight attention paid to the improvement of so valuable an animal as the Domestic Hog. To a great extent, among many of our farmers, has the hog been considered as a subordinate species of live stock—a mere consumer of the refuse of the kitchen, whose presence must be tolerated as a necessary evil. The vast improvement to be effected by the importation of new varieties, or judicious crosses among those easily procured, seems to have almost culpably escaped the attention of those with whom the improvement of all other kinds of stock has been a subject of intense and constant reflection. Natural History abounds with singularly minute details of the

Swine, and Farmer's Cabinet, Philadelphia Ed. v. 2, pp. 281 and 315.

* An importation of this excellent breed has recently arrived at Philadelphia.

habits of many rare, and in an agricultural point of view, apparently useless animals. Volumes have been written on the breeds, the treatment and diseases of sheep. Treatise after treatise on cattle has been multiplied, exhibiting in detail the change effected by judicious and continued crossings, to so great an extent that the distinguishing characteristics of the parent stock are scarcely to be recognised in their descendants while, with perhaps a solitary exception,* little has been offered to the public, calculated to furnish practical information in regard to swine. It is true that now and then we find articles discussing different points connected with these neglected animals, scattered amid the pages of our valuable agricultural periodicals. It is also true, if enjoying free access to books and sufficient leisure, that we can, as the result of prolonged investigations, gather at one time much of interest, regarding the origin and habits of swine as the subjects of Natural History; at another many facts calculated to aid or govern our estimate of the comparative value of improved varieties; and again, sound practical directions as to the best mode of treatment to secure the utmost limit of perfection. But the attainment of knowledge by a process involving such expenditures of time and research, is impracticable to the many, and sufficiently irksome to the few whose situation authorizes and whose wishes lead them to attempt it, to excite a deep regret, that instead of scattered truths, and disconnected facts, though important in themselves, no plain, prac-

* Henderson on Swine.

tical, and connected treatise on a subject so important can be found:

Frequent importations and repeated crossings on them, have produced within the last few years numerous breeds of swine in this country, of which perhaps the most important and most generally known are as follows:—

1. THE BERKSHIRE HOG.
2. THE ORIGINAL AND IMPROVED CHINA.
3. THE BEDFORD OR WOBURN HOG.
4. THE MACKAY HOG.
5. THE RUSSIAN HOG.
6. THE LEICESTER HOG.
7. THE IRISH GRAZIER HOG.
8. THE BYFIELD HOG.
9. THE MOCO HOG.
10. THE GRASS BREED HOG. To which more recent importations have added,
11. THE BELTZ HOG.
12. THE NEAPOLITAN HOG.

Independent of these will be found many varieties, whose reputation is confined to less extended limits, the descendants of some of the above breeds intermingled with the ordinary ones of the country.

THE BERKSHIRE HOG. The merit of first introducing this valuable animal into the United States, and more recently of procuring new varieties to cross with those already imported, is due to L. Hawes, Esq. of Albany. It is the opinion of many who have had sufficient opportunities of examining the first and second importations, that the latter and its crosses show an advance on the original Berkshire nearly as great as was conceded to that on the ordinary breeds of the

country. For more minute investigation, we refer our readers to a plate of the improved Berkshire given in the fourth volume of the Cultivator, and to correspondence with Messrs. L. Hawes and John Lossing of Albany, both of whom have recent importations.

The Berkshire has been crossed repeatedly with the stock of the country, and its varieties are perhaps more generally known and sought for than those of any other breed. The high estimation in which this breed is held, will readily appear from the perusal of testimonials like the following, given as the results of experiment, and by those whose statements are entitled to the utmost confidence.

The report of N. C. Bement, Esq., of the committee on swine, published in vol. 6, page 31, of the Cultivator, in assigning to the Berkshire a decided superiority both in England and America over all other breeds, continues in the following language:—"The history of the introduction of this breed among us was stated in the report upon swine made at the last meeting of this society. Since that time, the demand for this breed of pigs from almost every state in the union has greatly increased, and prices in some cases have almost exceeded credulity. Two hundred and fifty, three hundred, and even five hundred dollars a pair have been paid for them. Nor have they been found deficient in weight when they have had time to mature their growth. They have been fattened to weigh five, six, and seven hundred pounds, and one was brought to this market last week from Fulton county, purchased of Judge Buel, a little

more than one year old, which weighed when dressed 633 pounds, the carcase of which sold in market for \$56. But it is not the great weight which this breed of hogs is brought to that gives them their great intrinsic value. They are docile, quiet, come early to maturity, have but little offal, give a large and excellent ham, one of the most valuable parts, sweet, sound, high flavored pork, and it is believed make as great if not greater returns for the food consumed than any other breed amongst us.

"In corroboration of the high opinion entertained of this breed of hogs, I will state that Col. Williams, a spirited and wealthy gentleman, residing on Long Island, desirous of procuring a superior breed of hogs, wrote to his friend and agent in Liverpool to procure for him, *without regard to price, six pigs of the best breed in England*, and take time and satisfy himself before purchasing. After diligent enquiry, his friend finally settled on the Berkshire, as being considered, taking all things into view, the best and most improved breed, and purchased seven, four males and three females, being the entire litter (the owner refusing to sell a part) and forwarded them to New York, where they arrived in October last."

Of similar import is the following from the Franklin Farmer, vol. 2. No. 52, pp. 412, 413. "In point of *form* the Berkshire is superior, in our opinion, (editor) to any other breed we have seen, but this is only *our* opinion. For thrift we deem them equal to any, and for hardness inferior to none. We have bred all the popular breeds but the Russian and the Irish, (which we

propose yet to try) and so far as our own preferences are fixed, we prefer the Berkshire for family pork, and for slaughtering and packing, but the Woburn or Bedford for *traveling*."

It is indeed true that the power of enduring travel with the least possible waste of flesh, is an object of the utmost importance to those who are raising hogs to be driven to a distant market; and various considerations present themselves to one endeavoring to ascertain the comparative value of different breeds. The condition of the farmer, his means of raising stock, whether circumscribed or extensive, and its ultimate destination for home consumption or foreign markets, are all matters connected intimately with the estimates of different individuals. Experience has demonstrated that hogs of fine bone are most suitable for slaughtering, for pork and bacon, while those of coarse bone and long limbs are least affected by continued traveling. On the power of enduring travel, belonging to the Berkshire breed, the following communication from A. B. Allen, Esq., of Buffalo, one of the most distinguished and indefatigable improvers of stock in the whole country, will be found at once instructive and amusing.* "I should also add to his other good qualifications that the Berkshire carries much more muscle in his meat than other races; is consequently leaner and therefore more desirable, and when butchered at a proper age is very succulent and tender. I have also found the offal of these superior breeds much lighter in proportion than the common hog, which again adds greatly to

* Vide Franklin Farmer, vol. 3, No. 2, page 12.

their value. Possessing as the Berkshire does so many good qualities in so great perfection, together with his high weights, no wonder he has become so immensely popular in the south and west. And I pronounce him of all others the best adapted, in my humble opinion, to that part of our country.

“ We now come to a more serious objection to the improved breeds which seems to have immediately taken possession of the minds of many at first sight of their thick solid flesh and fine bones, but which I hope to show has been hastily adopted and without making fair experiment of their powers on this necessary point. In many parts of the country the farmer cannot kill his hogs at home because he is so far inland that the cost of transportation of the pork would equal its value when arrived in market—he is therefore under the necessity of driving them some three or five hundred miles before butchering. Well, then! inasmuch as the Berkshire’s legs are not as long as a cranes, his nose like a pick ax, and his back sharp enough to saw a white oak rail in two at a single pass, he cannot thus be driven. But gentle reader, did you ever try him? If not, myself and others in this vicinity have, and were we sporting men, would gladly back a promiscuous drove of Berkshire shoats for one hundred miles or any distance above that, against any stilted legs the country could produce. For a few miles the stilts if put to it, I grant would beat, but for a hundred or more, though carrying little else than hair, rind, gristle, offal and bone, they would be found in the rear. And why should not the Berkshire

drive? Look at him as he stands with outstretched length and head erect, and notwithstanding his great tendency to fatten he has something of the noble blood horse shape and conformation, which to a Kentuckian makes it easier to understand the wherefore of his good traveling points.

“There is the full, deep, powerful chest that gives his heart and lungs room to play and constitutes his wind. There is the thick, strong, elastic muscle, there are the fine, hard ivory bones, and there is the proud indomitable aristocracy of spirit that, when called upon in the contest, gives him the will to strive and the power to come off victorious. I have witnessed many a battle between the Berkshire and the common hogs when herding together, and though the former was often much the smallest, he almost invariably flogged his opponent by real bull dog endurance. I will also give another example. I once purchased a lot of about fifty head of Berkshires consisting from the pig of a fortnight old to the heavy sow of at least three moths gone in pig. It was mid-summer, the weather excessively hot, and though the way was but a continued up hill and down, over a gravelly and stony road, they accomplished it, fifty miles in five days, without the slightest accident; not a single lagger, and without showing fatigue. Thus, at the rate of ten miles per day, which I understand is about the average of driving the common hog on the softer and more level roads at the south and west, making a course that is at least two or

three miles a day in their favor. In fine, this is a matter which the breeders of Berkshires will not so easily concede, and though the requisite with them is *pork*, not *speed*, still I should not be surprised to read in the spirited pages of the Franklin Farmer, within three months, a regular challenge to drive dark Berkshires against white long legs, streaked or blue, for a pair of good pork hams a side, half forfeit or half pay on a hundred mile course, loss or gain of flesh to be considered as making or losing distance during the performance, coupled with an offer to give something in the start."

In a letter from the same source, addressed to Hon. H. L. Ellsworth, from which we are kindly permitted to make extracts, we find the following:—"You will probably, sir, have noticed from my advertisement that I have *two distinct* breeds of hogs, the Berkshire and the improved China. The former if well attended to, easily weigh 600 pounds at eighteen months. Several of the progenitors of mine have overgone this weight. Sir William Curtis, with whom I had the pleasure of an interview at St. Petersburg, bred one to the enormous weight of 903 lbs., but such hogs are necessarily coarse, *which is a great fault with animals of any kind*, in the eye of a refined and experienced breeder. I must say, that my own taste will not lead me beyond 400 pounds, but to suit western gentlemen as a general rule I am breeding to about 500 and 600 pounds. This breed is celebrated for the great quantity of *fat-lean* in their meat, are long in the body, making a

large proportion of side pork, and yield large hams abounding in delicate lean, a great consideration with amateurs. They are undoubtedly the best race of hogs, kept pure, that can possibly be found for the rich corn lands of the west, and the boars will produce a marked and rapid improvement, crossed with the common hog of this country.

A writer in the *Genesee Farmer*, vol. 9, No. 37, p. 284, in speaking of the numerous breeds of the domestic hog existing in the United States, thus continues—"At the head of these varieties, whether for crossing or feeding, stands the **BERKSHIRE**, a breed which, if it is of comparatively recent introduction, has by its valuable qualities proved itself worthy of a more rapid dissemination than any other breed has ever received in this country. That the Berkshire pig is in equal favor abroad where he is best known is evident from the following extract which we make from that standard work, *British Husbandry*, and which will also exhibit the principal characteristics of the animal. 'The Berkshire hog is of a reddish-brown color with black spots,* the head well placed with large ears generally standing forward, though sometimes hanging over the eyes. He is short legged, small boned, of a rough curly coat,

* Some objections have occasionally been made as to the predominance of black in the Berkshire of this country. This was accidentally the color of the first importation made by Mr. Hawes. Many of the animals in a more recent selection made by Mr. Hawes for J. Lossing, Esq. have a tolerable admixture of white and black.

wearing the appearance of both skin and flesh being of a coarse quality. Nothing, however, is finer than the bacon, (or pork,) and the animals attain to a very large size, having not uncommonly reached the weight of more than 100 stone, but from forty to fifty when completely fatted is the general average. This breed has indeed obtained such general approbation from the best judges that those who wish to improve their stock of swine are very generally desirous of obtaining a cross with this race, and they are consequently dispersed over the most distant parts of the country. Some of the best of these crosses are found in Staffordshire, from the progeny of an animal well known to the breeders as the 'Tamworth Boar.' The native breed is also usually crossed at intervals either with the pure Chinese or Tonquin race, and the process is found necessary to prevent deterioration."

(THE CHINA HOG. This animal is thus described by Pennant, one of the early naturalists, in his *Hist. of Quadrupeds*, p. 142. "Belly hanging almost to the ground, legs short, tail very short, the body generally bare, (as is the case in general with the swine in India.) Its wild breed is found in great numbers in New Guinea and in the islands of that country, which the Papuas chase in their canoes as the animals are swimming from island to island, and kill them with lances or shoot them with arrows. They are also found on the island of Gilolo, and resort eagerly to the places where sago trees have lately been cut down, to feed on the pith left there, which makes them very

fat. The priests say they came originally from an island which they call 'The Mother of Islands.' They are the animals which are sacrificed to the lesser deities of the Isles; are roasted whole, placed on altars and there left to decay." * (It is to an admixture with this breed that we owe very many of those fine varieties to be found both in Europe and this country; and indeed to no other race are European agriculturists more indebted than to this, for the great change in the characteristics of the native breed. Of the Chinese hog, there are distinct varieties, the White and the Black. Both are small boned and thin skinned, and covered with fine bristles, and may generally be fattened to the weight of sixteen stone at two years old. The pure breed is little cultivated in this country. They are generally difficult to rear, and the sows not unfrequently prove bad nurses to their offspring. We are informed also,† of "a mixed breed of this kind, being white varicously patched with black, some of which have prick ears like the true breed, which they otherwise resemble, and others have the ears round at the ends and hanging downwards. These last are in every respect coarser than the former; but they are remarkably prolific, are good nurses and with proper care will bring up two litters within the year. They are, however, only valuable as breeding sows and roasters, for they are very

* For farther information consult Lin. System, art. Sus Chinensis, p. 101—also Forrest's Voyages, tab. 2. p. 97.

† Vide Farmer's Cabinet, vol. 2. p. 285.

indifferent store pigs, rarely attaining any great weight."

An *Improved* breed of these animals is now in the possession of A. B. Allen, Esq. of Buffalo, who thus writes in regard to to them. "The Improved China is a real improvement on the original stock. They (the original) being too tender for our climate and too gross in their meat for general eating.

"It has been a long process improving them, begun in England and much added to in this country, as my friends flatter me, by myself. Many hogs are called China that are but diminutive grass breed, or coarse lop-eared Byfield. We have plenty of both in the neighborhood, and it would afford me great pleasure to show the contrast between them and my China, but I must now confine myself to merely saying that they are the easiest kept animal of the hog kind in the world, and will return *the most pork* for the same amount of food, of any known breed. Their meat is fuller than the Berkshire, and even *more delicate*, tasting when boiled and left cold, more like sweet fresh butter than any thing else I can liken it to. I have animals now in my yard, that if fatted would weigh 400 pounds, but 200 pounds would be a good weight at 18 months; and boars of this kind crossed with common sows, owing to their extreme firmness of limb, depth and breadth of carcass, will produce a more rapid improvement than any other.

THE BEDFORD OR WOBURN HOG. The Woburn is a variety introduced by the Duke of

Bedford, one of the most distinguished stock breeders of modern times. They were first sent to this country as a present from the Duke to Gen. Washington, whom they never reached, owing to their detention and sale by the person to whose care they were committed. They are favorably known throughout the country and their crosses constitute some of the most valuable varieties. Thomas G. Fessenden, Esq. in his excellent remarks on swine,* furnishes the following communication from O. Fiske, Esq., an able and judicious cultivator. "My hogs are of the Bedford breed, so called in England, and experience has proved to my satisfaction, that this breed is far the best which has been introduced into this country. They are quiet in their nature, fat, easy, and with little expense or trouble I have had some weigh at twelve months old about three hundred forty pounds, and a considerable number of eighteen months old, four hundred pounds." Another strong testimonial of the excellence of this breed is found in the following extract of a letter from the Hon. Levi Lincoln, late governor of Massachusetts and president of the Worcester Agricultural Society, to the Hon. Oliver Fiske:—"I have great pleasure in voluntarily offering myself as your compurgator in the representations with which you have recently favored the public, of the Bedford breed of swine. The care and perseverance which have marked your attention to the prospects and

*Vide Farmer's Library, vol. 3. The Complete Farmer by T. G. Fessenden, 3d edit. p. 155 and 165.

value of these animals, and the success which has followed your exertions to introduce them to the favor of *practical* farmers, require at least an acknowledgment from all those who have been particularly benefited by your liberality, and from no one more than myself. This breed of swine has taken the place of a long-nosed, flat-sided, thriftless race, called by some the *Irish* breed, by others the *Russian*, which would barely pay by their weight for ordinary keeping, and never for one half the expense of fattening, if indeed grain would make them fat. I have had three pigs butchered from the same litter, precisely seven and a half months old. Their weights when dressed, were two hundred and thirty, two hundred and thirty-five, and two hundred and thirty-eight and a half pounds. One sold in Boston for six and one fourth cents per pound; the others were put up here for family use. The expense of fattening these pigs was less than with any other breed I ever raised, and the proportion of bone and offal to valuable parts was surprisingly small. I have fifteen more on my farm, part designed for the market in the spring and part to be kept over as store swine, and their appearance will furnish ocular satisfaction of the propriety of all that has been said in favor of this breed."

THE MACKAY HOG. This breed was introduced into the United States by Capt. John Mackay, of Boston, and those offered by him have repeatedly received premiums from the Agricultural Society of Massachusetts. This

variety has for a long while been most widely scattered and generally esteemed, in the north-eastern portion of New England. An extract of a letter addressed to the Hon. Henry L. Ellsworth by Elias Phinney, Esq., of Massachusetts, is as follows:—"To your inquiry as to what breed of hogs I prefer, I will state, a cross of the Berkshire with the Mackay, which are my principal breeds. With the history of the Berkshire pig you are no doubt acquainted. The Mackay pigs were imported into this country from England about fifteen years since, by Capt. Mackay, of Boston, from whom they derive their name, and till within a few years were decidedly the best breed in New England, and perhaps in America. But in consequence of breeding '*in-and-in*,' as it is termed, they had greatly degenerated, had become weak and feeble in constitution, small in size, ill shaped, and in many instances deformed. When first imported, Capt. Mackay, on his farm at Boston, not unfrequently brought them up to 600 lbs., at the age of eighteen months. In all the essential points, they greatly exceeded the Berkshire, particularly in lightness of offal, greater weight of the more valuable parts, firmness and delicacy of limb, thinness of skin, roundness of body, &c., but withal a hog of feeble constitution. With a view of restoring some of the good qualities of this breed and uniting them with the healthy constitution of others, I tried various crosses without much success. One of those which did pretty well, was with the Moco, so called,

which I obtained from the Genesee county, in the state of New York. But decidedly the most fortunate cross is with the Berkshire, which I obtained from my friend Mr. Bement, of Albany, about three years since. The produce of this cross is a breed which far exceeds those of any other, possessing all the good and useful qualities of the Mackay, united to the vigor, size, and health, without the coarseness of the Berkshire. The best pigs, however, that I have ever raised, were by putting a full blooded Berkshire boar to a sow, which was a cross of the Mackay with the Moco—the produce being half Berkshire, a quarter Mackay, and a quarter Moco.

THE RUSSIAN HOG. For the following description of this animal, we are indebted to a letter from James E. Letton, Esq., of Kentucky, published in the *Franklin Farmer*, vol. ii. p. 404. “Their color is generally white, with long coarse hair, their head is long and coarsely featured, their ears are not so broad as the common variety of the country, yet longer and narrower, and come regularly to a point, projecting forward, and they do not appear to have so much command of them as other breeds. They have fine length and height, their bone is large and fine, they stand well upon their pastern joints, and are good trackers; quite industrious. They are thick through the shoulders, indifferently ribbed or suddenly inclined down, their plate or kidney bone rather narrow and ovaling than otherwise, hams pretty good, though not so good as the Berkshire or the

Irish Grazier, yet preferable to the variety. They do not graze so well as many others, they want more time to bring them into market than the above named breeds. Give them from eighteen to twenty months' age and they will make very large hogs. They are quite prolific, their usual number is from nine to twelve pigs a litter. I have found their cross with the named breeds to be a valuable acquisition, combining aptitude to fatten and rapid growth at the same time.

THE LEICESTERSHIRE HOG, enters largely into some of the most valuable crosses in England and this country. The original stock were large, of great depth of body, flat-sided, and covered with light spots, and somewhat distinguished for a well turned head and ear. A cross of the Leicestershire boar with the Devonshire stock, produced a breed of great breadth of chest, plumpness of frame and depth of body, with fine bones and small limbs, and possessing aptitude to fatten easily. Another cross of the Leicestershire with the Chinese, has reduced the size of the former, but given rise to a breed of no small profit to the farmer, easily kept and fattened to the weight of from 350 to 400 lbs. at eighteen months.

THE IRISH GRAZIER HOG. Several recent crosses of this animal with the full blooded Berkshire, have produced an excellent breed, esteemed in many portions of the western country. For more particular description, the reader is referred to the contents and plate of the Franklin Farmer, as to this variety.

THE GRASS BREED HOG. This breed is celebrated for its great aptitude to fatten, and an excellent variety known as the Litchfield Grass Breed, may be found scattered throughout Connecticut. A cross of this variety with the Leicestershire has produced an uncommonly fine breed of a pure white color, long and square frame, and considering the size, remarkably well limbed. This last mentioned variety is termed the *Rose* breed, from being generally marked on the back with a light colored star or blaze, about four inches from the tail.

Late importations of the HAMPSHIRE AND ESSEX HALF BLACK HOGS, and the recent introduction of the Neapolitan, will, if these varieties are properly managed and judiciously crossed, secure many valuable additions to our present stock. Other crosses of greater or less merit, unknown to the present writer, are doubtless scattered throughout our country, though the foregoing list will probably be found to include the best known and most important varieties. A spirit of experiment and inquiry on this subject has been aroused extensively in the minds of agriculturists, which will doubtless eventuate in the rapid improvement of the domestic hog in this country. As the stock we now have is amended or increased by crosses, or the introduction of new breeds, it is to be hoped that the pedigree of each distinguished variety, may be preserved with that minuteness which shall enable the future investigator of any species to assign correctly the parent stock from which it has originated.

CHAPTER II.

Comparative influence of male and female in impressing their descendants—Modes of improving stock—Rules for selecting breeds—Crossing—Breeding in-and-in—Class of points for hogs—Cooper's two rules for breeders—Times of copulation—Apportioning the litters of the sow—Treatment of young pigs—Tendency of sows to destroy their offspring—The operation of spaying described—Substitutes for spaying—Method of obtaining the weight of swine while living.

MUCH discussion has of late been excited, and many able dissertations written, on the comparative influence of male and female parents in impressing peculiar characteristics on their descendants. It was the opinion of Sir John Sebright—and his testimony is often quoted by those who advocate the same position—that “there are no means by which the breed of animals can be so rapidly and effectually improved, as by its being the particular business of some breeders to provide MALE *animals* for the purpose of letting to hire.” Such was deemed the importance of this matter, that the Highland Society, of Scotland, proposed for discussion and awarded prizes on the question, “Whether the breed of live stock, connected with agriculture, be susceptible of the greatest improvement from qualities conspicuous in the male, or from those in the female?” Those who have advocated the claims of the first sex mentioned, have relied on the greater number of distinguished high bred males to be found in almost every country, and the ex-

traordinary impressions of the sire on his descendants in crosses with inferior native stocks. The certain transmission of the *color* of the thorough-bred stallion throughout his progeny, often effecting in comparatively short periods important changes in this respect, in the breeds of a large district, and the marked impressions of the male as to *form*, in the ox, and still more particularly in sheep, have been repeatedly noticed and advanced. Many interesting experiments on the tendency of the sex alluded to, have been collected and made known.*

By the opponents of the doctrine, on the other hand, the existence of any independent sexual ability, in either male or female, to impress their offspring, is most strenuously denied. They contend that the confessed importance of such an inherent propensity, provided it could be established, occasioned from the first wishes and conjectures, which gradually assumed the form of *belief in its existence*; and that a doctrine thus feebly based, found, unfortunately, strong support in the ready reception which it met with, and was generally accredited. They contend further, that the natural consequence of attention to the breeds of stock would lead to the production of an improved and *numerous* race of MALES, which would be generally sought for in preference to females, from the

* One of the most interesting, as connected with the subject of these pages, is the result attending the intercourse of a pure Bedford Boar with a thorough bred sow, which our readers will find in the Essay of John Boswell, Esq., contained in the Transactions of the Highland Society, of Scotland.

fact that the services of the former might be commanded to a great extent, while those of the latter would be restricted to perhaps a single produce in a year,—that the introduction of males, thus selected for superior characteristics, and obtained by a long course of breeding from animals possessing important requisitions, to the *common* and *inferior stocks* possessing no *determinate* character in regard to their descent, would doubtless be attended with astonishing results, and that the same would be the case in regard to the progeny of a high bred female and inferior male. They also declare, that where the system of crossing is judiciously pursued and both parents are *equally well bred*, great uniformity in their descendants will appear, and a total absence exist of those strong impressions which excite surprise when but one parent claims superiority. In their own language, we are called on all “to contrast this state of things with that which would be apparent in the inferior stock, to improve which the well bred bull is put in requisition. There it is that the produce astonishes, for the sire impresses characteristics peculiarly his own. If it be inquired why it is so, the answer is easy, for the reason is obvious. His excellences are the accumulated acquisition of many ancestors; they are positive and comparatively fixed, while the cows, with which he has been used, possess little or no character, and have been bred without regard to any point but the production of animals to increase the stock upon the farm.” It would well repay

the expenditure of time to pursue this interesting investigation of sexual physiology, but we leave it for the consideration of more practical portions of our subject.

The farmer who wishes to effect an improvement of his stock will do so, either by the immediate and entire removal of existing breeds, and the substitution of others in their room; or by selecting the best individuals of the variety he has on hand, and improving them in this way for successive years; or, lastly, by crosses with a superior male of some different breed.

The first method proposed is liable to objections, on account of the expenditures which it involves, and the probable difficulty of obtaining a suitable number of females of the improved stock from which it is proposed to breed.

The adoption of the second mode must be determined from the fact, whether the existing stock is adapted to the nature of the farm, together with the circumstances of the cultivator and his mode of cultivation.

The third mode is that from which the judicious breeder of stock will derive the most advantage, and which of course he will most naturally adopt. To aid him in so doing, we annex the following valuable hints on the improvement of inferior breeds by crossing, from the excellent "Elements of Practical Agriculture," by Mr. Low. "This method has often led to disappointment from the nature of the crosses attempted, especially where the crosses have been violent, as between animals of very

different character. The first cross will in general be good, but in breeding from the progeny of the cross, expectation will often be disappointed. Nor do the good qualities of the first cross always remain in the progeny, but often there are found in it defects which cannot be traced to the parents.

“This, however, generally comes from injudicious crosses, and from unacquaintance with the principle on which the crosses of different animals should be conducted. When a cross is made, it should be with a male of a superior breed, and in this case the first cross will be almost always a good animal. To secure the full benefits of the cross, however, *we should not too hastily resort to the males of the inferior stock*, because it might be found that while we had injured the original breed, we had not substituted a better in its stead. *The general rule, therefore, should be, to cover again the first cross with a superior male of the same breed, and so on, until the good character of that breed becomes permanent in the progeny.* This is said to be breeding up to the parent stock.

“There are, indeed, numerous cases in which a single mixture of better blood will do good, as with those inferior breeds which have no fixed characters. These will be improved by even the slightest admixture with the blood of a better race; and a farmer who is in a district where this class of animals prevails, may safely avail himself of a good male, in the same manner as a breeder of horses would do, although the stallion were of a different character from

the native stock. The cases where crossing is to be attempted with caution, are when a breed of established good characters, or of characters which fit it for the nature of the country, and the state of its agriculture, already exists.

“Now we might breed from animals nearly allied to one another in blood, as brothers and sisters, parents and their offspring, technically called ‘breeding in-and-in,’ or from animals of different families. By the latter method are produced animals more hardy and less subject to disease; by the former we are frequently enabled to produce animals of more delicate form, and greater fattening properties, and above all to give a greater permanence to the characters of the parents in the offspring. The first improvers, indeed, found the practice to be, to a certain extent, necessary, because they could not resort to the males of other families without employing inferior animals, and so impairing the properties of their own breed.

“It is to be observed, that the breeding and continuing to breed from animals very near of blood, produces animals which have a greater tendency to arrive at maturity and to become fat. This seems to result from a tendency to premature age in the animal, which thus more quickly arrives at maturity, of bone and muscle, and so begins sooner to secrete fat.

“The system, however, of breeding from animals near of blood has its limits. Nature will not be forced too fast for our purposes. It is known that although the joining of animals closely allied diminishes the size of the bone

and gives a tendency to fatten in the progeny, it renders them also more delicate and subject to diseases. Although, then, this near breeding may be carried to a limited extent, between very fine animals, for the purpose of rendering their qualities permanent in the offspring, we do a violence to nature when we carry it too far. The progeny, along with their maturity and aptitude to fatten, become feeble, and the males lose their masculine character, and become incapable of propagating their race.

When, therefore, the stock of any farmer has become too nearly allied, he ought not to fail to change his males, and procure the best of the same breed. This is essential to preserve the health of the stock for any time. Great losses have been sustained by breeders who have carried the system of close breeding too far, with the design of pushing the improvement of their breeds to its limits.*

A common error has existed in this country, in regard to swine, which has led to selection of breeds with reference to great size and weight, rather than to other good points, and especially the amount of valuable meat they can be made to carry. The flesh of smaller breeds is in general far more delicate and better flavored than that of large ones, while the proportional expenditure of each is the same. "It was lately remarked," says N. C. Bement, Esq., in his Report from the Committee on Swine, "by

* Vide Low's Elements of Practical Agriculture, London edition, 1838, pp. 514—517.

an eminent breeder of England, Mr. Gray, at an agricultural dinner, that he could feed on an acre of land, a greater number of pounds in mutton, in carcasses from 18 to 20 lbs. per quarter than in carcasses from 28 to 30 lbs. per quarter, and that a quarter of mutton from a sheep of 18 to 20 lbs. weight per quarter, is worth more in proportion than from a sheep of 30 lbs. per quarter, and that consequently the advantage is on the side of the smaller carcasses. And he assigned this among other reasons, that in case of drought or scarcity, a small animal can collect as much food as a larger one, and having a smaller carcass, it derives more advantage from it; that whilst the larger is losing in condition, the smaller one, if not improving, is remaining stationary, and when the period arrives at which an abundance of food can be obtained, it almost immediately reassumes its position, and is fit to go to market sooner than the larger animal." "These remarks are found to hold good in regard to swine as well as sheep. The same quantum of food that will give 600 pounds to hogs of a very large breed, will fatten two hogs of 300 pounds each, and the meat of the latter though not so fat will be of the better quality."

With many breeders, the sole consideration seems to be, the obtaining of a breed, possessing aptitude to mature and fatten *speedily*. That these are points of great importance, no one would deny. Yet it should be remembered that it is not alone the *quantity* but the *kind*

of fat which is desirable, and that those breeds are most desirable, in which this end can be accomplished with the greatest economy of food.

Long and careful observation has furnished rules by which the judicious breeder can determine with great accuracy the value of live stock, and which apply equally well to the growing and matured stage of various animals. It is found, for example, "that the nearer the section of the carcass of a fat ox, taken longitudinally vertical, transversely vertical and horizontally approaches to the figure of parallelogram, the greater quantity of flesh will it carry in the same measurement." The result of numerous and long continued investigations on the points of cattle, have been brought together and form an almost perfect science by which to try the merits of that animal,—comprising purity of breed; particular form of the carcass; prominence and clearness of the eye; state of the skin; hardness of flesh and its position on the carcass, together with the proportion of the extremities of the body, to the whole body and to one another. Similar rules as to important characteristics of sheep and swine are given, in reference to which latter animal experience seems to have assigned the following

CLASS OF POINTS FOR HOGS.

1. Purity of breed, possessing aptitude to mature and fatten readily on little food.
2. Head small and short, and sprightly;

chest deep and broad; ribs arched; neck short and thick, well set with bristles; limbs small and fine boned; bristles soft resembling hair; ears, in general, erect and small; legs short and quarters full; skin soft and elastic.

3. Carcass round, full and compact, possessing lateral extension and proportional length.

A. B. Allen, Esq., in a communication to the Franklin Farmer, writes as follows:—"I have ever remarked that a hog that fattens kindly, possesses a deep, wide chest, which causes great thickness through the shoulders, and that the reverse points constitutes the animal that it is utterly impossible to put flesh upon; in selecting fatteners, therefore, my eye is first set there. That point being satisfactorily settled, I turn to the hams, and as this is the most valuable part of the meat they cannot be too thick. We next examine the barrel, and the thicker, deeper and longer that is, the more side pork, which after the hams and shoulders is the next in request; but in seeking length great care should be had to avoid hollow backs which in a young animal is unpardonable. We have now the essentials; then follows the utmost possible fineness of head, ear and tail, thin hair and rind, and legs as small as can hold up their great superstructure, the body. If the meat then be fine grained, with a proper intermixture of fat and lean, and well flavored, we have now the perfect hog—an animal that keeps quiet, feeds kindly, and comes to

early or later maturity, as best suits the interest of the owner.

In report of the committee on swine,* we find the following observations:—"As regards the choice of hogs for breeding, it is recommended that the male should be small headed, deep and broad in the chest, the chine rather arched, the ribs and barrel well rounded, and the hams falling full down nearly to the neck; he should also be more compact in his form, and rather smaller than the female, for if she be coarse, her progeny will be improved in form by the cross, and the more roomy she is the better chance will she afford of producing a large litter. Respecting her make, no other observation need be made, than to choose her of a deep and capacious body with a good appearance, and belonging to as good a race as can be found."

The sow, according to the Complete Farmer, p. 155, "should be selected with great care, broad and straight back, wide hip, a great many teats, short leg and fine bone."

The two following rules of Cooper, are worthy the attention of all breeders:—

"I. Choose those animals or vegetables to propagate from that possess the qualities you wish to propagate, in the greatest profusion. Volumes may be written to illustrate and confirm this advice, but nothing can add to it substantially.

"II. Never quit one good breed till you can

* Cultivator, Vol. 6, No. 1. p. 31.

pick out from a better. By following this plain method for a few generations, always seeking for those parents who have the points you want, in the greatest perfection, will you certainly improve your stock, whether of racers, cart horses, cows, corn, or strawberries."

Another consideration of no small importance is the proper time of admitting the boar to the sow, with reference to his age, and the most economical distribution of his services, as well as the apportioning of the litter of the female to suitable periods of the year. And in advance of the subject, it may be proper here to mention a fact which in practice is too often disregarded—that *a single intercourse is generally sufficient for successful impregnation.* Ignorance of, or inattention to, this fact, joined to the desire of too rapid an increase of stocks, has often led the disappointed farmer to distrust the qualities of the animal employed, and rendered him disheartened as to future efforts. The procreative power, like every other conferred by nature, may be gradually weakened, and finally destroyed by unrestrained indulgence. On this point, there is little fear of exercising too much caution. Intercourse at too early an age or too often repeated, has impaired and finally exhausted the power of many a fine boar, and in the place of a sound, healthy breed, left upon the hands of the farmer a deteriorated and effeminate progeny. It should therefore be continually kept in mind, *that nothing is more dangerous to the success of the breeder, and the production of a healthy*

issue, than the permission of unrestrained indulgence on the part of the male animals he has selected.

In connection with this point, will naturally be considered the apportioning of the litters of the sow to the most suitable periods of the year, both in regard to the comfort and the convenience of the farmer; and also the proper mode of treating the young pigs during the first weeks of their existence. Ample information on these subjects will we trust be found in the contents of the following pages which we have collected from various sources of allowed authority. An able writer in Reese's Encyclopædia, remarks:—
“It has likewise been suggested that the best stock may be expected from the boar at the full growth, but not more than from three to five years old, and that no sows should be kept open for breeding, except such as have large, capacious bellies. Being well fed from the teat, the sow will procreate at seven months; *and if she be of the kind in which the strong tendency to fat increases the risk of bringing forth, probably the suffering her to breed as early and as quickly as possible, may contribute to amend the defect.* It is also hinted, that if a sow of this description would admit the boar the third or within a few days of pigging, imposing on her the severe task of constant breeding and suckling, this would doubtless keep her sufficiently lean and roomy for the production of a litter. It is probable, however, that the quality and size of the pigs would suffer. But some suppose it better to defer the sow's taking the boar

until *ten or twelve months old*, as she becomes more strong and affords better litters of pigs; and that the boar should always be a *year old*, or more, before he be put to sows, as by this delay he attains more growth and is more vigorous. It may be remarked with respect to being with young, that in the sow it is about four months, and the usual produce is from eight to ten or twelve pigs in the large, but more in the small breeds, which in general bring the greatest number and the most early." Says Loudon*:—"The best times for copulation are November and May, because then the progeny are brought forth in mild weather, when green food is to be had. They should not be allowed to farrow in winter, for young pigs are exceedingly tender and can with difficulty be preserved in very cold weather, nor at a time when food is scarce, as is generally the case upon our farms in summer, if the stock of them is large. When the object is suckled pigs, for the shambles, copulation should be so continued as to produce parturition at all seasons. Twenty swine are estimated to bring at an average seven pigs and a half for their first litter; but the number varies much, and many young pigs are lost soon after their birth by the unkindness of their dam, and by casualties to which they are more exposed than most other animals. A breeding sow ought to have a large, capacious belly, and *not to be too much inclined to obesity*. To check this tendency, allow them to breed

* Vide Loudon's Encyclopedia of Agriculture.

five times in two years. The age of the boar should not be less than a year, as he will then be at his full growth; nor that of the female less than ten months." A. B. Allen, Esq., in a communication to the Franklin Farmer,* remarks:—"A boar should never be permitted to be used until seven months old at least, and it would be much better that he were allowed to run till nine months. But if commencing at seven months, he should cover sparingly, say not more than fifteen or twenty sows till a year old, and these as distant apart as possible; one or two only in a single week. From this time until he has obtained pretty full vigor, which I should place at about eighteen months, he may be bred from a little more freely. His spring seasons might then vary from twenty-five to thirty sows, and his fall nearly double this number. In the mean while he should be kept with care. A strong door may open from his pen into another to which the sow is introduced; he is then let in and allowed *one* coitus only, immediately after which he must be turned back and the sow taken away. It has generally been noted that *one covering* produces a more numerous and stronger offspring than two or three, and that *ad libitum* service is alike pernicious to all parties.

"The best food for the boar during the season is boiled or soaked corn, with plenty of pure fresh water, and, for variety, some swill from the house with meat in it, and a raw or boiled veg-

* Vol. 3, No. 5, p. 36.

etable root or two; and as an antidote to disease and to give tone to the appetite, and assist digestion, a table spoonful or so of sulphur is occasionally put in his food. Salt is also placed where he can get at it when he pleases, and charcoal or small chunks of rotten wood together with a handful of crushed bones is thrown to him, if convenient. He must be kept alone in his sty under close cover, with a small plank floor, and plenty of dry litter, the sleeping apartments connected with a good yard to exercise and root and wallow in, and a strong post placed upright near the centre for him to rub against. During the interval between the spring and fall seasons, it would be greatly conducive to the health, vigor and longevity of the boar, if he could have run in a cool grass pasture, with clear sweet water passing through it, and take lighter food than when in service, but yet sufficiently nutritious to keep him in fair store. A good animal thus treated, may last ten to twelve years, and get excellent stock from first to last. But care must be taken that he be not *over worked*; this is deemed very essential. It will be admitted, however, that individual males will serve a greater number than that limited above; but my principle is, *not to work them up to their full capacity*; if error must be committed, it is better that it be on the safe side.

“Unless a sow was very coarse and the object be to fatten her, I would not allow her to breed till eighteen months old, and if something extra was desired, she ought not to come in under two years; there is then no check of growth,

and her first litter is usually as good as any subsequent one. She ought to be taken up and occupy a place alone, either in a pasture or a pen, similar to that described for the boar, one month previous to farrowing, her condition kept good, and steadily watched when expected to bring forth.

The same author, in a letter addressed to the Hon. H. L. Ellsworth, observes:—"I do not know how many sows a boar might effectually serve in a season. It will depend something on the breed—a Berkshire being more effective than a China—something on the animal, but more on his food and care during service. For instance, a single coitus of one of my sows last fall has this spring brought a noble litter of thirteen pigs, *when the same sow served by the same boar a year ago ad libitum*, only brought nine last summer; so that, judging from this, enough was wasted on her alone a year since, to produce a half dozen conceptions. I think *three* services abundant in any case, and I should not wish my boars *in their prime*, to serve more than five sows in a single week, or fifteen in one month, or forty-five in four months; still, less or more, according to judgment should be done. As a general rule, however, bulls and boars of high repute are sadly overworked, and thus the great disappointment in their stock. The best breeders for the turf in England, limit their stallions to twenty or at most thirty mares; hence one great certainty of the vigor of their stock, and the probability that the son will add to the reputation of the sire."

A recent French writer of distinction,* on the subject of generation, remarks, that among females who receive the males *only once*, those who receive him *first* produce generally more males than females. In proof of which, the author (among other instances of similar import) mentions the following:—"A boar was admitted on the same day to two sows of two years old, of the same strength and same litter. *The first produced nine males and a female, the second, nine females and one male.* A young boar of five months was afterwards admitted to two sows of the same litter as the boar. The first produced five males and two females, and the other (four hours later,) six females and two males."

In the Elements of Practical Agriculture will be found the following information on the subject:—"The sow goes with young 112 days. She is fit to receive the male in the first year of her age, and the latter is able to propagate his species at the same early period, but he should be twelve months old before he is admitted to the female. The female produces from five to ten or more at a birth, and she can easily be made to produce and rear two litters a year, and she may even rear five in two years. She is ready to receive the male soon after the birth of her young, but the time should be chosen which allows her to produce her litter at the most convenient season. Thus, if she is to be made to litter twice in one year, the first should

* Giron sur la reproduction des animaux domestiques.—*Annales des Sciences Naturelles*, Mai, 1830.

if possible be produced about the beginning of February, and the second about the beginning of August, so that the last litter may gain full strength before the arrival of cold weather.

"The time when she is about to produce her litter, will be known by her carrying straw in her mouth to make her bed. Before this, however, she should have been separated from her fellows and carefully littered. The straw should be short and not in too great quantity, lest the pigs nestling beneath it, unperceived by the dam, be crushed by her when she lies down.

"During the period of nursing, the dam and the young, should be lodged dry and warm. They should be fed three times in the day with whey, milk, and a little water slightly warm mixed with bran, meal or any farinaceous substance, and when the pigs are in the course of feeding from the troughs, the mother may be allowed to go at large for an hour or two. In six weeks, if they are well fed, the pigs may be weaned; but should they not have been well fed, eight weeks will be required. When weaned, they are to be fed three times a day with wheat bran, barley dust, or on farinaceous food mixed with water warmed to the temperature of the mother's milk, and with whey or other refuse of the dairy or kitchen. In a few weeks they will begin to eat potatoes, turnips, and all other sorts of food."

In an ancient and very curious work, originally written in French, entitled, "*Maison Rustique*," and by the English translator rendered, "*The Country Farm*," we find the fol-

lowing quaint observations :—" Keep not about ten boares for a hundred sows and so forth proportionably ; the rest, as well male as females, let them be wained and gelded after a yeere old or sixe months at least ; howbeit, the infallible time and opportunitie is when they begin to grow hot and go a brimming. Let not your gylt go to bore till she be past a yeere old, and let the boare be between three and fower, for after he be past five he must be gelded to be fatted. You must also beware that the boare keep not companie with the sowes that are with pig, for he would but tear them and leave them to cast their pigges."

The correspondence of James E. Letton, Esq., describing the practice he has adopted in reference to these subjects, contain so much of valuable information, that notwithstanding its length we are induced to place the greater portion of it before our readers. Commencing with the rearing, breeding, and treatment of thorough bred male hogs, he remarks : " To insure good size, firm and fulness in their hams, straightness in their stiffe joints, and to give a good and regular growth, I seldom or ever suffer my boar to serve a sow until he has arrived to the age of ten or twelve months, and older if possible. I give them a lot sufficiently large for exercise, and give food enough to keep them in a high state of flesh while growing ; by so doing, I have no fear, from past experience of injuring their libidinous propensities, as so much objected to by many aged men, who pretend to be hog growers in Kentucky.

By this mode I am satisfied you will have stronger, more vigorous, active and regular sized pigs to every litter; and, furthermore, you will find your sows on littering are not so apt to produce pigs dead, fitty and feeble, as when got by young or poor boars.

“Sows are susceptible of conceiving when four or five months old, but far better at a later period. I would recommend not to breed then, until about eight months old, that their first littering will be when they are about twelve months of age. Sows impregnated from the 20th to the last of December, will bring pigs from the 10th to the 20th of April, as the period of gestation is about a hundred and twelve days. I have a number on record of the above age, and find their produce to be from eight to thirteen pigs a litter. I know the usual wants of the farmers by hearing them frequently observe by their fire-side—‘let me have my stock of pigs to come the first of March;’ at the same times, unconscious of the danger of severe storm and cold blasts in March, and the little economy they have in providing shelters for their sows—frequently causes them to lose their entire stock of pigs, which is of no small value to a farmer that has his plan laid out to rear a great number of hogs, consequently must buy a stock or sell his grain at reduced prices. I have experienced the loss more than once to a considerable amount, consequently I have postponed breeding as before mentioned. Thus I have the security of better weather and the benefit of vegetation, which has a good tendency to cor-

rect any indisposition in sows, which frequently occurs in animals as well as in human beings. They are subject to inflammatory colds, and fever succeeding, dries up their milk, the pigs perish and death intervenes. To insure the farmer a quick and rapid growth in his lot of pigs, let them come about the last of April, (say 20th,) which is far preferable to March pigs, which have sustained much injury while very young. Stunted by frost and hunger, they cannot well be resuscitated by the best of attention afterwards.

“In an ordinary way, sows suckle their young in the spring from six to eight weeks, but in the fall the sows frequently wean their young in about six weeks. I would say to make your pigs thrive and grow on without much injury in their looks from weaning time, the better way is to prepare a covered pen for your pigs and have a hole sufficiently large so they can go in and out at pleasure, and always keep shelled corn by them. Be particular to commence thus feeding when they are about three weeks old, and it will aid the sow in rearing them, consequently they will wean them kindly and grow on without any ill effects which are common to weaning. These pigs will have age and sufficient growth by good clover and blue grass grazing—will winter kindly, which will insure the farmer a regular growth in his lot of hogs by the common mode of corn feeding, or following corn fed cattle; the excrements they collect from them are equal to cooked or steamed malt. After weaning their litter of

pigs, I would advise all the old sows to be spayed while reduced in flesh by suckling, as this period is most favorable. If a careful hand performs the operation in the left side, I seldom or ever lose any of that age and healthy rearing. They will fatten kindly and make about as much weight at selling time as their brothers of the same litter. You now perceive I do not winter any hogs more than one winter. I can say from experience, that sows with pig, winter better than barrows. They should be kept in a large woodland pasture, if practicable, by themselves, to prevent an injury from other hogs; be careful to have a house or shelter to protect them in inclement weather. Continue to select, every spring, the best female pigs out of your litters, such as you think will procure as many pigs as you may want to breed from, and by so doing you may rear your hogs on your farm at a moderate calculation of twenty per cent. over and above the prevailing practice of the day. In the common way the farmer has his males and females running together at large, and may expect to have litters of pigs every month in the year; but the lot of hogs are uneven, and consequently the stronger will be certain to abuse the weak, (a hog is a hog by name and nature,) and having masterly strength, in all cases the weaker are driven from their food and comfortable shelters in the fort; and in many cases we have a proof of the unproductive rural system of our farmers in having all sizes and ages. In our usual winters we see the small class of hogs,

when suffering from cold, deep snows, and wet weather, fall victims of death by smothering and suppression; the larger class being placed with the small ones. On all occasions hogs ought to be separated and classed according to size, and kept in the woodland where they may provide shelter in the forest foliage. Every farmer should provide himself with hog houses in his woodland pastures where they can get the foliage of the forest to make their beds. The place for these houses should be selected on the south or northeast side of a hill, so as to receive the warmth of the sun in the winter, and on a moderate slope so as to drain off the water, and that the sun may the better dry and warm the earth. As to form I am not particular, but always recommend the shelter to be close and dry; to aid in keeping dry, much care should be observed in trenching around the house to turn the water.

“Rearing a herd of Blooded Female Swine; Spring and Summer Treatment; Breeding and Winter Treatment. They should be left in a lot sufficiently large for exercise, containing plenty of water (for wallowing) and shade. If the grazing is not sufficient, I would advise a little corn, dish water, slops and soap suds, mixed together, to be given them, so as to keep the animals in a good healthy condition, but by no means, as when fattening, to hurry them in their growth.

“My practice for winter treatment is this; after my sows are all pregnant, if possible, I always have a large field of clover or meadow for their

grazing, or put them on rye or wheat fields and let them graze about twenty-four hours, twice a week, when the snow is off the ground; always providing comfortable dry sheds or houses for them, having a regular time for feeding, morning and evening. If any animal stands in danger from the want of regular feeding while pregnant, it is the sow, and there is great danger of her being fed too much at a time by careless or inexperienced servants, which is apt to produce abortions. Severe weather operates injuriously on sows, as they have frequently to make their beds in the snow, and sometimes in mud and water, where shelters are not provided for them—this is the cause why we so often hear our farmers say all their sows have slunk their pigs, and will have no pigs in the spring; and other causes still exist which I leave the careful to observe. When my sows are half gone with pig, (some time in February,) without fail I separate my sows and put them in lots, (four or five in number,) to prevent them from laying one upon another during cold snowy spells in February and March, which causes them, by oppression, to miscarry. This is the time that the greatest care should be taken with sows, as the period of littering is close at hand, for if they should miscarry, you have again to breed them, when their pigs will come late and much time be lost.

“BREEDING OF BLOODED Sows.—When they have attained to the age of eight months or thereabout, my practice is to breed them be-

tween the 1st and 15th of December, so as to make their littering come in the latter end of March, and by having shelters or houses for them, I can venture on breeding sooner than I would otherwise advise. I can rear this litter and have my sows stinted to boar, and bring the second litter between the first and middle of September, so as to have time to rear them, and so they will stand the ensuing winter. Then my sows can have about a month's rest until the 1st of December, which I very much approve of before breeding again; by so doing I have three litters in the period of twelve months. You now see the months I prefer for my blooded sows to litter in—the latter end of March and the 1st of April. The second litter from the 1st to 15th of September, and the third litter the latter end of March and 1st of April, which makes the period I have noticed. In stinting my sows to the boar, according to the time mentioned, I have been very particular to aid my memory, by committing to writing the time when they were stinted, and the mode of stinting. I was in the habit of the old custom in my commencement of doing business in this way. I soon saw there was an error somewhere, and my intentions were defeated somehow—and I reserved my lot of common sows to be bred in December, so as to bring pigs the first of April, when the weather was warm; while the old custom would be to let the boar run with some twenty or thirty sows, with the expectation of having a lot of pigs of one age, and, in general, one third of the sows, in all

probability, would come in season at one time. Admit the boar to be in good health and a full flow of animal spirits and strength, he will soon by severe service be impotent, and consequently only the first few sows will be impregnated. The sows will, in all probability, continue to come in season, and the boar be reduced every day, and yet his lasciviousness keeps him incapable of being fruitful. Hence, I found by experience my sows were unproductive, some having two or three pigs, and they came in much later than I expected, consequently I would recommend one boar to every ten sows, where you want all your pigs of one age and of good size. Of all the animal creation that I have any acquaintance with, the boar and ram will lose their juices faster from gendering. *I will aver that a boar may be in good health and high condition of animal spirits, and let him run with a lot of sows, twenty or thirty in number, and in four weeks time, he will lose one hundred pounds weight, although you feed him with what corn he may want to eat.*

“My young maiden sows, I hardly ever permit to be served but one time; my reason for this is that an old boar is too heavy and too strong for them; he mashes them down when they are willing, if not, he hunches them down with his nose, and bruises them so much, that it impedes their growth forever afterwards. It is astonishing to think how they frequently support them. I disapprove, under any circumstances, of letting the male to sows more than

once, when he is in good order. I recommend an aged male to maiden sows in all cases, to secure large, sprightly, well-formed and more prolific pigs. I have kept a true account heretofore of this practice. I let a lot of seven sows run with the boar until they had done with him, and kept their several dates. I also had a lot of young and old sows. I let the boar out of his pound and let him serve them once each, and kept their several dates. There was but one, out of six, that did not stand, and out of the lot of seven, there were two which did not stand. The lot of six produced from six to eleven pigs each, and the lot of seven did not produce as many pigs by four as the former. I kept both lots in the same manner with care, and they answered their several dates in littering, the period of gestation being about sixteen weeks. If you stint your sow to the boar, and keep her in a lot to prevent covering from other males, and she stands, she will be very sure to bring forth from a hundred and eleven, to a hundred and thirteen days; but if permitted to run with the boar, when she is in season, until she is done, I have recorded a number of instances and dates where the litters have varied from the set time of a hundred and eleven, to a hundred and sixteen days. This convinces me of the injury the boar sustains, while the sow receives no benefit. From his masterly strength she is constrained to do what nature does not desire, therefore the great discrepancy in the supposed periods of gestation.

“PARTICULAR FEEDING.—I always give my sows dish water slops, when practicable, through the winter, in a trough sufficiently long that they may all feed out of it without scuffling, with a pole confined on each end of the trough, to keep their feet out of the food, and prevent them from fighting and slipping over the sides of the trough. The ammonia in the dish water will suit impregnated sows much better than strong salt. I had twelve head last winter, in the severest weather and deep snows, and never gave but three ears of corn to each, morning and evening, and when the snow was off, my feed was from one to two ears, to each head, morning and evening.

“TREATMENT.—When within two or three days of their littering, I always separate my sows and put them in sheds or houses by themselves. I prepare leaves for their beds, if practicable, as I prefer them to straw or hay; they are light and warm, and there is no danger of the young pigs getting entangled, as they do sometimes in straw; and, being very weak, dying before they get to the teat. Whilst confined before littering, give them two ears of corn, morning and evening, and a plenty of water until they have farrowed. After they have littered, give nothing but water for twenty-four hours, then give two or three ears of corn night and morning, for some four or five days; never give rich slops for some four or five days before and after littering, for they are not in good health, but feverish, and rich food will increase the fever, or swell the teats, so that the

pigs cannot draw them, more especially in warm weather. I have known instances where the milk entirely dried up from fever, and the pigs died for the want of it. Our practice frequently is contrary to reason, in yielding to supposed calls of nature, therefore many feed their sows on the richest food immediately after littering. Thus producing that very injurious disease among the pigs—scours.

“TREATMENT OF THE PIGS AFTER THEY ARE SOME FIVE OR TEN DAYS OLD.—The sows should be kept separate from each other at least ten days after littering, to secure the pigs’ affections to their own mother, and to prevent them, in large herds, from scouring, which is so common when the sows are permitted to run and litter together. The strong pigs will suckle all the sows, for their superior strength will force the weaker and younger from the teats, who consequently soon become puny and weak, which result, such keeping as I have described, has a good bearing to prevent. I can say from experience that every pig will have its own teat, and regularly, as the sow calls or permits it to suckle, will return to its own unless forced away by a stronger hog. My practice is, after they have arrived at the age before mentioned, to put them in a lot of grass sufficient for their grazing and exercise, with a plenty of shade and water, if practicable, and to always keep other hogs, of any size, away from them, for the purpose of keeping the sows from fighting, and running over and crippling the young pigs, which is pretty generally

the case if they are permitted to feed together. I feed my sows while suckling with as much corn as they will eat up clean, and always, if possible, put the corn on smooth and dry ground for them."

Mr. Phinney, in remarking on this latter subject*—the treatment of young pigs—says:—"Pigs, when first taken from the sow, should be treated with great care to prevent scouring and from becoming stunted; when either of these happen, it will require many days and sometimes weeks to put them again in a healthy, growing condition. When first deprived of the maternal food, a little new or skim milk, boiled and slightly salted, and given to them *often* and in small quantities, will prevent scouring and greatly increase their growth."

On this point, Mr. Allen also says:†—"As soon as dropped, see that the pigs are cleaned and take the teat, and the dam rid of the placenta, and that carried off and buried. The watching should continue a little longer till the pigs get strong and lively, as sows of this breed (Berkshire) are so heavy as to endanger their being trod upon and killed. Although objections are made to giving food immediately after farrowing, I can see no reason in them; the poor animals are faint and dry, and require nourishment; feed them with swill in a moderate quantity, a little more than blood warm, as soon as they will get up and eat it. This is gradu-

* Vide New England Farmer, vol. xviii. No. 2. p. 71.

† Vide Franklin Farmer, vol. iii. No. 5, p. 36.

ally thickened the next day, and by the time the pigs are a week old, the dam is allowed to eat all it will without cloying. A mixture of oat and pea or Indian meal, one part of either of the latter to three parts of the former, is highly recommended for nursing, together with an equal quantity of steamed vegetables. As soon as the pigs will eat, a small open door should be placed in the pen, under which they can run and be separate from the sows, a trough set in, and milk with a light mixture of meal poured out for them. This greatly relieves the sow and adds much to the growth of the pigs; they wean then without scouring, losing condition in the least, or being checked in their growth. It is generally thought that pigs do as well to be weaned at six weeks old as later, as the little milk each then gets, is obtained by more or less quarreling, and adds a distaste to the other food; besides it is a great consideration to get them from the sow as soon as possible. Eight or ten great pigs, tugging at her breast for two or three months, are hard to be borne, and frequently very pernicious to her teats. In weaning, all but one should be taken off; put the dam on a short allowance, and in two days take the remaining pig away, allowing it at first to drain the breast twice a day, and then once in two or three days during a week; then turn the sow out to grass and leave off entirely, and commence gradually putting her into condition again. *The Berkshires are great milkers, and must be well attended to at weaning time, or their breasts will fill, be-*

come caked and swollen and finally ulcerate, and be the cause sometimes of the death of the sow.

“Experience,” says Bird Smith, Esq.,* “has taught me that no matter how many pigs a sow has over six, they should be reduced to that number, always retaining the large and healthy ones, for I can and will demonstrate, that six pigs will make more pork at twelve or eighteen months old than eight would of the same litter, and eight will make more than ten. Give to the six the food which you would give to the eight or ten, and you will find, in the result, the truth of my statement proven. It is essential that pigs *be kept fat while sucking*, and to have them so, six is a better number than eight or ten. At weaning time, or when sixty days old, the season when sows decline to milk, particular attention should be paid to the pigs, having them regularly fed with corn or swill, for at this juncture they are unaccustomed to *root for themselves*, and will rapidly lose their health, and their growth will be retarded if left to shift for themselves.”

A writer in the American Farmer directs that all food for young pigs should be cooked or boiled, and that corn meal should be mixed with chopped rye, in order to correct the effects of its fermenting quality. Each mess provided should also be slightly seasoned with salt. It is the opinion of N. C. Bement, Esq., in his able Report from the committee on swine,† that

* Farmer's Register, vol. vi. p. 382.

† Vide Cultivator, vol. vi. No. 1, p. 31.

eight or ten days after farrowing the sow may be allowed to leave her sty for a short time every day, and when the pigs acquire a little strength they may accompany her. A grass field is the best place, for the herbage improves the sow's milk; the pigs grow faster and are more healthy, and the sty is rendered sweeter by their absence. If the brood be numerous, they should be lessened, in order to relieve the sow, to eight or at most nine; though from ten to thirteen have been brought up in perfect order, without any apparent injury to the mother. In such cases, however, she should be a strong and healthy animal, and be supplied with an abundance of the most nutritious food. During the whole period of her nursing, the offals of the kitchen or dairy wash, with ship stuffs, ground oats, barley, buckwheat, or corn, mixed and given lukewarm, morning and evening; and in the middle of the day, boiled potatoes, beets or carrots, with a little Indian meal, or peas and barley ground and mixed, or something equally nutritious. Young pigs even while sucklers, should not be left wholly to the nourishment offered by the sow, but should be furnished two or three times a day with skim or butter milk, whey, or pot liquor, made lukewarm, and having a little meal, shorts and boiled roots mixed up with it; or if this be thought too troublesome, skim milk, with a small quantity of meal, may be left constantly for them, in a part of the sty where the sow cannot have access. In six or seven weeks, they will generally weigh from thirty to thirty-

five potunds, and be strong enough to wean. After weaning, they should not only be kept dry and clean, but regularly fed."

For the tendency of sows to *destroy* their own offspring, various reasons have been assigned, and different remedies proposed. That this is a disposition which exists more in some breeds than others, (as for instance in the China,) is well known, and to its injurious tendency many farmers can bear witness. A correspondent of the *Yankee Farmer** assigns costiveness, and the irritability and frenzy which it produces, as the cause of this unnatural conduct, "to prevent which give the sow for some weeks before weaning, a heaping table spoonfull of flower of brimstone, each week, in her food—a few raw potatoes will aid the brimstone. Sows that run at large are not apt to destroy their pigs; then they choose their food, as grass, &c."

The Hon. O. Fiske remarks†:—"In most cases where I have inquired into the fact, whether in old or young breeders, I have ascertained that they have been disturbed in some of their essential habits, either having been removed from their companions, their range restricted, or from being removed from one pen to another. All these changes, however, may be effected with safety, by allowing them sufficient time to become accustomed to them; four or five weeks at least. I have known sows do well with a second litter, after having destroyed

* Vide *Yankee Farmer*, vol. i. p. 69.

† Vide *New England Farmer*, vol. v. p. 214.

a first, under one of the above excitements. Hence it would be unwise to condemn to death one which bids fair otherwise to be a valuable breeder, even for this most unnatural crime." "Another writer," says Fessenden,* "directs to separate the sow from the rest of the swine six or eight weeks before her bringing forth, so that she may become accustomed to her pen. Care should be taken, however, to have her pen kept dry and well littered; always give them litter enough so as not to be obliged to give any for six days before the time, for nothing disturbs a sow more than an abundance of litter, and which, in my opinion, has a great tendency to induce her to destroy her young. If the sow is with other swine till within a few days of her bringing forth, and then separated, she will not get accustomed to her pen, and will be pretty sure to destroy her pigs." Raw salt pork, cut in small pieces, and given, will prevent them from eating their pigs. I have seen it given after they had eaten two or three of their litter, with good success. But, to prevent mischief, it should be kept by them at this time." In confirmation of this remedy, another writer† says:—"I have been careful for a week before my sows were about to farrow, to give them some butchers' meat, which does not cost much; if easy to be procured, give them a plenty, and I venture to say they will not eat their pigs.

A third correspondent of the same paper ob-

* Vide Complete Farmer, p. 163.

† New England Farmer, vol. ix. p. 298.

serves* :—"When the period of weaning is near, I take the sow apart and give her free access to a warm bed room, of ample dimensions in my barn, with a dry plank floor, where the shingled walls prevent the entrance of cold, rain or wind, with just enough straw to amuse her 'moments of anxiety,' but not enough to allow a single pig to cover his head and lose his road to the fountain of comfort. The Complete Farmer mentions a communication of 'Berkshire,' who attributes the evil to the confinement of the sow in a tight pen, from the ground, and the want of a suitable supply of potatoes, turnips, ruta бага, &c., in addition to their other food. Another correspondent who has raised fine pigs on board of a whale ship at sea, without grass or roots, believes animal food the specific remedy for the unnatural inclination of sows to destroy their offspring. And 'a subscriber' is sanguine in the opinion, that if sows are so placed as to come to the ground a few days before pigging, no disappointment would ever happen in the loss of pigs. If it is not convenient to let them ramble at large, a temporary pen upon the ground is equally good."†

In the report of the committee on swine,‡ we find the following advice upon the subject :—"It is a good precaution to sponge the backs of the pigs immediately after they are born, with a strong infusion of aloes in lukewarm water,

* New England Farmer, vol. ix. p. 305.

† Page 164.

‡ Cultivator, vol. vi. p. 31.

as its bitter taste will prevent the sow from destroying them; care should also be taken, before farrowing, to separate her from other hogs. To protect the pigs, an open frame or strong rail on each side of her, elevated a few inches from the ground, under which the pigs may run, has been recommended."

Mowbray, in his treatise on poultry, &c., remarks:—"A vigilant swine herd, solicitous to preserve all the pigs, will watch and attend the farrowing sow day and night. As one precaution, the breeding sows ought not to be kept fat and heavy, yet in good health, and full strength. Few keepers will, or ever do, go the length of attending the sow, satisfying themselves that she will be safest, left to her own care. To those who are willing to undertake such an office, a hamper or basket of straw will be found convenient in which to withdraw the pigs from danger when it may be needful, in order to replace them properly as occasion may suit, which practice it may be necessary to repeat during two or three days until the pigs shall have acquired strength and caution sufficient to secure themselves. It may, indeed, be profitable to lose part of a too numerous litter, but accident will not respect the quality of the pigs, and the most puny and worthless may escape. None must be saved beyond the number of teats, and, upon an average, nine is a sufficient number. Would the sow submit quietly, strapping her jaws during day and night, would be an effectual security in case of unnatural voraciousness."

SPAYING SOWS.—The great advantage, in the increased disposition to fatten, secured by this operation, is generally known. It is a process, however, which is not often resorted to, from ignorance as to the proper mode of operating, and consequent fear of injuring the animal. In the hand of one sufficiently acquainted with the business,—and the requisite knowledge is readily obtained from a single operation,—the experiment is an easy one, and when care is exercised, always attended with advantageous results. In the absence of plates, in aid of any description, it may be difficult to describe the process minutely to our readers. We trust, however, to exhibit the matter with sufficient clearness to enable any one, after practising a few times on a dead animal, to carry the operation to a successful result.

The object of spaying, (which is to prevent the sow from breeding and increase her aptitude to fatten,) is accomplished by the entire removal of the ovaries, or “prides,” as they are often termed, which “give the first impulse for venereal indulgence, and furnish whatever is contributed by the female towards the formation of a new being.” These ovaries are small round substances attached to the uterus, or in ordinary phrase, the “pig-bag,” and vary with the age of the animal, from the size and shape of a kernel of corn, to that of a common nutmeg, a little flattened. Those of very young pigs are of a white color, but in sows farther advanced, they are more or less red in appearance, and resemble small tumors.

The only instruments required in this operation, are a common pocket knife with a large blade, well sharpened, and one of the smaller straight sail needles, threaded with strong waxed thread.

The process is as follows:—Strong cords should be fastened to the hind legs of the animal, by which she can be suspended, with the belly towards the operator, from a spike or pin driven into an upright post. The mouth should be tied in such a manner as to prevent squealing, and the fore legs should be held by an assistant, in order to prevent the animal from struggling, as well as to keep the body firmly pressed against the post. When these arrangements are completed, the operator is to make an incision, lengthwise, between the four back teats, commencing between the two nearest the hind part of the animal, and passing down the belly towards the head, cutting through the outer skin, the flesh and muscles beneath, to the peritonæum, or membrane which envelops the bowels. This must also be divided carefully, that the intestines beneath may not be wounded, and is best effected, by placing the knife at the lower point of the opening made, and passing it gently upwards, then drawing the membrane nearer the operator, and presenting the back of the blade towards the intestines. The length of the slit should, in general, be about two inches, or sufficient for the admission of two fingers, which are to be introduced through the wound into the bowels, and passed upward towards the tail, in search

of the uterus, or "pig-bag," which will be readily distinguished as a flat substance, appearing to the touch like portions of a wet, empty bladder. At whatever point this is seized, the operator is to retain his hold of it, gradually drawing it towards him, and working his finger forward, until he meets one of the ovaries, which he will recognise as a hard kernel like substance, as well as by its firmness and reddish color. Grasping this firmly between his finger and thumb, he is to cut it off, as near the uterus as possible, as upon its entire extermination depends the successful result of the experiment. After one of these ovaries, or prides, are removed, the uterus must still be held as before, and the finger gradually worked along it to the opposite side, where the remaining "pride" will be found, which must also be detached in the same manner.

The proper method of sewing up the wound, demands considerable attention, and it should be borne in mind that the object, is to cause the aperture to unite along its edges as equally as possible. To effect this, the needle is placed for the first stitch, on the belly, at the right hand side of the lower part of the opening, and forced through the outer skin, flesh, and muscles into the bowels, care being taken that its point does not injure the intestines. The greater portion of the thread is then drawn through, and the needle passes to the opposite side of the wound, and made to enter beneath the outer skin, and carried through to the bowels as before. The object designed, is to bring the

lower edges of the wound together first. Four of the cross stitches described will be sufficient to effect this, and should be taken, on each side, below the outer skin until the upper part of the opening is reached, when the last stitch should be passed, like the one at the commencement, through the outer skin, muscles and peritonæum. The thread, if drawn gently at both ends, will now close the lower edges of the wound. The operator now continues closing the upper portion of the wound by stitches, exactly opposite each other, until he arrives opposite the stitch first inserted. Here the ends of the threads are tied, and a slight portion of tar-salve is rubbed over and around the wound. No farther care is needed, and the distended parts are soon united.

This operation is sometimes performed by an incision through the left flank, and is resorted to when sows are with pigs. Young sows not intended for breeding, are spayed at five or six weeks old to great advantage. In older animals, the best season for operation is at the times they exhibit desires for sexual intercourse, as at those seasons the ovaries are full and easily distinguished.

As a general rule, all animals on which the process of spaying is to be performed, should be shut up and allowed no food the night before, nor any on the morning of the operation; in this way, allowing ample time for a free discharge of the contents of the bowels.

This operation when performed by a skilful hand, is safe and easy, and a few experiments

made on dead subjects at first, will impart the requisite knowledge. Ignorance of the proper mode of conducting the process, has prevented its more general adoption.

The following substitute for spaying has been recommended—the introduction of hard round substances, through the vagina. Says a correspondent of the cultivator,—“the *modus operandi*, in this neighborhood, as practised by myself lately, but much longer by others, is simply this; for convenience use a common goose quill as a tube, cut off smoothly at the small end, the other sharpened as a tooth pick, to be used as a handle; then pass the small end down the vagina two inches or more, (according to the size of the animal,) through which drop six or seven shot, say No. 3, and the work is complete. Nothing can be more simple, innocent and efficacious.”

A writer in the *Genesee Farmer*, in reference to this method, remarks:—“A new mode has been adopted, as a substitute for spaying, which is of great importance to the agriculturist. From a number of contradictory reports, and from a want of knowledge in operating, the system met with few advocates, and for the best reason, because the instructions were to use shot which did not answer the purpose. Instead of shot, a bullet is now used, which fully and completely answers the desired object. I have the best assurance of its efficacy, and with pleasure make the communication to the world.

“Mr. Hancock Davis, my near neighbor, has tried the experiment, and the result was com-

plete and satisfactory, so much so, that he has operated on all his young sows, to the number of fifty; they are all healthy, thriving and fat, and as barren as if they had been spayed, showing no inclination for the boar. He performs the operation by hanging the sow up by the hind legs in the manner of spaying, and through a reed or any tube, introduced two or three times into the vagina, a small rifle bullet is deposited."

The proper modes of operation for castrating the boar are so generally known, as to require no explanation. With the efficacy of either of the proposed substitutes for spaying, the present writer has no acquaintance. The first is mentioned by a writer in the *Franklin Farmer*, (we believe Bird Smith, Esq., of Kentucky,) as being unsuccessful.

The power of ascertaining the weight of live stock without the tedious process of weighing, is one of great practical utility, and we annex the following remarks on the subject, from the *Cattle Keeper's Guide*:—

"METHOD OF ASCERTAINING THE WEIGHT OF CATTLE WHILE LIVING. This is of the utmost utility for all those who are not experienced by the eye, and by the following directions the weight can be ascertained within a mere trifle:—Take a string, put it round the breast, standing square, just behind the shoulder blade; measure on a foot rule the feet and inches the animal is in circumference—this is called the girth; then with the string, measure from the bone of the tail, which plumbs the line

with the hinder part of the buttocks ; direct the line along the back to the forepart of the shoulder blade ; take the dimensions on the foot rule as before, which is the length, and work the figure in the following manner ; girth of the buttock, 6 feet 4 inches, 5 feet 3 inches ; which, multiplied by 23, (the number of pounds allowed to each superficial foot of all cattle measuring less than seven and more than five feet in girth) makes 713 pounds and allowing 14 pounds the stone, is 50 stone, 13 lbs. Where the animal measures less than nine and more than seven feet in the girth, 31 is the number of pounds to each superficial foot. Again, suppose a pig or very small beast should measure two feet in girth and two feet along the back, which multiplied together, makes 16 square feet ; that multiplied by 11, the number of pounds allowed for each square foot of cattle measuring less than 3 in girth, makes 44 pounds, which divided by 14, to bring it to stones, is 3 stones 3 pounds. Again, suppose a calf, sheep, &c., should measure 4 feet 6 inches in girth and 9 inches in length, which, multiplied together makes $16\frac{1}{2}$ square feet, that multiplied by 16, the number of pounds allowed to all cattle measuring less than 5 feet and more than 3 in girth, makes 26 pounds, which divided by 14, to bring it into stones, is 18 stones, 12 pounds. The dimensions of the girth and length of black cattle, sheep, calves, or hogs, will be as exact, taken in this way, as is at all necessary for any computations or valuation of stock, and will answer exactly to the four quarters, sinking

the offal, and the calculation is one which every man who can get a bit of chalk may perform ; a deduction must be made for a half fatted beast, of one stone in twenty, from that of a fat one ; and for a cow that has had calves, one stone must be allowed, and another for not being properly fat."

CHAPTER III.

Cleanliness and humane treatment essential in rearing swine—Allotment of suitable and convenient pens—The proper method of obtaining large quantities of manure from swine, and its great value—Pastures for hogs—Mode of constructing styes—Proper form of trough—Stall pens—Notice of various piggeries—Proposed plan of piggery.

It was remarked by Columella, more than eighteen hundred years ago, that “the bodies of cattle ought to be rubbed down daily as well as the bodies of men” and that this process, no less than a supply of food, was requisite for their improvement. The truth of this observation from one of the most ancient agricultural writers, though lamentably disregarded or forgotten in the practice, is still recognised and sometimes mentioned in the theories of later years. It is an opinion, which, even in the absence of the proof furnished by occasional experiments, seems to demand the immediate consideration and adoption of humane and prudent farmers. And yet, if we except the horse, whose glossy coat and well rubbed limbs prove oftener the pride of his owner in neatness of appearance, than any reference to the comfort of his steed, how little attention is paid to the outward condition of those valuable animals on whose growth, maturity and sale, often depend his means of subsistence and anticipated wealth.

But it is not alone the outward condition

and appearance of the animal that deteriorates by such neglect—the inward, by a strong sympathy, suffers also. It is known that many of the fluids of the system pass off unperceived by exertions from the surface, and that this insensible perspiration is needed to secure the healthy tone and action of the body. The partial stoppage of this natural channel for the waste fluids of the system is soon rendered apparent in a greater or less derangement of the general health, while its total suppression is followed by most violent disease. Swine, it is well known are subject to cold and fevers, originating, doubtless, as in the human system they often do, from a deranged state of the excretory vessels of the surface. To guard against these evils, among other remedies, cleanliness and friction are essential requisites. Of the diseases of these animals, the symptoms by which they are indicated, and the necessary treatment, we shall speak hereafter. At present, we would merely call the attention of the humane breeder, or him whose object is mere gain, to the important fact, that upon the state of the skin materially depends the health and consequently the advancement in flesh, and subsequent profit of the animal. Observation as to this particular, as well as the quality and quantity of food, the mode of its preparation and time of feeding, would banish, to no small extent, the maladies to which swine are subjected.

Says a correspondent of one of our most valuable periodicals,*—and his remarks though

* Vide Farmer's Register, vol. vi. p. 557.

referring to another animal are to a considerable extent applicable to hogs,—“Whenever cows are regularly curried and rubbed, they are invariably stronger and in a healthier condition; not liable to cutaneous and other diseases; and from experience, I know they yield more milk, and that too of a better quality, a cleaner milk, richer cream, and sweeter butter necessarily follow.

“I make it a practice to curry my cows once a day very carefully. I never suffer any dung to stick to their coats, it looks bad and injures the cows. Many farmers seem to think that in order to have healthy and good cows you need only to feed them with a sufficiency of food; however, I am fully convinced from experience, that cows may be well supplied with food, still they will not be as profitable as they would be, if kept perfectly clean and free from all kinds of dirt, and matter obstructing perspiration; besides this, if cows are kept perfectly clean, they will thrive upon less quantity of food.” The following experiment is interesting as substantiating the position we have taken—“Six pigs of the Norfolk breed, and of nearly equal weight, were put to keeping at the same time, and treated the same as to food and litter for about seven weeks. Three of them were left to shift for themselves as to cleanliness; the other three were kept as clean as possible by a man employed for the purpose, with a curry comb and brush. The last, consumed in seven weeks fewer peas by five bushels, than the other three, yet they weighed more when killed

by two stone and four pounds, (thirty-six pounds) upon an average, or six stone twelve pounds upon the whole." * Says a writer in the *Genesee Farmer*†:—"Almost any hog, in any condition and place, will improve, but to profitably fatten, not only must the food be of the right kind and given in the proper manner, but every necessary attention should be paid to the comfort, cleanliness and health of the animal."

It is a great error, says Low, to leave these animals in a state of filth and neglect. The hog is not a filthy animal by choice. He delights in a clean bed; he will wallow, indeed, in the mire like the elephant, the rhinoceros, and other pachydermatous or thick skinned animals, to which he belongs, but this is not because he prefers filth, but because he loves coolness and moisture.

But it is not alone the health, and consequent value of the hog which cleanliness secures, but a comparatively great degree of docility and quietude, on the part of the animal thus treated. We have ourselves witnessed the successful result of daily rubbing, on different breeds of swine, rendering them tractable, and familiarized to the approach and touch of man. Indeed, so great appeared to be the relish for the comfort thus afforded them, that the appearance of their owner was the signal for their approach. No sooner was the operation of rubbing on one side finished than they would rise

* The Bee, Pictou, Nova Scotia,

† Vol. ix. p. 299.

and present the other, and seemingly evince in numerous ways, their gratitude for kind and gentle treatment. "I have ever observed," says a writer,* "the sagacity of swine to be equal to that of any domestic animal. The too general barbarous treatment of kicking and beating them as if inanimate beings, only tends to make them vicious and furious. I do not, in the least, permit any of my swine to be in the least abused, but give encouragement to have them gently treated. By this mode, they will follow the boy who feeds them, like so many dogs, and will even in the open fields lay themselves down to be soothed and played with. One of my laborers, living near me, was lately employed on a common in front of my house. I observed a pig near him all the morning. When the man went to dinner, the pig followed him; when he returned the pig returned, which induced me to be very attentive, and I found the pig grazing within two yards of him the whole day. On inquiry, I found that he had not purchased the pig more than a fortnight before, when he was so unmanageable that it was with difficulty he could drive him home, and that according to his usual method of gentle treatment, the man found that pigs could be so tamed as to follow him wherever he would permit them."

The allotment of suitable enclosures, and the construction of convenient pens for swine, are matters of great importance to those who

* Bath Society papers, vol. iii. p. 328.

rear these animals with a view to profit. The miserable custom of permitting swine to roam at large, unattended by a swine herd, and allowing them to gather food throughout extensive districts, cannot be too severely reprehended. It is desirable that every farmer who consults the comfort of his animals should have both pens and pasture—the latter well covered with clover, of small dimensions, and, if possible, affording the hogs ready access to water. To effect this object, the fences which enclose the pasture may be extended so as to embrace a portion of some running stream, or if this is not practicable, some spring, from which water may be constantly flowing into an artificial reservoir. It is found that hogs thrive better, when they enjoy the means of slaking thirst as nature prompts them, than when they are restricted to water drawn from wells and furnished at stated intervals. Even in the absence of a stream suitable for the purpose, or a spring, water should, if possible, be conveyed, to some artificial pool, or trough, in sufficient quantities for their use at any moment. The size of the pasture will of course depend, to some extent on the situation of the farm, and number of hogs. In general, however, where the herd is numerous, it is deemed advisable, to scatter it in different enclosures, placing those hogs that are nearly of the same age and strength together. Small orchards, well set in clover, afford an excellent pasture for hogs. Their manure greatly enriches the ground; while the roots of the trees, near which, in such enclo-

tures, their rooting propensities are mostly exercised, derive great advantage from frequent loosening of the soil.

It is a matter of great importance to the farmer to provide such enclosures, and adopt such treatment, as will secure from his hogs the greatest quantity of manure. Hog manure is extremely valuable, and large quantities may be obtained with slight attention. Where these animals are allowed the range of small yards or pastures, the method pursued by a correspondent of the Farmer's Cabinet, will prove advantageous*:—"I usually keep and fatten, he remarks, four hogs in the year; these I keep confined in a yard twenty feet square, with a warm and convenient shed attached thereto, as a shelter for them during the night time, and in cold and stormy weather." Into the yard he placed the scrapings of ditches, the dirt that is continually in and about buildings, and this became mixed with the straw with which they were littered. The whole was cleared out as often as was judged expedient. The quantity and quality of the manure would be greatly increased, if the pen was supplied with weeds, (an excellent way this of turning these noxious plants to a good account,) and in the absence of weeds, which by the way is not very common, even on our best cultivated farms, resort may be had to the woods; here the farmer has an abundance of leaves and other rubbish that may be used to great advantage. "By the

* Vol. ii. p. 43.

adoption of the above course, more than twenty-five loads of manure was obtained, as the product of four hogs, and this, too, of a superior quality to that generally derived from the stable or yard."

Another writer in the *Yankee Farmer*,* says:—"My plan is this; yard the hogs through the year. Give each hog, to work upon, ten loads of manure from the swamp. Some men think to avoid expense in keeping, by permitting their hogs to 'run at large,' or in a large pasture. This is a bad practice; the hogs 'run away' so much of their flesh, that it requires nearly as much to keep them in a thriving state as if they were yarded. If it did not, the pasture would be much more preferable for other stock. More than this, the hogs will convert about four loads more of mud into good manure, which will more than twice pay the extra cost of yarding."

Another correspondent still, of the same paper remarks†:—"I keep my sty well littered with straw, leaves, weeds, soil from the woods, and meadow earth, obtained from ditching, by carting, together with that put into the yard, from two to ten loads per week. I sometimes put a few handfuls of rye in different places in the yard, and let in the hogs. Feeding them there for a few days, they completely stir up and commute the contents of the yard. I am confident that I make four times the quantity of manure my father did, and with no increase

* Vol. iii. p. 410.

† Vol. i. p. 67.

in the number of stock, and of a little better quality, too, comparatively none of its strength being washed away by the rains and evaporated by the sun."

The suggestions of a correspondent to the Northern Farmer, quoted in the Farmer's Register, contain much information on this subject. After stating the reasons which induced him to abandon the ordinary mode of suffering his pigs to run at large, for the better one of confining them in pastures—and his subsequent exchange of this for a smaller enclosure, which he contracted from time to time, until satisfied that a yard of twenty feet by fourteen, was sufficient for six hogs, if well supplied with materials to make manure in to advantage, he thus continues:—"My method of supplying these materials is the following; after having cleared their yard at the season of planting, I put into it such portions of straw as I may have on hand after the season of foddering is past; and if I have not a sufficient quantity of this to furnish the necessary supply till vegetable substances attain a sufficient growth to be profitably collected, I put in earth collected from the low places by the side of the highway; though this I more generally place in or near my barn yard, in a situation to receive and retain the wash that might otherwise escape from that. Brakes and weeds of any kind are valuable. These I make use of, to the extent they are attainable, when in a green state, as I consider green vegetable substances, for this purpose, far more valuable than dry. Potato

tops, when pulled for early use, before they become dry and shriveled, I consider equal if not superior to any other green substance for this purpose. Pea vines I usually put into my hog yard after the peas are thrashed off, and if some are put in before being thrashed, they are as gratefully received by the inmates of the yard. The quantity of manure made by my hogs is, for each one, double that made by each cow for the same period of time. The quantity of vegetable matter suitable for manure, that remain in most crops after the fruit and grain is selected, and the amount of manure that can be obtained if this matter is carefully collected and carted to the pens of hogs and other animals are indeed astonishing. "The expressed cane," says J. H. Cowper, in an able communication to the *Southern Agriculturist*, "tops and leaves, from an acre of cane yield about 10,000 lbs. of dry vegetable matter. An acre of corn including blades, stalks, husks, and cobs, gives about 3500 lbs., when the yield of corn has been 20 bushels; and the after crop of peas 1000 lbs.—together 4500 lbs. An acre of solid peas 2000 lbs. The potato vines, pumpkins, and turnips, being eaten green, contribute only to the production of fluid manure. The total quantity of vegetable matter to be applied to the manuring of 16 acres in crop, will therefore be—

4 acres in corn, at 4500 lbs. per acre,	. 18,000 lbs.
1 acre in peas and turnips,	2,000 "
3 acres in cane,	30,000 "
	<hr/>
	50,000

which, if merely rotted by the rain, will yield 100,000 lbs. of manure, and if rotted by urine and dung of stock from 150,000 to 200,000 lbs. or at least 25,000 lbs. of manure to each of the four acres proposed to be manured.

We are inclined to dwell still longer on the subject of manure, because its great importance, and the proper modes of collecting the greatest quantity, seem in many portions of our country to be wholly overlooked. Especially is this the case throughout the western states. Trusting to the extreme luxuriance of the soil, the lands of many farmers are burdened with one exhausting crop after another, until at length the productiveness of the farm is materially reduced, and finally measures are necessarily resorted to, to improve an impoverished condition of the soil which proper manuring would have prevented altogether. Many persons seem to consider a yard where the dung of animals can be collected, sufficient for all purposes—little dreaming that upon the construction of this enclosure depends both the quality and quantity of the manure; that successive rains may be gradually washing away the most fertilizing portions of their yard, or excessive fermentation causing the escape of gases which, if possible, should always be retained. The dung of animals, when intended for manure, should be protected as far as practicable from exposure to the air. "He," says Arthur Young, Esq., "who is within the sphere of the scent of his dunghill, smells that which his crop would have eaten, had he permitted it. Instead of

manuring the land, he manures the atmosphere, and before his dunghill is finished, another parish and perhaps another county." "As few exhalations," remarks Fessenden,* "as possible, ought to be suffered to rise from the excrements of animals. Fresh manure ought to be kept as carefully from the sun and rain, as grass which has been cut for hay. But how are these objects to be effected? The answer is an easy one. Prevent the rain from draining off the best portions of the manure, by constructing a yard in a dishy form, lowest in the centre, so that the urine of the animals may be collected in a reservoir and retained; and prevent fermentation, or absorb its products by occasionally scattering over the dungheap a quantity of the same earth with which the yard is bedded. "Earth," remarks the author of the letters of Agricola, "is a powerful absorber of all the gases which arise from putrefaction. Put a layer of common soil along the top of a fermenting dunghill, from twelve to eighteen inches thick, and allow it to remain there while the process is carrying on with activity, and afterwards separate it carefully from the heap, and it will have been impregnated with the most fertilizing virtues. The composts which of late have attracted such universal attention, and occupied so large a place in all agricultural publications, originated in the discovery of the absorbing power of the earth, and in the application of it to the most beneficial purposes. A skillful agriculturalist would no more think of

* Vide Complete Farmer, p. 173.

allowing a violent fermentation to be going on in his dunghill, unmixed with earth, or other matter, to fix and secure the gaseous elements, than the distiller would suffer his apparatus to be set at work, without surmounting his still with the worm, to cool and condense the rarefied spirit which ascends to evaporation. In both, the most precious matter is that which assumes the aeriform state; and to behold it escaping with unconcerned indifference is a demonstration of the most profound ignorance.

A slight fermentation in a dunghill, may indeed be advantageous in causing the woody fibre, contained in many of the substances deposited there, to decay and dissolve, but wooden fibre is the only vegetable matter that requires this process to render it nutritive to plants. In the straw of chaff and litter, as well as the leaves and other products of the forest—which may be advantageously placed in barn yards for conversion to manure—will be found considerable portions of fibrous matter, which must be fermented to be useful. It therefore becomes a matter of great importance to ascertain correctly how far this process of fermentation should be allowed to proceed. On this point Sir Humphrey Davy remarks* :—“ In all cases where dung is fermenting, there are simple tests by which the rapidity of the process, and consequently the injury done, may be discovered. If a thermometer, plunged into the dung, does not rise to above 100 degrees Faren-

* Vide Davy's Agricultural Chemistry, republished in the Farmer's Register.

heit, there is little danger of much aeriform matter flying off.

“When a piece of paper, moistened in muriatic acid, held over the steam arising from a dung-hill, gives dense fumes, it is a certain test that the decomposition is going too far, for this indicates that volatile alkali is disengaged.

“When dung is to be preserved for any time, the situation in which it is kept is of importance. It should, if possible, be defended from the sun. To preserve it under sheds would be of great use; or to make the site of a dung-hill on the north side of a wall. The floor on which the dung is heaped should, if possible, be paved with flat stones, and there should be a little inclination from each side towards the centre, in which there should be drains, connected with a small well furnished with a pump, by which any fluid matter may be collected for the use of the land. It too often happens that a dense mucilaginous and extractive fluid is suffered to drain away from the dunghill so as to be entirely lost to the farm.”

The urine of animals is one of the most valuable manures that can be applied to land; but it should be applied in a recent state, as a great portion of the soluble animal matter it contains is destroyed during the process of putrefaction. If unmixed with solid matter, it should always be diluted with water, as in its pure state it contains more animal matter than can be safely absorbed for the nourishment of plants.

According to some writers and practical farm-

ers,* the value of the urine of cattle, if properly preserved and applied to the purposes of vegetation, is greater than that of all the dung which the same animals would yield. A letter from Charles Alexander, near Peebles, in Scotland, addressed to Sir John Sinclair, in 1812, contains much valuable information on this subject. "This intelligent farmer had long been impressed with the great importance of the urine of cattle as a manure, and he set about to discover, by a long and well-conducted series of experiments, the best method of collecting and applying it. He began by digging a pit contiguous to the feeding stable, but distinct altogether from that which was appropriated for the reception of the dung. The dimensions of this pit were thirty-six feet square, and four feet deep, surrounded on all sides by a wall, and the solid contents were one hundred and ninety-two yards. Having selected the nearest spot where he could find loamy earth—and this he always took from the surface of some field under cultivation—he proceeded to fill it, and found that, with three men and ten horses, he could easily accomplish twenty-eight cubic yards a day; and the whole expense of transporting the earth did not exceed twenty-two dollars. When the work was complete, he leveled the surface of the heap in a line with the sewer which conducted the urine from the interior of the building, on purpose that it might be distributed with regularity and might saturate the whole from top to bottom. The

* Vide Complete Farmer, p. 175—177.

quantity conveyed to it, he estimated at about eight hundred gallons. The urine was supplied by fourteen cattle, kept there for five months on fodder and turnips. The contents of the pit produced two hundred and eighty-eight loads, allowing two cubic yards to be taken out in three carts; and he spread forty of these on each acre, so that this urine in five months produced a compost sufficient for the fertilization of seven acres of land. He states farther, that he had tried this experiment for ten years, and had used indiscriminately in the same field either the rotted cow-dung or the saturated earth; and in all stages of the crop he had never been able to find any perceptible difference. But what is still more wonderful, he found his compost lasted in its effects as many years as his best manures; and he therefore boldly avers that a load of each is of equivalent value. Mr. Robert Smith, of Baltimore, has his stables constructed in such a manner that all the liquid discharges of his cattle are conducted, together with the wash of the barn yard, into a cistern, pumped into a hogshead, and applied in a liquid state to the soil which it is wished to manure. This mode of making use of this substance, is likewise recommended in the Code of Agriculture:—"The advantages of irrigating grass lands with cow urine almost exceed belief. Mr. Harley, of Glasgow, (who keeps a large dairy in that town,) by using cow urine, cuts some small fields of grass six times, and the average of each cutting is fifteen inches in length. There are disadvantages,

however, connected with this mode of applying this powerful manure. It must be applied soon after it is formed, or oftentimes the putrefactive process will commence and deprive it of part of its efficacy. And, as urine is of a scorching quality, it is unsafe to apply it to growing crops in great heat or drought. Hence it is unadvisable to use it except for grass, after the month of April and May, unless diluted. It is particularly useful in the spring, when the application of liquid manure gives a new impetus to the plant and makes its growth more vigorous. This manure forces newly planted cabbages in a most remarkable manner."

In addition to pastures, pens, especially for fattening hogs, will be required, and upon the construction of these with reference to securing the double objects of convenience and economy, great attention should be paid. Many of the styes, even on extensive and otherwise well provided farms, are miserable structures, ill-adapted to the comforts of their inmates and the purposes proposed by their erection. Mowbray, while writing on the conveniences for swine, remarks* :—"Room and ventilation are objects of the greatest importance, where numbers are kept, and dry lodgings, without which essentials success must not be expected. Nor are swine, in whatever state, proof against excessive cold, for I have known instances of their being frozen to death in their sty, and have always remarked, that severe weather materially checks their thriving, unless they be sufficiently de-

* Mowbray on poultry, &c., p. 163.

fended from the chilling effects of the air. The sty, situated upon a dry foundation, as well as sheltered above, should be paved at bottom, to the end that it may be kept clean and dry, the operation for which should be daily performed; for although pigs will wallow in the mire, they are yet more thrifty in clean lodgings. As swine, confined, usually employ their leisure time in demolishing with their teeth the wood work within their reach, the modern cast iron troughs are preferable; at any rate wooden troughs ought to be iron bound." "The pigging house should be warm and dry, and secure from the inroads of foxes and other vermin, which have been known to steal sucking pigs from the sleeping or absent sow. Short straw is preferable for a bed, but in not too great quantity, lest the pigs be smothered beneath it; this should be renewed, with due regard to cleanliness; and, as the unwieldy sow is apt to crush her young against the wall, it is proposed in the *New Farmer's Calendar*, to append an inclining or projecting rail around, beneath which the pigs may escape on the down lying of the sow." In the *Complete Farmer*,* we find the following observations:—"Swine should not be kept in close and filthy pens. Though they wallow in the mire, their object is coolness not nastiness, and they thrive faster and enjoy better health when allowed clean and dry lodgings than when they are not thus accommodated. The late Judge Peters, of Pennsylvania, in an article entitled, 'Notices

* Page 164.

for a Young Farmer,' &c., observes, 'In airy, roomy, and moderately warm pens, paved and boarded, and often cleaned, they are healthy and thriving. They show a disposition to be cleanly, however otherwise it is supposed, and always leave their excrementitious matter in a part of the pen distinct from that in which they lie down. No animal will thrive unless it be kept clean.' "

In the "Countrie Farm"—a work to which we have before referred—we find the following observations, which, notwithstanding the antique garb in which they are presented, are interesting, as evincing the notions of olden time upon this subject. Speaking of hogs the author continues—"And to the end that the corruption of the aire which this kinde of beast maketh in close places, may not cause him to haue any ill-sent or other diseases to grow vpon them in their cotes, especially when there are any number together, it behooveth that the doore thereof be made with thorough lightes of great barres, or clouen boards, to the end that their euill aire may passe away, and that which is good may come in place continually, and it is meet that the doore should give downe verie neere vnto the causey, to the end that they may not lift it vp with their snouts and cast it off the hinges; for this cattle can hardly endure to be shut vp, but gnawe and bite with their teeth, whatsouere it bee that hindreth them from coming forth when they are enclosed.

"The hogs which you intend to keep in and to fat shal not come forth of their sty, being

alone and free from others, neither shall they haue any lighte but at the doore which is made to go in at for to dress them. The care about these is not so great as of other cattle, excepted only the keeping of them cleane, and knowing how to make them good meate, so long as vntill they be fat, for after that they will eurie day leane some of their meate, not stirring out of their place, as though they were without feeling and power for to move; in such manner as that through the great height of fatnes they are growne vnto, and the thickness therewithal, myse sometimes make their nests vpon their backs and yet they not feel them, for they are sometimes seene to heap such quantities of fat vpon the live flesh, as that there are some hogs found a foot and a half thick of lard."

It will be gathered, from the above remarks, that convenience, warmth, and the greatest possible freedom from moisture, are essential requisites in the construction of a sty. As to its form, various opinions have been entertained, and this must be determined by the circumstances of the farm, and its position as to other buildings. "As a general rule, in buildings," says a writer, "a circle will take the least stuff, and a square the next less quantity, and parallelogram more than either. For instance, a circle twenty-three feet in diameter, will require nearly sixty-three feet of fence or boards to enclose it. A square, twenty feet each way, will require eighty feet; this will contain a little more area than the circle; but a parallelogram, which shall contain as much area as the square,

(400 feet,) say forty feet long and ten feet wide, will require one hundred feet to enclose it.

“A circle is somewhat difficult to construct, but a square is very easy. Suppose you erect a building twenty feet square, and have your pens on the outside; three of the sides will give you space enough to accommodate and feed thirty swine. You can have your wood, steamers, boilers and vats in the twenty foot room, and feed them all, without going out of the room, by having a lid or trap-door to lift up, and give you a chance to the troughs. If you can have it placed on the side of a hill where water can be obtained easily, and have a cellar dug into the hill, the floor of which should be on a level with the floor of your boiling room, it will be very convenient; but if not, a cellar below may be made in the usual manner, and granary in the chamber above.”

“The sty,” remarks a writer in the Cabinet Farmer,* “should be proportioned to the number of swine it is to contain. One of sixteen feet by twelve, is probably sufficient for eight fattening swine. It should be divided into two apartments; that in the rear, which should be about six feet wide, should be dry and warm for the hogs to lie in. The front part of the sty, which would then be about ten feet wide, should have the floor descending on one side for the filth to run off, and on this side should be an opening. The trough should be on the upper side, covered with one or more lids, and upright fences should be set before it at such

* Vol. i. p. 218.

distances apart, as that one hog only could put his head between any two of them, in order that, while feeding, the weaker animals should be protected against the stronger. The whole should be covered with a roof, for it is essential that they be protected from storms while they are in the outer or feeding apartment. According to the foregoing, if sixteen hogs are to be kept or fatted in the sty, it should be thirty-two feet long and twelve wide, and in that case there might be a sleeping apartment at each end. These apartments should again be subdivided, that for the quiet of the animals, particularly in fattening, too many may not be forced to be together. It would probably be best also to divide the feeding apartment. Posts should also be set up in the sty for the hogs to rub themselves. If thirty-two hogs are to be kept or fatted, then perhaps the better way is to have two styes of the dimensions last described, placed together, with a roof over the whole, and a passage between them for the purpose of carrying food to the trough. If a part of the roof extended considerably beyond the sty, it would afford a convenient cover, for forming a heap of compost from the dung of the swine."

Particular attention should be paid to the construction and arrangement of the trough, in order to secure the least possible waste of food, and prevent continual quarreling among the animals. To effect this object, various contrivances have been adopted. Some have recommended "witches," or sliding boards before the meat, so placed as to yield to the snout of

the pig, admitting him to his food, and closing immediately on the withdrawal of the head. Others recommend that the only access to his food, allowed each hog, should be between two bars, sufficiently distant from each other to admit the head with a small portion of the necks. It is advisable however, if this method is employed, to fasten only the lower ends of the bars by pins, on which they can be turned; thus allowing the upper ends, during the process of feeding, to be moved as far as may be necessary, graduating in this manner the aperture to the size of different animals. A preferable method, it is believed, would be to divide the eating apartment of each sty into as many stalls as there are pigs, thus securing a place for every animal where he could obtain his food in quiet. This arrangement in small styes, (those containing three or four hogs only, of nearly the same age and strength, are recommended,) could be effected at a small expense. Each stall should be formed barely large enough to admit a single occupant, and extend back sufficiently far to prevent his being crowded. Such stalls may be easily constructed, by short studs with rails between them, and should be about the same height as the hog. Where doors are used before the troughs, they might be arranged to open inward, and be firmly hooked to upright bars, in this way answering for partitions. But whatever mode may be adopted, the bars before the trough should never be omitted. Loudon, in his valuable Encyclopedia of Architecture, recommends the con-

struction of a swinging door before the main entrance of each sty. "The use of the swing door," he remarks, "which is nothing more than a frame of boards suspended from a rail, the ends of which move in sockets freely either way between the jambs of the door, is to prevent the door from being left open in severe weather. When the pig wishes to go out, he soon learns to push it before him; and the same when he wishes to return."

In a compilation from the papers of the late Thomas Hale, Esq.,* a singular mode of feeding grain to hogs in such a manner as to prevent waste, is mentioned. The contrivance, however, is not adapted to liquid food. In order to avoid unnecessary expenditure of food and the labor of constant attendance, the farmers of Oxfordshire, "place over the sty a vessel like the hopper of a mill, and into this put as much beans and peas, or other dry food, as will fatten a number of hogs. From this there comes a large square pipe, half way down the sty, through which the food continually descends out of the hopper. The pipe terminates at that distance in six smaller pipes, each of which ends in a little trough no bigger than just to admit the nose of the hog, and they come all of them with their ends so near the bottom, that there is never above a handful of food at a time in each trough. When this is taken away by the eating of the hog, there follows so much more. This prevents their wasting their meal, at the same time that they have a constant sup-

* Page 64—65, Second Edition, London, 1758.

ply; and if it happen, for the convenience of the place, that a small current of water can be brought through the sty, they will in this manner be fattened with less trouble.

When a continuous trough is placed before a long range of styes, it should be made very slightly shelving, so that water poured in at one end, will find its way through, clearing out all filth and sediment. Cleanliness of the pens and fixtures should never be omitted, and will amply repay a suitable attention.

For the purpose of confining each animal to his proper place, admitting his mouth alone to the food placed before him, perhaps the following contrivance may be effectual.

TROUGH.

One half of the trough is covered over by a board, in which notches are cut sufficiently large to admit the neck of a single hog; the whole trough is made somewhat shelving along the sides *a b*, so that the line *a a*, is somewhat higher than the line *b b*. The half in which the notches are inserted is the part within the pen. The uncovered portion projects

beyond the sty into the passage (or in cases where simple yard enclosures are used, under a fence,) in order to receive the swill. The space allowed each animal should be divided as at *d*, and be made lowest at *c*, in order that the food may continually be found beneath the notches. Sliding divisions are preferable, which can be removed at pleasure, when the trough needs cleansing.

In Reese's Encyclopedia, a practice is mentioned as introduced by Mr. Patterson, of fattening large hogs in separate stalls. Subsequent experiment has borne ample testimony to the advantage of this method. It is found that pigs confined in this manner, fatten with great rapidity, while the process of feeding is far more cleanly. So confident was Mr. Patterson of the superiority of this method over all others, that he was ready to engage a pig, weighing at the commencement of the experiment 70 lbs. should in twenty-eight days increase to 140 lbs. "Seventy pounds live weight," adds the writer, may be called forty-five pounds dead, which at 8d. per pound is 30s. or 7s. 6d a week.* In the same volume, (title, pig case,) we are informed that stalls of this kind have been constructed on wheels, allowing the removal of the animal to different portions of a field, for the more equable distribution of his manure. The preferable mode, however, is to have a range of these pens under the same roof, as represented in the following cut, copied from the "British Husbandry."

* Reese's Encyclopedia, article Swine.

STALL PENS.

Each pen, represented above, is built to fit the animal, with considerable exactness, and, in some cases, is designedly made so narrow, as never to admit his turning round, though allowing sufficient room for lying down. Each stall inclines from the head to the tail of the animal, and is cleaned out daily. No litter of any kind is permitted, and holes are bored in the floor to allow all moisture to escape.

At one end of each stall is placed the trough, while the other contains a door, for the admission of the hog. In the above cut, the lid of the trough is thrown up, and the animals are represented feeding.

The erection of large piggeries has not been carried in the country to any great extent. In many parts of the Union, the animals are still allowed to run at large until near the time of preparing them for market, when they are turned into enclosures to be fattened. This method is generally adopted in the western

states, where swine are indulged in an extensive range, subsisting on mast and other articles of food abounding in the forest, until the approach of the "slaughtering season" renders them objects of the more immediate care and attendance of the owner. At this period, the practice of turning them into small fields of corn, divided for the purpose, and removing them to others as the feed becomes exhausted, is often adopted,—a measure which, though sometimes advantageous, or at least excusable in that region of extraordinary fertility, and abundant crops, is still at variance with that economy in the preparation and administering of food, on which much of the profit of stock-raising must depend.

Where the number of swine raised is sufficient to warrant the expense, a building should be erected, containing, in addition to the pens, suitable apartments, and rooms, for keeping and preparing food, with a good cellar sufficient to contain such articles as exposure to the frost would injure. The building should, if practicable, contain a well, or be supplied with water from some neighboring springs, so introduced as to be easily conveyed to different apartments. The rooms designed for the storage of grain, should be constructed with a tight floor, and secured as far as possible from the intrusion of rats and other vermin; while that containing boilers and steaming apparatus, should be paved with brick, and the floor incline slightly from the centre to the sides, where the wash of the apartment can flow

and be conducted in a suitable channel to the manure vats of the pens.

The number of hogs which can be attended to by a single person in establishments of this kind, properly constructed, together with the great saving of time and labor, are indeed astonishing.

Those who consult neatness of appearance in buildings of this description, and are willing to incur the necessary expenditures, will find many valuable hints as to the construction of farm houses of all kinds in Loudon's valuable Encyclopedia of Cottage, Farm and Village Architecture. In Reese's Encyclopedia, also, may be found the description and plate of a commodious and well arranged piggery, erected by the Duke of Bedford. In Henderson's Treatise on Swine, the author furnishes a representation of the building constructed for his own stock, and recommends it highly to the public. Though adapted to growing stores—which need, in the opinion of the author, considerable room—it is, nevertheless, inferior to many recent structures of the kind, and fails to secure that close confinement requisite for expeditious and successful fattening. Plans for houses of this kind have appeared in various American agricultural periodicals, and among others the following, which we extract from the Maine Farmer, as being economical and well adapted to the purposes proposed.

PLAN OF A PIGGERY.

This building is 36 feet long, and 22 feet wide, the roof shingled, and the walls made tight, by clapboarding. A sill passes lengthwise, under the building, and is designed to support the floor, which only extends to the rear of the sleeping and eating apartments. The other portion is divided into four vats, sunk to the depth of three feet in the ground, (as *aaa*,) into which all the rubbish, leached ashes, &c., that are made about the house, are thrown; and, by a spout from the sink in the kitchen, all the soap suds, and wash of the house, are carried out and deposited in a trough which is put up exactly level, and extends the whole length of the vats, and lets out an equal quantity into each. Muck weed and other materials are also collected and deposited in the vats. The remainder of the room, after taking out a passage three feet wide, is divided into pens for eating and sleeping. The floor to the former inclines six inches towards the vat, the more easily to drain off any filth that may collect upon it; but in the latter it is level. The partition between the passage, way and pens, and between the two pens, may be of any convenient height. The apartment for sleeping has a cover which may be raised or shut at pleasure, which keeps swine very warm in winter, and affords them proper ventilation in summer. A plank with cleats is placed, one end on the floor, and the other on the bottom of the vats, for the hogs to pass up and down on. On the side of the building, opposite the passages, are doors, 5 feet wide,

which open to the vats, with long glass windows over them, similar to the windows frequently placed over barn doors. There is an aperture in the partition between the pens, for the hogs to pass from one to the other, which may be apportioned to the size of the hogs to be kept in them. In one of the apartments there is a door that opens to the yard, for the purpose of giving free passage to young pigs, and sows that are about bringing forth their young.

A writer in the *Maine Farmer*, in commenting on this plan, remarks—and the suggestion is certainly valuable,—“We think that a building four feet wider than this might be made, and the floor of the pens, which, without injury, may be made one foot shorter, be allowed to run over the vats, which would give a space of nine feet on the other side of the passage way, in which may be a room to keep roots and other food for the swine, and another for boiling and steaming it.

In the *Cultivator*,* will be found an interesting account of the piggery in use at the Shaker Village, in Niskeuna, accompanied by a plate, sufficiently intelligible to render the construction of a similar one an easy matter. The mode of confining the pigs while at their food, by means of upright bars like those we have suggested, is exhibited in the plate. The chief advantage of this piggery seems to be, an arrangement by which the side walls of the

* Vol. 2, p.p. 70, 71.

rear portions of each pen can be thrown inward, like doors; in this manner confining the animals to the eating and sleeping apartments for a short time, while the manure is removed from the outer apartment. A lid is also placed before the troughs, which effectually shuts out the hogs, except at meal times. In the *American Farmer*,* will be found a description of a piggery on a very extensive scale, constructed by Nathaniel Ingersol, Esq., whose successful exertions in the rearing and treatment of swine are entitled to great commendation.

The piggery of Mr. Ingersol, is connected with the basement story of his barn, and contains apartments for boiling and steaming apparatus, pumps, bins for the storage of food, lofts for litter, &c. In connection with the pens, a yard is allowed for sucking pigs to run in, and the sows are occasionally admitted to the barn-yard (35 feet by 57) where they are fed from troughs constructed for the purpose. A reference to Mr. Ingersol's plan, will be found extremely useful for those who contemplate the erections of pens on an extended scale.

The piggery of E. Phinney, Esq., of Lexington, near Boston, has been much praised, as one combining economy and utility in a high degree. The following figure presents a plan sufficiently intelligible to render the construction of a similar establishment an easy matter to the farmer.

*See, also, *Farmer's Register*, Vol. 7, p. 37.

PLAN OF THE FLOOR OF THE UPPER STORY.

SIDE VIEW.

“The roof covers the passage way and eating and sleeping apartments on each side, and is made sufficiently high to enable the feeder to pass between the pens. The floors of the eating and sleeping apartments are made perfectly tight—the floor in the promenade in the upper story, is laid with narrow plank, placed about one inch apart, so that whatever is dropped by the pigs, falls through on the compost beneath. The promenade of the lower story has no floor. The only passage for passing the pigs out and in, is by a slide door between each dormitory and the main passage way. The pens being on ground which is a little higher at the end where the boilers are placed than at the other; the floor of the boiler room is on a level with the passage way of the upper story, where the pigs kept in this part of the building are taken in and out. At the other end of the building, the floor of the passage way in the lower story is on a level with the natural surface of the ground, and by a door at

that end of the passage way, the hogs in the lower story are taken in and out. You will perceive that a pen 100 feet long and 34 wide, with 3 in a pen, will furnish ample accommodations for 120 hogs. A passage way for the feeder is made from the cooking room to the passage way in the lower story.

The lower story corresponds with the upper, except that the promenade is extended out about six feet from the line of the upper outside promenade line.”*

In all well constructed piggeries, there should be several strong and commodious pens for boars, when in use, with openings into small enclosures, where the sow may be admitted.

The styes designed for sows while nursing their young, should, also, open into small yards, for the purpose of avoiding too close confinement of the animal while in that condition.

The value of the urine of animals as manure has been mentioned in a previous portion of this chapter. For the purpose of securing that of the hog, which is abundant, and where he is properly fed extremely rich, it is suggested that the floors of the eating and sleeping apartments should be made tight, and instead of inclining from the head to the tail of the animal, as represented in the former plans, should be made shelving from the rear to the front portion of the pen, in such manner as to cause the urine to flow into a paved gutter, beneath the trough.

*Vide, New England Farmer, Vol. 18, No. 70, 71.

It can then be conducted to a vat or cask at one end of the piggery. This mode will facilitate the application of the urine in its recent state ; a point of great importance where its greatest benefits are desired. Into the gutter, also, may be conveyed the washing of the troughs. Where this mode is adopted, the inclination of the floors should be just sufficient to cause a flow of the urine towards the gutter, without being so shelving as to impede the easy removal of the dung occasionally dropped in these apartments. In this way all of the urine, except that voided by the animals while in the space allowed as promenades, would be immediately secured. The paved gutter should also incline very slightly the whole length of the piggery, and a pump be placed near the highest end, so arranged as to pass water, when desirable, both through the gutter and trough above.

We have been permitted to examine the plan of a piggery now in process of construction by the Hon. H. L. Ellsworth, of the city of Washington. The building is 75 feet long, and 16 feet wide ; and is planned upon the most economical scale, adapted equally to those of large or slender means. It can be erected by a settler in a new country, without any other tools than the axe, the auger and the saw. This piggery combines several advantages, especially in the mode of feeding swine.

Fifty feet of the seventy-five are devoted to pens, arranged five feet deep on each side of a passage six feet wide. Each pen is designed to accommodate three hogs, and con-

tains a dormitory and eating apartment, each five feet square, and both sloping towards the outer side of the building, to manure vats, two feet deep and eight feet wide.

The troughs are formed by the union of two boards (seven inches wide) at right angles, like the letter V, and extend from one end of the building to the other, and are so arranged as to receive water easily from a pump.

The eating apartments are divided into stalls adapted to the number of animals, and each hog is confined to his separate stall in such a manner that his body must remain at right angles to the trough. The head of each hog is admitted to the trough through two upright bars, of suitable width, and directly below a board, which is scolloped out so as to fit the neck. This board can be easily raised by the hog, as it moves in a groove up and down. In this manner the feet of the animals are kept out of the trough.

Each pig may be confined to his stall while eating by a sliding door, or bars behind, if he shows a disposition to be unruly or to interfere with his neighbors.

The trough, in order to separate each one's portion and prevent trough-fights, is sub-divided in a very simple manner, while the location of these sub-divisions, and accompanying fixtures, prevent the pigs from crowding their food over the sides of the trough.

This sub-division is effected by sawing out small pieces of wood, which should exactly fit the trough, at the proposed places of division,

and nailing these pieces to a narrow strip of about 3 inches wide, and of the necessary height, which strip is then attached to the outer side of the trough by leather hinges. By raising this strip the divisions are all turned up out of the troughs; and to prevent its being so raised by the snout of the hog while feeding, a pin can be inserted, or a slight stanchion be dropped perpendicular, from the upper part of the pen.

The dormitory and eating apartments are connected by a swing door, which moves freely in sockets, and can be opened by the hog passing either way, closing again by its own gravity.

If sows with small pigs are confined, a partition should be made for the latter along the side of the dormitory, towards the trough, where they can enter by a small door, and be fed from the common trough with such provisions as are suited to their age and condition.

The space of six feet wide, running the whole length of the building, should be paved, and a small gutter left under the troughs; and in case any food is dropped, small pigs, as scavengers, can be admitted to consume it, or it can be swept out and disposed of in some other way.

A roof covers the 16 feet, containing the passage and pens, which can be extended, also, over the vats, if it is deemed desirable, at a small additional expense. The inclination of the floor renders it easy to shove the manure and litter from the pens into the vats, by pass-

ing along the passage with a board fixed at right angles, to a handle of 7 or 8 feet in length.

Fifty feet, in length, of the building, when divided, give 10 pens, 5 by 10 feet each. The outside of the pens are 3 1-2 feet high, and the roof should ascend in such a manner as to afford an easy passage to the feeder.

The roof over the remaining 25 feet, is made still higher, to accommodate a horse-power boiler and cutting machine, together with a corn and cob crusher. The boiler is so arranged as to steam or boil food as may be desirable.

A structure of this kind can be easily made in the western country, by placing posts, with notches, for the outside and inner side of the pen. Poles placed lengthwise on these notches, are sufficient to sustain roof boards or rails, and, where the latter are used, water can be kept out by covering the spaces between the rails with thatch or straw; while the floor may be made of logs, split and laid down with the flat side uppermost. Straight rails, fastened with wooden pins to the post, answer instead of side boards for partitions.

By procuring a "pin maker," (a steel plate with a hole sufficiently large, through which a small piece of wood is driven, so as to form a pin,) and a "bit" of corresponding size, a fence or partition may be made with great economy.

We would mention here, that Mr. Ellsworth, for whom the above piggery is now constructing, is endeavoring to collect the best breeds of swine in Europe and this country; with the design of still farther improving pres-

ent varieties, as well as instituting experiments as to different articles of food.

In the front part of this volume, will be found figures, which we trust will convey sufficiently accurate information of the plan proposed.

Fig. 1. EXHIBITS A GROUND PLAN.

- A A. Passage 50 feet long and 6 feet wide.
- B B. Eating rooms, 5 feet by 6, divided into stalls.
- C C. Dormitory, 5 feet by 6.
- D D. Manure vats, 10 feet by 8.
- E E. Trough.
- F F. Slope of vat.
- G G. Steaming apparatus.
- H. Hot water or steam tube.
- I. Boiler.
- K. Small hose fitted to pump.
- L. Pump.
- M. Horse power.
- N. Corn sheller.
- O. Straw cutter.
- P P. Paved gutter beneath troughs.
- S S. Rear portion of pen.

The steaming apartment is 25 feet long and 18 broad.

Fig. 2. SIDE ELEVATION, AS SEEN ONE SIDE OF THE PASSAGE.

- A A. Eating rooms, 5 feet by 6.
- B B. Dormitory, 5 feet by 6.
- C C C. Rooms for steaming apparatus, &c.

- D D D. Boards, sliding up and down, to confine the head of hogs when at the trough.
 E. Door opening from dormitory.
 F. Pump.

Fig. 3. SECTION THROUGH X IN Fig. 1.

- A. Door to passage, 6 feet wide.
 B B. Trough.
 C C. Manure vats, 8 feet wide and 2 deep.

The roof is 9 feet high, and there is a slope of 1 inch to the foot from the trough to the manure vats.

FIG. 4.

Top view of the trough, with the hinged board, which, when opened, forms divisions in the same—and also, (E) an end view, with dotted lines, showing the manner in which the divisions fit into the trough.

In addition to the construction of comfortable pens, it should be constantly borne in mind, that much of the profit of raising hogs depends on regular and systematic feeding. The animal should be supplied with stated quantities of food, and at regular intervals. And to no one who is unwilling to descend to minute particulars, should the management of an extensive piggery be intrusted. Inattention to the precise quantity of food given, besides deranging the accuracy of experiment, creates also unnecessary waste. A few lessons will teach the animals to assemble in their feeding apartments upon a given signal, and thus economize the time and labor of the feeder. Let

those, therefore, who are placed over establishments of this kind be instructed to feed a particular amount at a particular time (three meals a day, unless for young pigs, is sufficient) and let the last feeding be given sufficiently early to leave the animals at rest after sundown.

Experience will ultimately teach, and it may be by bitter lessons, the necessity of attending to those particulars which are generally deemed unimportant. On regular and systematic feeding, says one of the most judicious agriculturalists of our country,* and clean and dry bedding, the success of rearing and fattening swine very much depends. To these, a faithful feeder who has some skill and taste, and, in short, a little pride of vocation, is indispensable. Much of the fame of Ulysses of old for raising the best breeds of swine was to be attributed to his faithful Umeus, whom he styled (dios subotes) his god-like swine feeder.

*Elias Phinney, Esq.

CHAPTER IV.

On the comparative advantage of raw and prepared food for swine—Interesting researches of French chemists on this subject—The necessity of some preparation evident from the experiment of M. M. Biot and Raspail—Fermented food—Boiling and steaming food—Results of various experiments in Europe and this country—Cuts, and description of boiling and steam apparatus.

Few branches of agricultural science have seemed to demand more investigation, or have been pursued, during the few past years, to a greater extent, than that relating to the best mode of preparing and administering the food of animals. The aid of chemistry, with its minute investigations, has been summoned to determine the nutritive qualities of diverse articles employed for the sustenance of stock; while, guided by the data thus obtained, experiment after experiment has accumulated the most valuable results. It is indeed interesting, while examining the pages of various agricultural periodicals—those faithful chronicles, when well conducted, of the true condition, at given periods, of the science they support—to trace the changes which short intervals are effecting in all farming operations; to behold the favorite theories of past years condemned in the better practice of the present, and to hope, amid the extinction of long cherished prejudices and the hourly diffusion of intelligence, that agriculture, one of the most honorable pursuits of man,

will rapidly attain its proper elevation. It is the duty, as it is the privilege of the farmer, to avail himself of the light thus furnished, and advance with the age in which he lives. There is nothing regarding the pursuit which he has chosen too minute to be worthy of attention. It is the constant observation of "small matters," which the many pass as unimportant, and the daily endeavor to make the most of every article produced, that renders him a more judicious and successful cultivator than his neighbor.

The economy of food! To consult the pages of the periodicals to which we have alluded, one would be induced to consider the subject as almost exhausted; but, judging by the practice of their readers—those most interested in the matter we should naturally conclude—the whole doctrine was a new one. And yet, on the economy in the preparation and distribution of his food, is the farmer to rely for the comfort and rapid increase of his animals. To him, the questions whether food should be given in a natural or prepared state, simple or mixed, fermented or unfermented, together with the comparative advantage of grinding, steaming, or boiling, are points of great importance.

That the digestion of animals is not ordinarily sufficient to derive nutriment from the whole of the food administered, is evident from the fact that kernels of grain are frequently voided with the natural passages, so entirely unchanged as to be capable of subsequent germination. So well aware are many of this fact,

that they allow their swine to follow large droves of horses, to gather the unchanged grain thus voided. It is also ascertained that the power of digestion and assimilation acts with greater energy on some materials of food than others, and that regard is always to be paid to the nature of the substance through which the nutritive matter is diffused. Many substances containing an equal quantity of this matter, differ much in their power of producing a rapid increase of flesh. Experiment has shown, for instance, that succulent vegetables fatten oxen faster than the same amount of nutriment would do in an equal mass of dry food. Much interesting information on these subjects, will be found in the details of accurate investigations as to the quantity of nutritive matter contained in different articles of food, in the *Agricultural Chemistry* of Sir Humphrey Davy, and in Sinclair's treatise on the cereal grasses.

The critical investigations of the French chemists, Dutrochet and Dumas, and especially of Raspail and M. Biot, have thrown much light on the subject of preparing food for animals. The experiments of the latter prove conclusively, that some preparation, in all cases, is requisite to obtain the greatest quantity of nutritive matter. In the *London Quarterly Journal of Agriculture*, will be found a highly interesting article, exhibiting the various experiments of Raspail and M. Biot. It is the results of these experiments that we desire to place before our readers, and notwithstanding the great length of the article which contains them, we

Trust our readers will find in the principles established an excuse for our extracting largely. "M. Raspail, from numerous experiments, concludes that each grain of fecula is an organized globule, formed in the interior of living vegetable cells, such as in those of a grain of wheat, or of the tuber of a potato; that the enveloping membrane of the kernel is incapable of being dissolved in cold water, spirits of wine, ether, or the acids, but expands in proportion to the degree of heat, and in boiling water bursts on one side of the globule; and that, after boiling in a large quantity of water, the burst and detached envelops fall to the bottom in the form of snow-white flakes, leaving the liquid above them as limpid as water." Further experiments induced M. Raspail to assert that the kernels in the envelop strongly resembled gum, if not identical with it, in physical and chemical character. At this stage of the inquiry, however, M. Biot, along with M. Peroz, took up the subject, and succeeded in discovering a distinct and very remarkable difference from gum. Accordingly, on isolating the kernel portion of a parsnip-root, by boiling to burst the envelop, precipitating by alcohol, purifying by repeated washings with alcohol, and then dissolving in water in order to observe in what manner it polarized light, it was found that it turned the plane of polarization with more energy towards the right than any substance yet known, while all gums, and the sugar of grapes, turn the planes of polarization towards the left. Cane sugar, indeed, turns

the plane of polarization towards the right, but not with the same energy as the kernels of starch. The latter, therefore, M. M. Biot and Peroz term dextrine. The soluble portion, accordingly, of starch, or the farinaceous matter of grain and roots, is dextrine, which is always contained in a globular envelop, composed of membranes that are incapable of being dissolved in water, even when boiling. By means of this singular and unexpected test of turning the planes of polarization towards the right of the observer, the nutritive qualities of all vegetable substances can be examined, and many of them have been so examined by M. Biot. Among other vegetable productions M. Biot examined the juice of the carrot, taken from the white variety by cold pressure. He divided this into two parts, one part being filtered through white paper without being heated, and the other, after being similarly filtered, was brought, for an instance, to the boiling point. The result was most important in a philosophical point of view; the part which had been brought to a boiling temperature, produced a rotation towards the right, exactly double of that which had not been heated."

"The liquor, continues M. Biot, treated with alcohol, gave a considerable precipitate, which was instantly re-dissolved in water, as is the case with dextrine, and this appears to explain sufficiently the sudden increase of the rotation after boiling." It will follow that even a slight boiling doubles the nutritive value of carrots, a fact known indeed from other experiments, but

only in a vague manner without any philosophical data to explain it by.

When immersed in water at 122 degrees, the envelop, which is unaffected by colder water, expands, and in boiling water it bursts, while the kernel is dissolved in the water. Water, however, alone, as M. Raspail proved, and M. M. Biot and Peroz verified, will not completely rupture all the envelops of fecula, or at least extract all the dextrine unless the boiling is continued for a long time, with considerable quantities of water; because the unbroken globules of fecula are apt to be held together in clots by the gum-like matter disengaged from the broken ones, and in this manner are partly protected from the full influence of the heat.

The dextrine thus obtained is uniformly the same, being completely decomposable by heat, while it can be analyzed into water, hydrogen, and carbonic acid gas, but no nitrogen has been found in it.

In the article referred to, the size of the globules of different grains are given. Those which contain the dextrine of the potato are stated as varying from the 4-10,000th to the 49-10,000th part of an inch in size, while those of the buckwheat seldom appear so large as the 44-10,000 part of an inch. The facts derived from these minute experiments, and which we wish particularly to place before our readers are the following:—

I. That the globules constituting meal, flour and starch, whether contained in grain or roots

are incapable of affording any nourishment as animal food till they are broken.

II. That no mechanical method of breaking or grinding is more than partially efficient.

III. That the most efficient method of breaking the globules is by heat, by fermentation, or by the chemical agency of acids or alkalies.

IV. That the dextrine, (the nutrient part,) which is the kernel, as it were, of each globule is alone soluble, and therefore alone nutritive.

V. That the shells of the globules, when reduced to fragments by mechanism or heat, are insoluble, and therefore not nutritive.

VI. That though the fragments of these shells are not nutritive they are indispensable to digestion, either from distending the stomach and bowels, or from some other cause not understood, it having been proved by experiment that concentrated nourishment, such as cane, sugar, essence of beef, and osmazone, cannot long sustain life without some mixture of coarse and less nutritive food.

VII. That the economical preparation of all food, containing globules of fecula, consists in perfectly breaking the shells, and rendering the dextrine contained in them soluble and digestible, while the fragments of shells are at the same time rendered more bulky, so as more readily to fill the stomach.*

A proper distention of the stomach seems to facilitate its digestive powers, a fact which should never be forgotten by those engaged in rearing stock. When aliment of extremely nutritive

* Vide Farmer's Register, vol. 5, p. 280.

kind is employed for the purpose of procuring rapid increase of flesh, there should also be a tolerably large admixture of that food on which the animal naturally subsists. In the experiment made by the French physiologist Magendie, we find that sugar, one of the most nutritive of all substances, did not possess the power alluded to, and consequently failed to arouse the digestive energies of the stomach, and the result of feeding a dog on white sugar and water was, that the animal became gradually emaciated and finally perished. It is this principle undoubtedly which explains the happy effects arising from mixed food, where, with substances containing the nutritive quality in a high degree, are united those more bulky and less suitable for nourishment. "An experiment has been made in England," says a correspondent of the Genessee Farmer "on the feeding of horses which demonstrates this fact most conclusively. Some country horses were selected and while one part of them received sugar and water alone, the other part had a few pounds of cut straw added to their portion of sugar and drink. Those which received the sugar alone fell away rapidly, while those fed with the sugar and straw thrived as perceptibly; and a repetition of the experiment on another set of animals showed the same result. In man, the rich and high seasoned food, the fine flour and the fat meat, are to the stomach what fine wheat or sugar would be to the stomach of the horse. There is much nutriment, but little that can facilitate digestion. The man who lives on com-

mon food, sound and sufficiently nutritious, is rarely troubled with the evils that press so heavily on him who, regardless of the law of nature, takes more nutriment and less substance than is consistent with a healthy tone of the digestive powers."

It is a common error that "hard" or unprepared food "makes the hardest meat"—a doctrine whose fallacy is shown by such experiments as those mentioned—for whatever the nature of the aliment, a similar process of digestion must be gone through, and the ultimate principle of nutrition—the chyle—is the same in all cases. In general the finer the particles of food administered, the easier will be the process of digestion, and the greater the quantity of nutritive matter furnished. It is those individuals whose digestive powers are weakened that find benefit from thorough mastication. In regard to the feeding and fattening of animals this principle is one of great importance, and inculcates the necessity of grinding or cooking the materials given them, if our object be their own condition or our interest. Attention to the proper admixture and fineness of food fed out to swine is particularly requisite, because these animals if once allowed to sink into a failing condition, can rarely be made to regain what they have lost.

Much has been said and written recently on the subject of giving fermented food to stock, and there are many who yet oppose the practice. The custom of the Germans in feeding their horses on bread that has been fermented until

slightly soured is generally known, and the economy of the procedure is supported by all experimenters. The bread, too, in general use among the people of that country, is that in which acetous fermentation has nearly taken place, and is said to be more nutritive and wholesome than unleavened bread. And the same result would undoubtedly attend a similar preparation of all farinaceous food given to animals. The process of fermentation materially aids that of digestion. A correspondent of the *Maine Farmer* gives the following satisfactory explanation of the advantages to be derived from fermented swill in feeding swine. "Vegetable substances contain a large quantity of carbon, and this same substance enters also largely into animal materials, especially into fats and oils constituting a large portion of these substances. It follows, therefore, that in animals, by the process called digestion, a portion of this carbon of the food is separated and assimilated or converted into chyle or blood, and from these into fat, muscle, or flesh, and such like materials which make up the animal body. But before the digestive powers can do this, the food must undergo a change, and the carbon contained in it be combined with something that will render it easily dissolved in the fluids of the body. Solid carbon is not dissolved in fluids. Charcoal which is one form of carbon, and indeed is nearly pure carbon, we all know is not soluble in fluids but still it may be dissolved by adding another substance to it.

To go back to our first remark, that vegetable

substances such as are used for food contain a large portion of carbon, not in a pure state, to be sure, but mingled with many other substances which render it more or less liable to undergo fermentation. Now what is fermentation? It is nothing more nor less than this carbon combining with the oxygen of the air or atmosphere, being converted into air and escaping in the form of bubbles of gas as it takes its way up through the mass. The swill, therefore, that is in this state is ready to be dissolved in the fluids of the stomach and converted to the animal body. If it is not fermented it will not digest so soon, and of course is not changed to fat so soon, and consequently the hog does not fatten so fast."

It is rather the excess of fermentation in the food furnished to his stock that the farmer has to guard against. This process is divided into four stages, the saccharine, the vinous, the acetous and the putrefactive. We have an exhibition of the first in the malting of barley, which is made sweet by the process; of the second in the working of cider and beer; of the third in the souring of bread and the production of vinegar; while the last is manifest in the decomposition of bodies. But a short distance into the third stage, and never beyond it, should the fermentation of food designed for animals be suffered to proceed. "In order" says a writer in the *Farmer's Cabinet** "more effectually to accomplish the object in preparing food for hogs, two tubs should be procured of such size as are adapted to

* Vide *Farmer's Cabinet*, vol. 3, p. 86.

the number to be fed, in which to prepare their food ; these should be used to feed from alternately ; the materials in the one would be undergoing the necessary preparation while feeding from the other. The weather being generally cool while hogs are fattening, the process of fermentation progresses slowly, and if it is very cold is entirely suspended, unless artificial means are resorted to keep it up. Pieces of stale or mouldy bread that are no longer fit for family use, and which find their way into the swill tub, are uniformly found to put the whole contents into a state of fermentation, if suffered to remain for a few hours. This has suggested the opinion that a small quantity of yeast, which is a cheap article, might with advantage be added to the contents of the tub, containing food for swine, in order more quickly and thoroughly to bring it into a complete state of fermentation and advance it to slight acidity before it was fed. This addition need not often be made, provided the tub is replenished with food before it is quite emptied of its fermented contents, and in this way it could be kept up during the feeding season. Corn or other grain that has been well steamed, boiled, or well soaked, is very susceptible of the influence of yeast. Starch makers and distillers use it in order to prepare the grain so that they can extract their respective articles of manufacture from it with more facility and in greater quantities ; and it appears reasonable to suppose that the stomach of animals would have their labor abridged, and would be enabled to extract a greater quantity of nutriment from a

given quantity of grain or vegetable matter thus prepared, than when it is fed to them in the usual way."

The mode preferred in the estimates of Mr. Young for converting any kind of corn into food for swine, consists in grinding it into meal and mixing the product with water in cisterns, in the proportion of five bushels of meal to one hundred gallons of water; this must be well stirred several times in the day for a fortnight, during warm weather, and for three weeks when colder, at the expiration of which time it will have become fermented.*

The practice of boiling or steaming the food of animals seems to possess advantages attending few other modes of preparation—and the experiments of M. M. Raspail and Bit, to which we have alluded in the foregoing portion of this chapter, sufficiently explain the reason. We are taught, however, by the results of their investigation, that boiling, when resorted to, should be continued for a long time, and with considerable quantities of water, and that steam when employed, should be only used at a high temperature. Long before the researches of these able chemists, another French philosopher, M. Reaumer, had exhibited the results of boiling grain, while endeavoring to assign a more philosophical reason for the advantage attained by this process than the vague assertions of popular opinions. For this purpose he caused about 4 measures (each 1 1-3 pints English,) of each of the six common sorts of grain

* Vide Complete Grazier, p. 184.

to be boiled until they were well burst, (which may be fairly taken to mean, that two thirds of the dextrine was set free,) and he found that the increase of bulk in each sort, was as follows:—

Four measures of oats, after being boiled to bursting, filled 7 measures.

Four measures of barley, being boiled to bursting, filled 10 measures.

Four measures of buck-wheat, after being boiled to bursting, filled 14 measures.

Four measures of maize, after being boiled to bursting, filled above 13 measures.

Four measures of wheat, after being boiled to bursting, filled little more than 10 measures.

Four measures of rye, after being boiled to bursting, filled nearly 15 measures.

In order to ascertain whether the boiling altered the preference of poultry for any of the particular sorts, M. Reaumer, made numerous experiments, varied in almost every possible way. And, again, other experiments to test the economy of feeding with boiled grain. In regard to the first point, the result showed a relish in general for boiled grain, though no permanent preference for any one sort was discovered, and again proved that there is, in most cases, a considerable saving by feeding with boiled grain. The animals selected by Reaumer, were poultry, possessing, as is well known, remarkably strong powers of digestion, and consequently requiring in general less preparation of their food, in order to extract its

nutritive qualities. Another important fact was exhibited in the course of these experiments, that some of the articles employed, though greatly increased in bulk by boiling, did not tend to the nourishment of the animals as much as the original quantity would have done in its raw state. In these cases, the food in its prepared state was better relished, and consumed to a much greater extent—thus, over-loading the stomach, and causing, by excess of nutriment, the same effect as those attending the experiment of feeding horses on sugar and water, to which we have alluded; and as in that case, so in this, a due admixture of less nutritive food, would probably have changed the whole result. We are induced to believe, that it is to inattention of the facts—that the power of digestion varies to a great extent in different animals, and that some articles may be made to afford so much nutriment, as to give different results from those anticipated—that such various opinions are entertained of the economy of boiling or steaming the food of animals. It does not follow, that because the feeding of boiled food to one animal is found economical, that the same saving will result from a like course towards another, whose digestive powers are stronger. In the latter case, so little perceptible assistance would be rendered to the strong digestion of the animal, as to prove the process attended with hardly any saving of expense,—indeed, with a considerable loss. The gizzards of fowls possess sufficient power, as proved by the experiments of Spall-

anzani, to crush oats and barley, and reduce glass to powder, while these former substances if they escape the proper bruising from the teeth, not unfrequently pass through the stomachs of horses in an unchanged state.

We have indulged in these remarks, because, in the experiments made by order of the Highland Society of Scotland, the result seemed to be, that any advantage gained by administering boiled or steamed food to ruminating animals, was counter-balanced by increased expense attending the proceeding—and from this result an argument has occasionally been drawn in general, against these modes of preparation. The failure of a few experiments on a particular class of animals, when added to the indifference or aversion which often attends the promulgation of new doctrines and discoveries may, and sometimes does, retard the progress of important agricultural truths. But the results attending the experiments of the Highland society were, as we conceive, not as conclusive as has been supposed. A writer in the *Quarterly Journal of Agriculture*,* while remarking on the extreme difficulty of selecting cattle for such experiments, thus continues:—“That cattle consume food something nearly in proportion to their weights we have very little doubt, provided they have previously been fed in the same manner, and are nearly alike in condition. Age, sex, and kind, have little influence in this respect, as the quantity of food consumed depends much on the length of time the

* Vide June No., 1837.

beast has been fed, and on the degree of maturity at which the animal has arrived; hence the great difficulty of selecting cattle fit for experimenting upon. To explain our meaning by an example, we would say that two cattle of the same weight, and which had been previously kept for a considerable time on similar food would consume the same quantity. But on the contrary should two beasts of the same weight be taken, the one fat and the other lean, the lean beast would eat twice, or perhaps thrice, as many turneps as the fat one, more especially if the fat one had been for some time previously fed on the same food, as cattle eat gradually less food as they arrive at maturity, when they become stationary in their appetite." Allowing now that, notwithstanding these difficulties, as exhibited by the above writer, (himself a distinguished experimenter on these subjects,*) the animals designed to test the question were selected sufficiently equal to each other, there is still some doubt remaining as to the after course of treatment. Ten animals were selected by Mr. Walker of Ferrygate, to whom the premium for experiments on horned cattle was adjudged, as nearly equal as possible in point of weight and feeding qualities. These animals were selected from a lot that had been in full keeping for some time previous, and were fed during the trial with food (except the addition of potatoes) similar to that they had used before the experiment. The main substance admin-

* Vide Robt. Stephenson Whitlaw, Haddington, Transactions of the Highland Society of Scotland, vol. 10, p. 253.

istered as food was turneps, an article easily masticated and which needed not, to so great an extent, the application of the boiling or steaming process to develop its nutritive quality; an article in regard to the feeding of which in its raw state, the writer from whom we last quoted remarks, "whoever feeds cattle on turneps alone will have no reason, on the score of profit, to regret not having employed more expensive auxiliaries. Now if the conclusions of M. Raspail and Biot are just, and if the testimony of other experimenters can be taken, the chief value of the boiling or steaming process is, that it so develops the nutritive qualities of food, that the same quantity, when thus prepared, goes farther, certainly as far, in the production of flesh as it would in a raw state; indeed that a less quantity is often found more nourishing after this preparation, than a greater one without it. We should therefore naturally suppose that any one anxious to test the comparative advantages of steamed and raw food, would confine himself to the same quantity or quality at every feeding, or that if there was any difference, it should be in a lessened amount of that designed for steaming. But the experiments of Mr. Walker were not conducted on this principle, for he says "we soon discovered that the cattle on the steamed food consumed considerably more turneps than those on the raw food," and again informs us, that the difference in this respect was as great as 55 lbs. of turneps per day for each beast.

Now, as the cattle using the raw food did well

and fattened easily, this difference proves one of two things, either that those fed on steamed food had too much nutriment daily, or that there was something in the process of steaming which abstracted so much of the nutritive matter, that the addition of 55 lbs. more each day could but little more than make good the loss. Mr. Walker seems to have overlooked the fact, that the process of steaming might render the food given more palatable to the animals, and thus cause them to take an excess of nutriment which would ultimately defeat the objects aimed at. The increased quantity of steamed food, certainly was not given from any conviction that it was necessary, for Mr. Walker says that an equal quantity was originally laid aside for all the animals, and that after the fattening process had gone on to a considerable extent, he discovered, from the decreased size of the heap, "that very few turneps were left to put into the steam tub, while little more than half of those laid down for the raw food was consumed." This was a "discovery" which ought to have been made before, or rather ought never to have been made. It proves that turneps were steamed as fast, and to as great an extent as the cattle would consume them, and leads us to believe that the object was, as Mr. Walker expresses it, "to fatten both lots of cattle and afterwards calculate the different expense."

It is, indeed, asserted towards the conclusion of the report, that if less steamed food had been employed there would have been a great "short coming in the article of improvement," but suf-

ficient reasons for the statement are not given. The cattle fed on steamed food were probably forced, and overloaded from the commencement, and the result proved, what might have been expected, that Mr. Walker could not fatten animals economically on the too liberal quantity allowed them; but it does not prove that a less quantity would not have been sufficient. Nor does it afford any ground for the assertion that boiled food is not economical when fed to ruminating animals. The same experiment differently conducted, or trials as to other articles (corn for instance) more difficult of mastication, would, we have reason to believe, exhibit different results. The experiment made by John Boswell Esq.,* with a similar number of cattle, though substantiating to some extent the inference as to steamed food drawn by Mr. Walker, was conducted in a better manner. The food in this case was a mixture of red potatoes and yellow turneps. Mr. Boswell states that the number fed on raw food eat readily from the commencement; but that the others hardly tasted the steamed food for several days, exhibiting a jaded appearance. It appears however that "in a short time they all seemed to relish the prepared food as well as the raw, although it was a fortnight before they looked as full and well as the cattle fed on raw food; and the singular fact is mentioned, that the lot on raw food invariably finished their potatoes before one turnep was tasted, while the other invariably picked out the steamed turneps in preference to potatoes."

* Vide Transactions of the Highland Society of Scotland,

The experiment of Mr. Boswell, however, in respect to quantity of food consumed, differed from that of Mr. Walker, for we find that "both lots kept nearly alike, the only difference being that the lot on raw food consumed much more food than those on steamed." We should be gratified to see experiments of this nature conducted on the same method as that pursued by Mattheiw de Bombasles, and published in a work seldom met with in this country, entitled the "*Anals de Roville*." Says a writer in a foreign publication:—"The experiments usually made on this subject have been conducted upon the principle of continuing one species of food, such as hay or carrots, for a given time ; but M. de Bombasles, reflecting that it is neither natural nor agreeable to any animal to be confined for a length of time to the same species of food, adopted a different method. He separated into several groups the cattle on which he designed to experiment, and brought those in each group as nearly as possible to a given weight, by feeding them with an exactly weighed proportion of common articles of food, diversified to suit their taste. When he had proceeded so far, he then began to take away from their diversified food a known proportion of one of them such as lucerne hay (*luzerne seche*) replacing it by some sort of root, such as carrots, gradually increased or diminished, so that each individual in the group came up and sustained the weight it had stood at before the change. The comparison of the qualities thus ascertained by trial to be equivalent, gave the practical proportions of

their nutritive properties, under the conditions thus associated.

“These results thus obtained by M. De Bombasles, by trials with sheep, appeared to place carrots very far below the rank usually assigned them as food for sheep, by farmers on the continent, and even as food for horses when substituted for grain. But it is important to remark that M. De Bombasles gave the carrots in a raw state to his sheep, and consequently from their stomachs being unable in the process of digestion to cause the globules in the carrot containing the dextrine to burst, they derived little nutriment from a substance which is undoubtedly very nutritive when the dextrine is developed by boiling. The intelligent farmers in Belgium, who seem to be almost a century before other parts of Europe in improvement, never, it is said, give any roots to their live stock without boiling.”

But whatever may have been the facts regarding cattle, the experiments of the Highland Society on pigs, exhibit more cheering results. We put up to feed, says Mr. Walker, on the 4th March, 1833, five pigs on steamed potatoes with an allowance of $2\frac{1}{2}$ pounds of broken barley, each lot of the barley being steamed along with the potatoes. They were allowed the same quantity of potatoes, but from the circumstances of their being put up only two year old from the same brood, we were not able to keep so accurate an account of the quantity of potatoes consumed, because as they increased in size they

ate more potatoes. The following table will exhibit the improvement in pounds weight.

1833.		Weight in lbs.
March 4.	Live weight of five pigs on raw food,	} 108
	Ditto of 5 ditto steamed food,	
		106
	Difference in favor of raw food,	2
19.	Live weight of five pigs on steamed food,	} 114
	Ditto of 5 ditto on raw food,	
		111
	Difference in favor of steamed food,	3
30.	Live weight of five pigs on steamed food,	} 137
	Ditto of five ditto on raw food,	
		123½
	Difference in favor of steamed food,	13½
May 1.	Live weight of five pigs on steamed food,	} 250
	Ditto of 5 ditto on raw food,	
		220
	Difference in favor of steamed food,	30
June 1.	Live weight of five pigs on steamed food,	} 270
	Ditto of 5 ditto on raw food,	
		223
	Total difference in favor of steamed food,	47

In three months the pigs on steamed food had increased 137 lbs., being 47 lbs. more than double; while those on raw food had only increased 115 lbs., being 7 lbs. more than double their first weight; so that there can be very lit-

tle doubt that steamed food is more profitable for feeding hogs than raw food.*

Similar results attended the experiments of Mr. Boswell on these animals. "Being anxious that there should be no interference as to food, or any other circumstances, he preferred conducting this experiment apart from the other, and therefore on the 1st December, 1832, caused his overseer at Balmuto to put up ten pigs, all of one litter, in two lots, which by a little management he succeeded in getting exactly of the same weight, the lot to be put on raw food being 5 cwt. 2 qrs. 22 lbs.—the lot to be put on prepared food also 5 cwt. 2 qrs. 22 lbs. The food employed was sound red potatoes and the best oat meal. Those on raw food had the oatmeal given them in the shape of "crowdy" i. e. the oatmeal mixed up with a little cold water. The lot on prepared food had the potatoes boiled and the oatmeal made into common water porridge. From the very first, it was clear that the lot on prepared food were fast beating the others, and an increased quantity of oatmeal was given to the lot on raw, in order to make them ready for sale along with the others; yet still they were greatly deficient on the 1st of March, at which time, the experiment being concluded, they were put on prepared food, when they began instantly to make up the "lee way."

The five pigs put on boiled food weighed at the commencement, on the 1st December, 5 cwt. 2 qrs. 22 lbs., and at its termination on the

* Vide Transactions of the Highland Society of Scotland, vol. 10, p. 279.

1st March, 10 cwt. 1 qrs. 1 lb., while the five fed on raw food, weighed at these different periods, 5 cwt. 2 qrs. 22 lbs., and 8 cwt. 1 qr. 15 lbs., being a very decided difference in favor of those fed on prepared food.*

The advantage of feeding hogs on prepared food is also apparent from the report of W. Dudgeon, Esq., undertaken (as were the two former,) at the request of the Highland Society. The report and accompanying tables are of considerable length.

Mr. Dudgeon states, that he was well situated as to ventilating the apartments of the animals, that he allowed them "plenty of room, and separate divisions for feeding and exercise, as well as a place for repose after receiving their several quantum." These circumstances he considers of consequence in feeding these animals, for when kept dry, clean, and airy, they thrive and feel well on comparatively little food, as is exhibited by their respective weight, taken at different times. All the pigs were repeatedly washed with soap and water, which refreshed them greatly, and caused them to relish their food.

Examinations as to the condition of the animals was made every eight or ten days by Mr. Dudgeon, from July 2 to October 2, and his conclusion was that the lot fed exclusively on boiled meat, throve throughout in a superior manner to the others, even those who had an occasional mixture of raw and boiled meat, thus proving

* Vide Transactions Highland Society, &c. vol. 10, page 271.

that boiled meat is at all times more nutritive than the raw.*

Several extremely interesting experiments of this nature have been made in this country, by the Rev. H. Colman of Massachusetts, a gentleman to whom the science of Agriculture is indebted for many valuable contributions.

It is the general custom of our farmers, whatever may have been the articles employed in raising hogs, to finish the fattening process with corn, and the question which Mr. Colman solved in his experiments was, in what mode this food can be most profitably given. The result will be found in the Transactions of the Essex Agricultural Society, for 1835.

EXPERIMENT I.

Two hogs one year old, one of them a barrow in a very good condition, the other a barrow recently gelded and in ordinary condition, were put up to be fed exclusively upon Indian hasty-pudding, or Indian meal boiled with water. We began feeding the first of March, 1831, and weighed them again on the 19th of the same month. In the eighteen days they consumed six bushels of Indian meal. They were offered cold water to drink but did not incline to take any. The result—

No. 1 weighed on the 1st March,	233 lbs.
Do. do. do. 19th do.	269 "
Gain,	36 "

* Vide Transactions of the Highland Society of Scotland, vol. 10, p: 178.

No. 2, recently gelded,	weighed on the 1st	
of March,	- - -	190 lbs.
Do. do.	19th March,	247 "
Gain,	- - - -	<u>57</u> "

The gain of the two was 93 pounds in 18 days. The quantity of meal consumed by them was 10 quarts per day to the two. This allows 30 qts. to a bushel, deducting two for grinding. The price of corn at this time was 70 cents per bushel. The expense of the increased weight is 4.5 cents per pound.

March 21, 1831, killed the hog mentioned first in the foregoing experiment. Live weight, 273 lbs. Weight when dressed, 215 lbs. Loss in offal, loose fat included, 59 lbs., or little more than one fifth.

EXPERIMENT II.

No. 2, mentioned in the above,	weighed on	
the 23d March,	- - - -	253 lbs.
Do. 30th April,	- - -	312 "
Gain in 38 days,	- - -	<u>59</u> "

No. 3, a shoat purchased from a drove,	weigh-	
ed on 28th March,	- - -	100 lbs.
Do. 30th April,	- - -	151 "

Gain in 33 days,	- - -	<u>51</u> "
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This is a fraction over 1 lb. 8 oz. per day, each, nearly 1 lb. 9 oz.

In this case their food was exclusively boiled potatoes mashed with Indian meal. Exact amount consumed not ascertained, but fed as freely as they would bear.

EXPERIMENT III.

The two last named hogs, were, for the next twenty days, put upon Indian hasty-pudding exclusively, with the following result:—

No. 2, weighed on the 30th April,	312 lbs.
Do. do. 20th May,	382 "
Gain, in 20 days,	70 "

No. 3, weighed on 30th April,	151 lbs.
Do. do. 20th May,	185 "
Gain in 20 days,	34 "

The two, in the above named 20 days, consumed four and one half bushels of meal cooked as above. Meal, 78 cents per bushel. Gain of the two 104 lbs. in 20 days.

EXPERIMENT IV.

Stundry swine purchased from a drove, and fed with meal and potatoes washed and mashed.

No. 1, weighed 28th March,	97 lbs.
Do. do. 19th May,	165 "
Gain, in 52 days,	68 "

No. 2 weighed 28th March,	134 "
Do. do. 19th May,	186 "
Gain in 52 days,	48 "

No. 3, weighed 28th March,	100 "
Do. do. 19th May,	186 "
Gain in 52 days,	86 "

The two following raised on the farm a fed as above—

No. 4, weighed 25th April,	-	151 lbs.
Do. do. 19th May,	-	206 "
Gain in 24 days,	-	<u>55</u> "
No. 5, weighed 25th April,	-	140 "
Do. do. 19th May,	-	165 "
Gain in 24 days,	-	<u>26</u> "

EXPERIMENT V.

In this case it was not intended to force their thrift, but to keep the swine in an improving condition. They were shoats of the last autumn and were of a good breed.

Tuesday, 3d April, 1833, put up four shoats and began feeding them with Indian hasty-pudding.

April 3d,	April 22d,	gain,	June 25th,	gain,
No. 1, 176 lbs.	202 lbs.	25	264 lbs.	62
No. 2, 119 "	153 "	34	226 "	73
No. 3, 150 "	170 "	20	218 "	48

		Total,	183
No. 4, 121	145	24, killed 20th May.	

From the 3d April to 22d April, the above swine consumed seven bushels and one peck of Indian meal. From 22d April to 25th of June, seven bushels of Indian meal cooked as above.

One of the above, No. 4 was killed on the 20th May; being absent, the live weight was not ascertained.

On the 25th June, the three remaining hogs were weighed, and in the 63 days from 22d April

to 25th June, they had gained in that time 183 lbs. as above.

After 30th of May, when one of them was killed, one peck of meal, made into hasty-pudding, with a small allowance of the waste of the kitchen, for a part of that time, lasted them three days, that is, 22, 25 or less than a quart, say 7-8ths of a quart, per day, to each.

At first we employed half a bushel of Indian meal to make a kettle of hasty-pudding, but we soon found that a peck of meal, by being boiled sufficiently, would make the kettle nearly full of hasty-pudding and of sufficient consistency. The kettle was a common sized five-pail kettle, set in brick work in the house; and it was remarkable that the peck of meal produced nearly the same quantity of pudding that we obtained from the half bushel, which shows the importance of inducing the meal to take up all the water it could be made to absorb.

The price of Indian meal was at that time 75 cents per bushel, 30 quarts to the bushel, deducting toll. The amount of meal consumed in the whole time, from 3d of April to 25th of June, was 14 1-4 bushels, the cost \$10 69. The total gain, making no allowance for No. 4 from 22d April to 30th May, which was not ascertained, was 287 lbs.

The gain of Nos. 1, 2, and 3, from 22d April to 25th of June, was 183 lbs. in 63 days; and allowing one peck to serve the three hogs for three days, required 5 1-4 bushels, the cost of which was \$3 94. The live weight could not be estimated at less than 4 cents per lb. when

pork was at market 6 cents. The value of the 183 lbs., therefore, was equal to \$7 32, or, at 5 cents, to \$9 15.

The gain of the swine for the first 19 days, from 3d to 22d April, was

No. 1,	26 lbs.	or	1,368 per day.
2,	34 "	"	1,789 "
3,	20 "	"	1,052 "
4,	24 "	"	1,263 "

The gain from 22d April to 25th June, 63 days, was

No. 1,	62 lbs.	or	0,984 per day.
2,	73 "	"	1,158 "
3,	48 "	"	0,761 "

The difference of daily gain in the two periods was attributable to the diminished quantity of meal. The question then arises whether the first mode of feeding was as economical as the second.

In the first 19 days, 7 bushels, 1 peck consumed, gave - - 104 lbs. gain.

In the next 63 days, 7 bushels, 1 peck consumed, gave - - 183 lbs. gain.

Had the first gain been in proportion to the second in reference to the meal consumed, the seven and one fourth bushels, which gave 104 lbs., should have given 252 5-7th pounds. This great disparity can be explained only in the more economical preparation of the meal, by which a peck, taking up as much water as it would contain, gave a kettle nearly full of pudding, when half a bushel of meal imperfectly repared gave little more.

This seems to demonstrate the great advantage of cooked food, both as it respects its in-

creased bulk and the improvement of its nutritive properties.

In an experiment recently made of giving swine raw meal mixed with water, I have found a falling off in their gain nearly one half, compared with giving the food cooked; such as boiled potatoes and carrots mixed with meal while hot. The result being in a sty containing a number of swine as 259 to 500.

"By experiments," says a writer in the *New England Farmer*, "which have been accurately made in Pennsylvania on Indian corn and potatoes for fattening swine, it was found that they increased in weight one third faster on the boiled than on the unboiled food; in other words, they gained three pounds when fed on the former where they only gained two pounds when fed on the latter. We are fully of opinion that steam-boiling for feeding or fattening all sorts of cattle, generally increases the value of the food as much as forty or fifty per cent."

A contributor to a highly valuable work* remarks, "The superiority of the method of fattening cattle with food thus prepared, (boiled or steamed,) has been proved by many experiments; and it is even said that some Post Masters on the western road, having in pursuance of a suggestion of the Bath Agricultural Society, boiled oats for their horses, and given them the wash to drink, have ascertained that a bushel given in this manner will maintain a horse in a better condition than two in the common way. So broad an assertion," adds the author, "may be

* *Mechanic's Magazine*, October, 1831.

received with hesitation ; yet the experiment may be worth a trial ; and if tried with candor on oats mixed with a certain quantity of dry food, there can be little doubt that steaming a portion of the provender, whether mixed with roots or not, will be found an economical plan.

“In compliance,” says a writer,* with the suggestions made in the Cabinet, several farmers have procured and put up large boilers for the purpose of cooking corn and other grain, for stock, and so far as the trial has been made it answers expectation fully. In one case two bushels of the hard Dutton corn were subjected to the operation of cooking several hours until they were fully expanded ; they were then measured accurately and found to have increased in bulk to five bushels and half a peck.

Again, a correspondent of the Farmer's Register, under date of February, 1839, thus writes :* “I have been using the root steamer described in the Cultivator of January 1838, for the last twelve months, and am so well pleased with it that I cannot refrain from adding my testimony in its favor, and recommending it to my brother farmers. Mine was made by directions given in the Cultivator and has fully answered my expectations. My method of using it this winter, when, from the dry summer and fall we had so few vegetables, has been as follows. When fattening my hogs, all the corn they consumed was steamed until it became perfectly soft upon the ear, which of course saved the trouble of shelling and the toll of grinding. Up-

* Vide Farmer's Cabinet, vol. 3, p. 109. † Vol. 7, p. 15.

on this food almost exclusively, with the addition of a few vegetables which we could spare from the garden steamed with the corn, I fattened my hogs, and never had as fat hogs before or as cheap pork. The corn in steaming increases nearly double in quantity, and I think a saving of at least one third may be calculated on. After my hogs were killed we began to steam for beeves, milch cows, hogs and horses. My plan is to put a sufficient quantity of shattered corn for my hogs in the bottom of the boiler, then ears of corn for my horses, short corn, cotton seed, vegetables, &c., for my cows and beeves, and then fill up with stalks and any other coarse provender, for oxen. The stalks, from steaming, became very soft, and are greedily eaten by cows and steers. The shattered corn, together with the liquor in the bottom of the boiler, I found excellent food for sows with young pigs. Some farmers will say this steaming is too troublesome; but I assure all such they will be amply paid for all trouble, and the small expense attending it. The consumption of wood is very inconsiderable, and, with the attention of a small boy, I am able to save one third of my provender, increase my milk and butter, and keep my horses, oxen and hogs in good order. We use the boiler and steamer also to heat water to kill hogs, and for other purposes. Mine holds above thirty-five gallons."

The experiments of Mr. Colman, especially the one exhibiting the almost similar quantity of nutritive matter, obtained from a half bushel and a peck of Indian meal, furnishes strong

proof of the principles laid down by M. Raspail and M. Biot, that the boiling process should be continued for a long time, and with as much water as the article of food can possibly be made to absorb, in order that the clots of gum-like matter, which are disengaged from the broken globules containing the dextrine, may not cause those unbroken to adhere together; this prevents the free access of the water to any portion of the grain. And in connection with this principle, there is another which should be continually borne in mind; that grain of any kind cannot be well dressed or cooked by dry steam of low pressure applied to the dry grain. If the steam is at a low pressure or a little above atmospheric, a species of parching is produced in the grain so heated, and if steam of very light pressure is applied, the grain will be entirely carbonized. It is recommended, therefore, to soak the grain in water for a period of from six to twelve hours according to its state of dryness and then place it in the steaming apparatus for an hour, when the grain will be completely boiled.*

As to the relative advantages of steaming and boiling considerable diversity of sentiment prevails. Says that lamented and distinguished agriculturist, Judge Buel,† while remarking on this subject:

“The relative advantages of steaming and boiling will very much depend, we suspect, on the extent of the establishment. We have tried

* Vide Edinburgh Quarterly Journal of Agriculture.

† Vide Cultivator, vol. 2, p. 98.

both, though our steamer was imperfect; and have come to the conclusion, that when the number of hogs to be supplied does not exceed 15 or 20, boiling is preferable,—as with a good boiler, of the capacity of 30 gallons, from 12 to 16 barrels of food may be easily cooked in a day. But much depends on the judicious setting of the boiler, so that it may receive the whole advantage of the fire. For this purpose the brick work should be made to conform to the shape of the kettle, leaving a space of three or four inches between them, until it reaches nearly the top of the kettle, when a tier of brick set edgewise is projected for the flange of the boiler to rest upon; and the bottom of the fire-flue should be above the bottom of the kettle, or about parallel with the commencement of the slope which rounds its bottom. By this means, a flame is thrown upon the sides and bottom, and in such a manner that the whole boiler is covered with it on its passage to the smoke-flue; and the brick work being heated constantly, refracts back its heat upon the boiler. A tight cover should be laid over the cooking food, to prevent the free escape of the steam, by partially confining which, the cooking process is greatly facilitated.”

We are aware that many farmers are deterred from making experiments of the kind alluded to, by ignorance of the mode of constructing and supposed expense attending the erection of suitable steaming or boiling apparatus. Suppositions of this kind are entirely erroneous; and in order to afford our readers ample information

as to these particulars, we give, in a few following pages, statements from those who have tested the economy of such contrivances, together with plates of those steamers or boilers most generally used. Says a writer in the *Farmer's Assistant* "a steam boiler is commonly made by setting a kettle holding twelve gallons or more in a furnace of brick or stone, and over this a hogshead with one head taken out and the other bored full of holes, is set so close that the steam of the food, when boiling, can only rise through the holes and thence ascend among the articles to be boiled in the hogshead and pass off at the top. In this way a hogshead full of potatoes will be nearly as soon boiled as a small part of them only could have been if placed in the kettle underneath."

"As the kettle must be so closed as to prevent any steam passing off but through the bottom of the hogshead or vat, a pipe or tube must be set in one side, through which, with the aid of a tunnel, the water is to be poured into the kettle as often as occasion may require—when poured in the tube is to be stopped with a plug for the purpose." When grain is steamed-boiled it is requisite to have the bottom of the hogshead covered with a cloth, to prevent the grain running down through the holes. A correspondent of the *Farmer's Cabinet** remarks "a cask perforated with holes in the bottom, may be placed on the top of the boiler and filled with pumpkins or potatoes, and the steaming of them may go on at the same time that corn, buck-

* Vol. 3, p. 109.

wheat, or oats, are cooking in the boiler below. One farmer has adopted the plan of breaking the ears of corn into pieces three or four inches long, and then boiling or cooking them without shelling, and in that way feeding corn and cob together; his success so far in feeding some fattening cattle has been very satisfactory and encouraging."

"In order to enonomise fuel, and procure the full effect of the heat, it is very important to have a grate under the fire, with a door to shut close when the fire is put in, so that the air to supply the fire may pass in under the grate only; for where a fire is supplied with air which passes between it and the boiler, it is constantly carrying the heat up the flue and tends to keep the boiler colder than it ought to be from the quantity of fuel consumed; but when the air has to pass through the fire from below, it is thoroughly heated before it comes in contact with the boiler. After the fire has burnt down so as not to need ventilation for the smoke, the flue or pipe should be closed above, and the access of air under the grate prevented by a suitable stopper or door; this prevents the circulation of cold air from conveying off the heat from the brick work and boiler, and the process of cooking will be carried on for hours after the fire has burnt down, provided the access of cold air is prevented. The fire place should not be made larger than that of a small stove, and the brick work should be brought pretty well up to the boiler, leaving but a small space around it for the smoke to pass up. A boiler of the kind

referred to is of good value to a farmer for other purposes than cooking grain, and one of them ought to be put up on every farm in the country, and to be considered as much a fixture as a corn crib or a pig pen !”

The following contrivance, and the reasons which induced the author to construct it will be found in the same volume of the periodical last quoted.* “ Having previously persuaded myself that stall feeding on raw grain by undergoing a mere partial digestion was an ‘ uphill business,’ I found also the idea of steaming grain whole liable to many objections; among others the difficulty of steaming it thoroughly, the inconvenience and additional expense of fuel arising from the high temperature necessary to burst the globules containing the dextrine or nutrient matter of the grain are all worthy of notice. And the plan of scalding the chopped grain falls far short of cooking. Aware of the aptitude of all kinds of stock to fatten on the swill of distilled grain, I conceived the plan of boiling the grain after being chopped, to be fed sweet and fresh; conjecturing that a given quantity of the grain thus prepared would be converted into the greatest possible weight of flesh. I named the project to some intelligent persons, who condemned it as fallacious and chimerical, alledging that the chopped grain would settle to the bottom and burn the still; the boiled grain would scour the stock, &c.; reason and philosophy, however, supported a contrary opinion.

* Page 355.

"I accordingly procured a large hogshead still, put it up over a furnace in the corner of an out kitchen, on the best plan of close flues carried around the still, and finally turned into a chimney. The still was provided with the usual copper chains and fixtures for stirring; a movable cover made of plank was fitted close over the top of the still, perforated in the centre to admit the perpendicular shaft, on which a horizontal crank was fixed to turn the shaft and stir the still. The still is filled, or nearly so, with water by a convenient pump, and after boiling, the corn being previously wet in a barrel with cold water, and mixed to prevent the grain from forming lumps, is emptied by buckets into the still; the cover is immediately put on, and by means of the crank the still is well stirred, and the fire kept up, while the stirring is occasionally repeated for a few minutes, until the whole mass boils; then the fire is put out or covered, or the damper closed to stop the draught. After the grain has boiled about an hour it is ready to leave off. If left in the still, owing to the confined rarified air, it will continue boiling for many hours, although the fire be entirely out. The swill is conducted hot from the cask of the still by common square spouts, about thirty yards, into a hog pen and cattle yard; when cool it may be compared to jelly or starch, the water being apparently commuted into solid nutriment.

"I usually boil in the proportion of one bushel of grain to forty gallons of water. For fattening I have found one third of corn to two thirds of

bran sufficient; but if the fattening process is to be hastened, the proportion is reversed—taking two thirds corn and one third oats or bran. By this method cattle and hogs are fattened in half the time required on raw grain, with an economy of grain infinitely great.”

A method of removing large articles from kettles used as boilers, is suggested by a correspondent of the *Cultivator*.* “Having found it troublesome,” he remarks, “to boil potatoes for my stock in a potash kettle, and to get them out of the water when cooked, I had a thing made that has very much lessened the difficulty. It is a square wooden basket, about 24 inches at top, 20 inches at bottom, and 17 inches deep; frame of oak, 2 by $1\frac{1}{2}$ inches, with oak slats of 1 inch and same distance apart, to fill sides and bottom; two of the top rails, projecting at each end, made longer than the diameter of the kettle, serving as handles to lift the basket, and as a rest on the brim of the kettle for the purpose of keeping the potatoes above the water in it. I first put the potatoes into the basket, and by throwing upon them a few pailsfull of water, while a person at each end lifts and shakes them, most of the dirt is washed out; I then set the basket in the kettle, with only water enough to reach the bottom of the basket; throw a piece of old carpet over the basket to keep in the steam; make a brisk fire, and the potatoes are soon fit—to put on a table.”

A very simple and economical contrivance for

* Vide vol. 2, p. 137.

boiling food, is represented in the following cut.

It is simply a cast iron pipe, about five inches in diameter and six feet in length, closed at one end and open at the other.

It is fixed in the fire-place of the kitchen, by placing it across the fire-place, next to the back, on the hearth, and the open end of the

pipe extends through the jamb of the chimney about six or eight inches, and passes into a tub or trough, which has a circular hole cut into it near the bottom for the reception of the pipe which is prevented from leaking, by being caulked around with tow. By putting water into the tub with corn, or whatever kind of food you wish boiled, and making a fire in the kitchen (which is usually done in the country three times during the day) the pipe becomes very hot and causes the food to be boiled very done.*

LOOMIS'S STEAM BOX.

Mr. Loomis, the inventor of this valuable steaming apparatus, writes as follows.† “Any farmer who begins work in the morning, who can borrow and auger and use it, may provide himself with a good steaming apparatus in one day. We had one in use two or three years, such as I shall attempt to describe.

* Vide Cultivator, vol. 6. † Vide Cultivator, vol. 4, p. 116.

A, furnace door. B, boiler. C, steam-box. E, end slide. D, false bottom, with holes in.

Every farmer has an iron kettle, commonly called the great kettle, which will answer very well for a boiler. Let such a one be properly set in an arch; fit a cover of inch boards within the rim, and lute it with clay to make it tight. A piece, six or eight inches wide, should be nailed across the cover, to keep it from being warped. Make a hole in the centre of the cover, large enough to receive a tube of two inches calibre, to convey the steam. Another hole two inches in diameter is to be made near one side of the cover, through which the boiler is supplied with water, and is stopped with a plug. Make a box for potatoes, &c., three feet long,

sixteen inches wide, and two feet high. This is set over the boiler, resting upon the arch; the bottom of which should not be more than four or five inches above the cover of the boiler. The hole in the bottom of the box, to receive the tube from the boiler, is made near to one side of it, the box covering but little more than one half the boiler, leaving a convenient space to fill it through the plug-hole. The tube should project half an inch through the bottom, to prevent the drippings of the potatoes running into the boiler. The position of the box should be a little inclined; the lower end projecting beyond the arch for the convenience of taking out the potatoes when cooked. This end of the box is made with a slide to draw upwards when the cover is taken off. There is also a closely perforated bottom within the box, placed an inch and a half above the first, that the steam may be equally diffused throughout the mass. The end of the perforated bottom next to the open end of the box, is fastened to a round stick passing through the box from side to side, and serves as a hinge to this bottom. On the other end of the perforated bottom, let a board of the same width be fixed, that shall rise near to the top of the box, having a hole in it to insert a hook for the convenience of raising it when it is to be emptied, if it be required to do so while the potatoes are steaming hot. Thus the box may be readily emptied of its contents without stopping up the holes in the bottom, as would be unavoidably done with a hoe or shovel. The cover of the box should be secured from being warped.

Should it be required to steam on a larger scale than this, two such kettles may be used in an arch, and the steam from both conveyed into a box of greater dimensions.

This method of placing the potatoes, or the food to be cooked, very near the boiler, is manifestly more economical than that by which the steam is conveyed the distance of several feet in a metallic pipe; as in the latter case, a considerable portion of heat is evidently lost before it reaches its destination.

Says another writer* while remarking on this contrivance, we would recommend the additional improvement of a tube, put through the cover of the boiler, with from one to two feet of it above the cover, and extended down as low in the boiler as will be safe to suffer the water to be boiled without injuring the boiler; which tube will emit steam whenever the water gets below the end of it, and therefore give warning that the boiler needs replenishing with water. This tube will also answer for a conductor, through which the water may be conveyed into the boiler, with a faucet extended directly over the end of the tube, and guaged so as to admit the water down the tube about as fast as it boils away. We would also recommend the addition of a faucet put through the cover of the boiler, for the purpose of throwing off the water, when the boiler happens to get filled too full. The cover of the boiler may be fitted so as not to leak steam, by nailing two or three strips of cloth around its edge.

* Vide Cultivator, vol. 4, p. 149.

The above named tube may be of any convenient bore, from half an inch upwards, and should remain open at both ends. It answers the double purpose of safety-valve and feeding tube. Upon this plan, a boiler that will hold one pailfull, will steam several bushels at a time; and as quick as the same quantity can be boiled in a large kettle.

The steam pipe may be placed at one side of the cover of the boiler, and answer equally as good a purpose as though it were at the centre; but in no instance should the steam pipe be permitted to extend below the under side of the cover.

A very convenient steaming apparatus, on a

somewhat more extensive scale, is mentioned by Mr. Low, in his Elements of Practical Ag-

riculture,* and has been copied to a considerable extent in many of our agricultural periodicals. The cost of its erection is estimated by Judge Buel at the moderate sum of fifty dollars, and it is well adapted to large establishments.

“A is a barrel, or other vessel, for containing water and supplying it to the boiler C. D is a safety-valve. At the upper part of the boiler at C are placed two tubes, with stop-cocks. One of these tubes terminates near the bottom of the boiler. Upon the stop-cock being turned, water should always issue from this tube. When, therefore, steam issues from it, and not water, this indicates that the water is too much boiled away, and consequently that there is a deficiency of water in the boiler. The other tube terminates within the boiler, near the top. Upon the stop-cock being turned, steam ought always to issue forth. But should water in place of steam come out, then it will appear that the boiler is too full of water. In this manner the attendant, by turning either stop-cock, ascertains whether there is a deficiency or excess of water in the boiler. The quantity of water could indeed be regulated by nicer means; but that described will be found sufficient in practice. F is the furnace, and E is a pipe with a stop-cock communicating with the boiler. When it is wished to obtain hot water, it is obtained by this pipe. A pipe G communicates with the barrels H, I, and conveys the steam to them; and in these is placed the food to be steamed. By means of the stop-cocks *l, l*,

* Vide p. 130.

the communication can be cut off with any of the barrels, so that the steam may be admitted to one barrel, or two barrels, or three, as may be wished. The barrels in the figure are two, but the number may be extended. Each barrel has a movable lid, which is kept down by screws, and a sliding board below, by which the food when ready, is withdrawn. The barrels are raised on a frame, so that a wheel-barrow or vat may be placed below, and the food at once emptied into it.

“By means of an apparatus of this kind, roots and other parts of plants may be steamed in a convenient and economical manner.”

One of the most convenient and economical contrivances for boiling—to the merits of which the present writer cheerfully bears testimony from considerable experience of its advantages—is now used to some extent in several counties of Virginia. A correspondent of the *Farmer's Register*, under date of May, 1839, gives the following description. Suppose two or three coffee pots, one holding a gallon and the other three quarts, deprived of their spouts, handles, and bottoms, insert one within the other, force the upper and lower ends of their peripheries together, and have them well soldered, thus you will have a double cylinder. Put on the outer sheet, within an inch of the top, as also eight or ten inches lower, two circular pieces about two inches in diameter; over these two holes, two copper pipes about five or six inches long, are to be soldered, at the bottom of the cylinder at right angles to the pipes. Cut a

hole an inch in diameter, and solder over it a pipe (to draw the remaining water off) of about four inches long. Two arms of copper (cylinders) about an inch in diameter, and three inches long, are then to be soldered on the outer cylinder, just about the centre of gravity, when the cylinder is held erect or vertical. At the bottom, in the inside of the inner cylinder, place an iron grate, like that part of the gridiron on which the broiling is done. Let there be then placed an iron pipe (stove pipe) about five feet long, on the top of the cylinder, having a hole cut near the bottom of it, and closed by a door, hung on wire hinges, about five by eight inches.

The machine for heating the water being now complete, you must have tubs made of such sizes as desired, and have holes bored for the insertion of the two pipes just mentioned. A frame should be constructed wide enough for the arms of the cylinder to rest upon. The lower hole to be placed at the bottom of the tub, placed upon four or six legs, is then made. The places where the arms are to rest are grooved of the proper size on the bars of the frame, and the tub for boiling is also put on it and adjusted to the boiler. The tub is then filled with water. Fire is placed in the grate, and the cylinder filled with chips or small wood. In fifteen minutes the water will boil. In speaking of the coffee pots, I have done it simply for elucidation. The double cylinder of copper should be, for common purposes, about two feet six inches high, the diameter of the bottom

or lower muzzle about ten inches, and of the upper about seven.

Reference to the following cut, will more clearly exhibit the various parts of an apparatus similar to the one proposed. It will be observed that we have placed a furnace below the boiler. This can be done with small expense; or a small grate, like the one proposed, can be adopted in its place.

References—*a*, the boiler, made of copper and composed of an outer and inner cylinder; *b*, the furnace; *c*, stove pipe; *d*, door in the stove pipe to admit fuel; *e, e*, copper pipes passing from the boiler to a tub; *f*, tub for water and food; *g*, frame on which the tub

rests ; *h*, spout to conduct off the water of the boiler.

The boiler, as here represented, has an open chamber through the whole length, for the fire and smoke. The space between the fire chamber and the outside of the boiler contains water.

“ With a few chips,” says the correspondent of the Farmer’s Register last quoted, “ a bushel of potatoes, apples, corn, &c. &c., can be boiled in half an hour from the kindling of the fire. If it be desirable to boil a greater quantity, a larger tub will be employed. By use of this machine in boiling wheat, chaff and apples, the milk of my cows was more than doubled. In washing clothes the advantages are equally great ; so in scalding hogs. A person not far from here used one of them in preparing the water to scald about twenty hogs. He heated the requisite quantity of water in a hogshead, in one-fourth of the time required by the usual mode of hot stones ; and instead of consuming near a cord of wood, he used but one arm-full and a half. For fattening animals, the agency of this machine is very valuable. It is also portable ; all its fixtures may be carried in the arms. It is as simple as can be in its structure, and does not cost, or ought not to, more than eight dollars.

The following are the dimensions of a boiler like the above, now in possession of the writer.

Whole height of boiler,	-	21 inches
Diameter at top of the outer	} 8 “	
cylinder, - - -		

Diameter at top of inner cylinder, $5\frac{1}{2}$ inches

Diameter at the base of outer } 10 "
 cylinder. - - - - - }

Diameter at base of inner cylinder, $7\frac{1}{2}$ "

This leaves an enclosed space of $1\frac{1}{4}$ inches between the outer and inner cylinder, where the water is contained, and an open space between the opposite sides of the inner cylinder, $5\frac{1}{2}$ inches at top and $7\frac{1}{2}$ at bottom, for wood and coal.

To use this apparatus for steaming, nothing more is requisite than to place a strong cover on the tub and keep the water in it always below the surface of the upper pipe—or what would be still better, (graduating the water as before,) to make use of a high tub, or hogshead, in which a division is made just below the upper pipe. In this mode, the operation of boiling and steaming may proceed simultaneously.

CHAPTER V.

General remarks on feeding—Treatment and food of young pigs—Of growing stores—Soiling—Proper periods for fattening and killing hogs—Treatment of fattening hogs—Food—Corn—Oats—Rye—Barley—Buckwheat—Beans—Pease—Tares—Potatoes—Carrots—Turnips—Ruta-Baga—Cabbages—Parsnips—Mangel Wurtzel—Sugar Beet—Pumpkins—Sunflower—Flax—Linseed jelly—Artichokes—Acorns—Distillers' grains—Hay-tea—Apples.

IN the preceding chapter we have devoted considerable attention to the history of swine, the established rules for the selection of good breeds, the construction of proper pens or enclosures, together with the preferable modes in which aliment should be prepared ; and we now pass naturally to consider the rearing and feeding of these animals, the kind of food best suited to promote their growth, as well as the quantities in which it should be administered.

IN the consideration of these important points, it is rather the super-abundance than the scarcity of experiments we have to encounter, and our labor is at once confined to a careful selection of suitable facts from a multiplicity of more or less accurate suggestions and experiments. We propose, therefore, in the following chapter to consider *separately* the more prominent articles used as food for swine, and thus present, under appropriate heads, the results which observation and research have accumulated. To these may with propriety be added a detail of

the course pursued by those, whose long experience in raising swine entitles their opinions to credit and attention.

We have already alluded to the neglect of regular and systematic feeding. As regards the quantity to be given, especially to hogs confined in pens, it is desirable that each portion should be at the same time *sufficient for the animals, and yet small enough to be entirely consumed*. Economy in feeding, no less than in the preparation of food, is a point of great importance.

“The most correct feeders, remarks an able writer, and those largely concerned, endeavor so to apportion their food, that the troughs may be entirely cleaned, and yet the appetite of the animal thoroughly satisfied; a plan which has proved in a thousand examples to fatten the *most speedily* and make the *fattest* hogs; so totally opposite, nevertheless, to the ancient and still too common country method of filling the trough at every feeding hour whether empty or not. I have witnessed an old farmer repeatedly urging his servant to the performance of this duty, whilst the hog-trough remained constantly replenished with a mingled mess of meal and dung of equal use to the hogs, to lie and wallow in as to feed upon. To speak guardedly, I have no doubt that in former days at least one basket of corn in three has been in this mode converted to dung, without ever having entered the bodies of the animals.”

But while pigs should be kept on a full allow-

ance of food, care should be taken to prevent their being *gorged* by its excess. If through inattention to this matter, hogs are surfeited while fattening, one of the best remedies is to administer half an ounce of sulphur to each animal, two or three times daily for the space of a few days. This has been found in almost all instances, where it has been applied, to be an effectual corrective of the evils resulting from over feeding. Swine, remarks Judge Peters, in his "Notices for a young Farmer," should be moderately and frequently fed, so that they be kept full but do not loathe or reject their food, and in the end contract fever and dangerous maladies originating in a hot and corrupted mass of blood. They should always be supplied with dry rotten wood, which should be kept in those pens for the animals to eat as their appetites or instinct may direct. Charcoal, it is said by some, will answer as good if not a more valuable purpose ; and that if swine can obtain charcoal, they will not only greedily devour a small portion of that substance, but will be little inclined to rooting and remain quiet in their pens.

"But in whatever way," says a writer in in Rees's Encyclopedia, "the food may be given, great care should be taken that fattening hogs have a full allowance at sufficiently short intervals to keep them constantly *in a state of rest*, as it is on this principle they become fat in an expeditious manner. It is indeed frequently

observed, in fattening hogs, that they pay better for their keep in *the latter* part of their fattening than in the former, which probably arises in some measure from their not being fed in a sufficiently full manner, or with sufficient frequency in the beginning so as to keep them in a state of perfect quietude in the styes."

"In feeding," remarks Henderson,* "great care must be taken not to give them such a quantity of food as may overload their stomachs, which may cause them to leave off feeding. If at any time they seem rather to loathe their food and leave part of it, the only way to remove that, is to lessen the quantity, and now and then change their diet, giving them a few oats, barley, beans, or pease, two or three times a week, and to be particular in giving them no more than they can devour. The manger, or trough, must be always well washed out before putting in their victuals, as giving them clean food is a leading article to ensure their success in feeding.

"If they leave any food in their manger, never offer it to them again, but allow some of the young stock to eat it up, which they will do with a good deal of pleasure. Boiled potatoes, meat, &c., may raise a drought upon them; to remove which, they should frequently have clean water mixed with a little meal. They ought to have salt to all their boiled food. A

* Henderson on Swine, p. 39.

few oats for dinner, occasionally, by way of change will not be amiss."

"If their feeder wishes to be profited by this husbandry, he will never allow any of the stock to get *poor*; for in that state they will consume much more food than is required to keep them in good condition. It is too general a practice to pay no attention to feeding them until they are put up, perhaps in November or December, when with a little pains they might be as fat, and weigh nearly as much, as at the period when they are feeding; which would save two months feeding."

In the language of pork-raisers, swine are divided into, *sucking-pigs*, *weanlings*, *porkers* or *growing stores*, and *hogs*; these terms having reference respectively to the age of the animal, and attention to these distinctions is necessary, to a correct understanding of the remarks of writers on this subject.

TREATMENT AND FOOD OF YOUNG PIGS.—In the second chapter of this work, we have already alluded to this subject,—and it is certainly one deserving the most careful consideration,—care and attention to these animals at this tender age, is of far greater importance than the practice of many would lead us to suppose, and upon their treatment during the few first weeks depends the ease and rapidity with which they can be subsequently reared and fattened. To wean young pigs in such a manner, that they may lose no flesh during the process, and

may remain at its close in a healthy and growing condition, is an undertaking attended with considerable difficulty. Their food should in general be given *moderately warm*, and milk is undoubtedly one of the best articles which can be offered at this period. The produce of the dairy should, therefore, be used frequently and freely. Many judicious farmers have asserted, as the result of experience on this subject, that cows may be kept, for the exclusive nourishment of *young pigs*, with great economy. That this will be the case, when the proceeds of the dairy are given, no one who has tried it will dispute. Several instances are recorded of hogs that have been *fattened entirely* on this article for the purpose of experiment; and the result has shown, that no pork is superior in point of weight and substance. Of the astonishing rapidity with which animals will thrive and increase while using it, we have ourselves seen abundant proof, in the growth of an improved Berkshire Boar, which was weaned under the direction of a highly intelligent agriculturist—Solomon Porter, Esq., of Connecticut,—and afterwards fed almost entirely on this article, and which attained, at the age of three months, the great weight of *one hundred and forty pounds*.

The practice of mixing milk with other articles for food of young pigs, is highly recommended by many farmers. Says a judicious breeder, in a letter to the Hon. H. L. Elsworth,

“From actual experience, I have come to the conclusion, and practised upon it for the last twelve or fourteen years, of having as many spring pigs (that come say in March) as I have cows for the summer, and feeding the pigs on milk or whey, mixed with provender, ground from corn, rye, oats, barley, or buckwheat, and prepared in the form of a pudding, in which way the pigs will eat it best. If they appear to be clogged with one kind of grain, I try another, and often mix different kinds together.”

The author of the *Practical Elements of Agriculture*, suggests that pigs should be weaned at the end of the first six or eight weeks; and be fed three times daily with wheat bran, barley dust, or by farinaceous food mixed with water warmed to the temperature of the mother milk, and with whey, or other refuse of the dairy or kitchen. Young pigs, he remarks, are sometimes disposed of when sucking the dam. In other cases, they are sold, when weaned, to persons who design to feed them, and in other cases they are fed by the breeder himself.

“When they are fattened by the breeder, two modes of feeding may be adopted. They may either be suffered to go at large, or they may be kept in pens and houses; by the first of these methods after being weaned and fed for a period until they are able to shift for themselves, they are turned abroad to pick up what they can in the straw yard, a little green food, as

tares or clover during summer, and turnips or potatoes during the winter being supplied to them. They do not, under this management, receive any more expensive feeding until they are put up finally to be fattened, when they are confined for a few weeks and fed on farinaceous and other food. The pigs intended for this species of management should be the best of the *smaller varieties*, and they may be killed for domestic use or disposed of when seven or eight stones weight. All the accommodation required under this system of management, is a few pens with sheds: first, for the breeding swine when nursing their young, and second, for the pigs which are in the course of being fattened.

In all cases upon a farm, a certain number of pigs may be kept at large in this manner, for picking up the waste of the farm yards. But the regular course of management and that best adopted, where the feeding of the animals is carried on on the large scale, is where separate feeding-houses for the pigs in which a greater or lesser number can be kept.*

"Weanlings," remarks Mowbray, "should have at least one month of delicate feeding, warm lodging, and care. The same kind of food should be continued to them three times a day, to which they were at first accustomed with the sow. The *first* food should consist of warm

* Vide Elements Practical Agriculture, p. 601.

and nourishing wash, whether from the kitchen or dairy, thickened with fine pollard or barley meal. A portion of strong beer may be added as a cordial, should circumstances render it necessary. The common wash, pollard or meal mixed with water, if scalded the better. The same diet is proper for the pigs to partake of whilst sucking. Very young pigs ought not to be left abroad in continual rains, and will always pay for a daily moderate feed of old beans with clover."

"Weanlings are fattened for delicate pork, *chiefly in the dairies*, where they are made ripe in a few weeks. Generally a pig of five or six months old will be fattened in seven, or eight, or twelve weeks, dependent on his condition."

An English writer remarks, "Swine will fatten much faster on *warm* than cold food. Corn and cold water will make them healthy, but warm beverage is considered as requisite to quick growth. Some English farmers turn in their little pigs to the fatting sty. While the fatting hogs are taking their repast, the little ones wait behind them, and as soon as their betters are served, lick out the trough."

"Besides the advantage of having by this method no waste or foul troughs, there is another: the large pigs rise alertly to their work lest the small ones should forestall them, and fill themselves the fuller, knowing they have it not again to go to."

"The disadvantage of this practice is that the

large ones are apt to lord it too much over the little ones, especially in a confined sty. If, however, they have a separate apartment assigned them, with an entrance too small for the fatting swine to follow them, this disadvantage would be in a great measure remedied."

A writer in Ree's Encyclopedia, while writing in regard to *young pigs* and *sows with pig*, holds the following language: "The sows considerably advanced in pig, and those with pig, should be fed in a better manner than the store pigs. The former should be supplied with good wash twice or oftener in the day, and have a sufficient allowance of cabbages, potatoes, carrots, or other similar vegetables, so as to keep them in good condition, which is shewn by the gloss of their coats. The sows with pig, should be kept with the litter in separate styes, and be still better fed than those in pig. When dairying is practised, the wash of that kind which has been preserved for the purpose, while the dairying was at its height, in brick cisterns constructed for receiving from the dairy,—must be given them, with food of the root kind, such as carrots, parsnips, potatoes, and cabbages in as large proportions as they will consume them, in order that the pigs may be properly supported and kept in condition.

But when the business of dairying is not carried on, so as to provide wash of that sort, meal of some kind or other must, Mr Arthur Young thinks, be had recourse to for the making of

wash, by mixing it with water which, in the summer season, will be sufficient for their support, and in winter it must be blended with the different sort of roots prepared by boiling ; or when for young pigs, with oats and pea-soup. With this soup and dairy-wash, when proper attention is bestowed, young pigs may, he conceives, be weaned and reared in the winter season even, with profit and success. The pea soup is an admirable article when given in this intention. It is prepared by boiling six pecks of peas in about sixty gallons of water, till they are well broken down and diffused in the fluid ; it is then put into a tub or cistern for use.

When dry food is given in combination with this, or of itself, he advises oats, as being much better than any sort of grain for young pigs, barley not answering nearly so well in this application. Oats coarsely ground have been found very useful for young hogs, both in the form of wash with water, and when made of a somewhat thicker consistence. But in cases where the sows and pigs can be supported with dairy wash and roots, as above, there will be a considerable saving made by avoiding the use of the expensive articles of barley meal, peas or bran, and pollard.

Mr Donaldson remarks that in the usual mode the pigs reared by the farmer are fed for some weeks, after they are weaned, on whey or butter milk or on bran or barley meal mixed with water. They are afterwards maintained

on other food as potatoes, carrots, the refuse of the garden, kitchen, scullery, &c., together with such additions as they can pick up in the farm yard. Sometimes they are sent into the fields at the close of harvest, where they make a comfortable living for several weeks on the gleanings of the crops; or at other times where the farms are situated in the neighborhood of woods or forests they are sent thither to pick up the beech mast or acorns in the fall of the year. And that when they are arrived at a proper age for fattening, they are either put into this fitted up for the purpose, or sold to distillers, starch makers, dairy men, or cottagers. As to the treatment and feeding of *porkers*, or *growing stores*, considerable diversity of sentiment prevails; some contending that they should be constantly confined in suitable pens or small enclosures, which others recommend there ranging more at large—where the object desired is merely to keep these animals in a thriving condition till the season of fattening arrives, the latter method may be pursued perhaps with some advantages. Still in these cases, the range allowed should not be too extensive, and generally confined to yards in the immediate vicinity of the barn, or at the proper season to pastures well set in clover.

TREATMENT AND FOOD OF GROWING STORES.
Store pigs, says Mowbray, may generally be fed on almost any sort of food which they will eat, and thus acquire growth; and then for six

weeks or two months before they are slaughtered they should be fed on grain and milk which will harden and give flavor to the pork. Through the winter their food will be the run of the barn yard, roots of all kinds (of which every farmer should have a plentiful supply) including ruta бага, and cabbage, with occasional rations of grain of some kinds with wash. In autumn and in a plentiful season swine will subsist on acorns; and in summer on clover, lucerne or tares. Swine turned to shift upon forests or commons are apt to stray and hide themselves for a considerable time; the ancient and ready method to collect them is by the sound of a horn with which they have been accustomed to be fed. Feeding pigs, says Low, are fed on green food of all kinds; and hence clover, lucerne and tares may be employed in feeding them in summer, though to fatten them finally some farinaceous or other nourishing food will be required. They will also graze like sheep and oxen, but grass consumed in this way is not the natural food of the animal, which consists of roots rather than herbage. The feeding of pigs on herbage is merely to carry them on for a time till more fattening food can be procured. When fed on herbage a ring should be passed through the cartilage of the nose to prevent their following their natural instinct of ploughing up the ground, but the same purpose may be more effectually served by dividing the tendons by which they are enabled to move the snout.

“ There are two purposes,” continues the same author when describing the mode pursued by raising small stocks on some of the English farms, “ for which pigs may be fattened. The one is to yield pork which may be used either fresh, salted or pickled ; and the other is to produce bacon which is prepared by salting and drying the flesh. When fed for pork, which is the most convenient system in the practice of the farm, the pigs may be reared to the age of six or eight months ; when intended for bacon, they must be reared to a greater age and size, as ten or twelve months. When the object is pork, the smaller class of early pigs is to be preferred ; when bacon is desired the larger class should be cultivated.”

In the case of feeding for pork alone, it has been computed that upon a regular farm, with a supply of tares and clover to the animals in summer, and of potatoes and turnips in winter, and with no other feeding than the refuse of the barn, milk house, and kitchen, one pig may be fattened in the year for every six acres of land under corn crop. Thus supposing there are to be 240 acres in corn crop, the quantity of pigs fed annually upon the farm might be 40. To feed this stock, in addition to what they can pick up in the straw yards, about an acre and a quarter of clover, and an equal quantity of potatoes will be sufficient. To keep up the number three breeding swine will be required, of which two should be sold each year, their place

being supplied by an equal number of younger ones reared upon the farm. The surplus beyond the quantity of 40, which it is proposed to feed may be disposed of when weaned. This is a method of management practicable upon ordinary farms, *without any interference whatever* with the food and attention required for larger stock.

Another method of management may be adopted. This is to take only one litter of pigs from each sow, to sell the pigs as soon as they are weaned, and immediately afterwards to feed the swine. This will be a profitable species of management, provided there is a sufficient demand in the district for so many pigs when weaned.

Mr Henderson, in his Treatise on Swine, recommends this system. He calculates that one sow for every seven and a half acres may be fattened in this manner. He proposes that the breeder shall purchase in the first place twenty sow pigs and one boar pig which had been born the beginning of June. In the following June all the females will have had pigs. These they are to suckle for about two months. The pigs are then to be sold just when weaned except twentyone, namely twenty sow pigs and one boar pig ; these being selected from those which are of the handsomest shape, so that the subsequent stock may be kept good and uniform. The farmer will now be in a situation to go on without further outlay of money for stock. In

a month after the pigs are weaned and sold, the sows themselves are to be put up to feed. This will be about the beginning of September. The male must then be admitted to them so as to render them quiet and apt to feed, and in two months they will be fat and of a large size.

Now the introduction of a practice similar to this, by the cultivators of many of the large farms in the western and other portions of the United States, would be attended with great advantages. It is at once a simple and convenient method, of deriving large profits, from what is generally neglected as wastage—the remaining fodder after the crops have been gathered ; and it exhibits most conclusively the good results of endeavoring to *make the most of everything*. The more general cultivation of the corn crop, and the cheapness of grain, would allow the keeping in the country, of even a larger number than those proposed, at a very trifling advance, if any, in the expenses.

The whole system of European agriculture, and the modes of feeding stock, differ essentially from the practice of this country, and the desirable object there, is often to avoid the use of many articles for food, which the exuberance of our soil render economical. But a detail of the practice pursued by judicious cultivators, is always valuable for important truths of general application.

Where swine are suffered to range for a great portion of the year, and are confined in the

winter to the barn yard or small enclosures, Mr Young advises that the whole number of hogs should be looked over in the month of May, and sorted ; such as have attained half or more of their growth, being drawn and turned upon lucerne or clover crops, where they should be kept until the end of September, care being taken that the fences are in good order, and that proper ponds and other places are provided for the hogs to drink at. Under this management they are found, he says, to grow rapidly, the food in general agreeing well with them, and they are then taken up in excellent condition for fattening. In this mode the hogs sufficiently grown are selected from the sows that have pigs and the weaned pigs, and only the latter left to be fed with the dairy or other wash, with suitable green food, such as lettuces, cabbages, &c., by which a much larger stock of breeding hogs may be kept. The cabbages may be used for the sows, that have spring litters, and the lettuce for those that have autumn litters. It is observed that these plants are of great use for sows and pigs, promoting the increase of milk in a great degree, affording great assistance where the dairies are small. From the sweet juicy quality of the lettuce, the hogs are not only extremely fond of it, but it becomes highly nutritious. In this way the swine may be well supported, and carried forward till the stubbles are cleared, when, they may be turned upon them, and thus the whole year be pro-

vided for, in these different ways with the greatest economy.

SOILING. It has been further stated, says the author of the article on swine, in Rees's Encyclopedia, that although the system of management proposed above be advantageous, that of *soiling* the hogs in the yards with green food, notwithstanding the increased expense of it, and the unavoidable waste of a certain portion of the food, is highly preferable on account of the vast store of manure that may be raised. It cannot however be attempted with propriety unless the farmer be provided with abundance of other materials for the purpose of litter, and substances of the peaty or earthy kinds, for the purpose of covering the floors of the hog yard, in order to absorb and prevent the waste of any portion of the liquid matters that may fall upon them. In this method clover, chickory, tares, and lucerne are the kinds of food that are most commonly employed ; but there are others that may be brought to their assistance when necessary, especially on the stronger sorts of land, such as beans, eaten green, which afford a large quantity of food, in proportion to the land they occupy ; the whole stems being consumed ; and cabbages may likewise be had recourse to for the summer as well as winter food of these animals. Mr Young advises that the yards of the hogs styes should have gates sufficiently large for bringing in carts loaded with the different articles of food, and litters, as well

as for removing the manure that is made in them. In this system of practice, instead of a few sows only being kept, as was usual in combination with the dairy system, great numbers may be maintained, and a great many young pigs be raised.

PROPER PERIODS FOR FATTENING AND KILLING HOGS. As to the proper periods for fattening and killing hogs some diversity of sentiment prevails. Mr Phinney, in an able letter published in the *New England Farmer*, remarks; "On a large farm, where much green herbage is produced, and where the value of the manure is taken into account, I consider the pigs killed at the age of fifteen or sixteen months as giving the greatest profit. When it is intended to kill them at this age, they may be kept on more ordinary and cheaper food for the first ten or twelve months, or till within four or five months of the time of killing. The manure they make more than pays the extra expense incurred in keeping them the longer time; but spring pigs which are to be killed the ensuing winter and spring must be kept upon the best of food from the time they are taken from the sow until they are slaughtered."

Cobbett recommends keeping hogs until they are more than a year old before they are killed. He says the flesh is more solid and more nutritious than that of a young hog, much in the same degree that the mutton of a full mouthed

wether is better than that of a younger wether. The pork or bacon of young hogs, even if fattened on corn, is very apt to *boil out* as they call it; that is to say come out of the pot smaller in bulk than it goes in.*

Mr Featherstonhaugh observes† “Farmers differ much in their plans of raising stock for pork; some permitting their shoats to run at large eighteen months, till they are penned up to fatten; others give them a range in clover pastures, and begin to fatten them earlier. I apprehend there is a much more profitable way, and attended with less trouble for those who have the right breeds. According to the quantity of pork wanted, should be the number of breeding sows kept over, and there should be no other hogs on the farm, kept over winter, but the breeding sows. These, when they pig the latter end of March, should be fed in the most attentive manner with swill and shorts. The pigs from a full grown sow, will generally be twelve in number; these should be thinned down to eight, and as soon as they begin to feed freely out of the trough, should be weaned and afterwards fed with green tares, clover, boiled potatoes, ground peas, unmerchantable corn, or any other nourishing food, turning them out every day into a small yard where there is

* Vide Mowbray on Poultry, &c., p. 187.

† Memoirs of the New York Board of Agriculture, volume 1, p. 332.

a shallow pond for them to lie in. A remarkable breed of pigs which had been treated in this manner, were exhibited at Duaneburgh fair; when eight months old, one of them was slaughtered, and weighed exactly three hundred and eleven pounds. They all attracted universal attention. This method, as it is attended with very little trouble, and leaves so small a quantity of stock on hand to winter over, appears to me to be more economical in every point of view, than any other which is practised."

In the county of Rensselaer, New York, says Fessenden,* some of the farmers assert, that March pigs, killed about Christmas, are the most profitable for pork. Others say that pigs ought never to come until June, "for the cost of earlier pigs exceeds the profit."

John Lowell, Esq., in a communication to the Rev. Henry Colman, Agricultural Commissioner of Massachusetts, remarks:—"I never *wintered any pigs*, as no person resides on my place from December 1st to May 1st. It was therefore a matter of importance to me, to ascertain on what description of pigs, or rather of what age the most flesh could be put, in any limited time, with similar treatment. I may say that I have fully and clearly ascertained from a trial of twenty years, that young pigs of from 25 to 30 pounds, will give nearly double, in some remarkable cases three times as many pounds as

* Vide Complete Farmer, p. 157.

shoats of six months, weighing from 100 to 150. I have taken two pigs of 100 pounds each, age six months, and never was able between May and November, to get them above 180, rarely above 170. I have taken three pigs of about 30 pounds each, and on the same food which I gave to the two that would weigh from 170 to 180 each, in the same period; nay I have taken pigs of 200, and never could get them to weigh more than 300 in seven months on my food. The way I ascertain the quantity of food is, I never give any thing but the produce of my dairy, and the refuse of the garden, peaches, apples and cabbages, which are uniform generally.

Three pigs of 90 weight or 30 weight	
each will give ordinarily	- - - 510 lbs.
Less original weight will give 90 lbs., and	
often not more than 60	- - - 90
	<hr/>
Gain	- - 420

Two pigs of 100 weight each will give	
ordinarily	- - - 340 lbs.
Less original weight	- - - 200
	<hr/>
Gain	- 140

But the three pigs of 90 weight will not consume for the first three months half so much as the two of 150 pounds each, and I have kept a fourth and sold it in August for quarter pork.

There is nothing new or remarkable in these

facts. It is the law of the whole animal creation. It is true of the calf and of man. The child of 7 pounds, quadruples its weight in twelve months ; and the calf of 60 weight, if fine and well fed, will weigh 600 weight at the end of the year ; and (if a female) will not double the last weight at any age."

"It should be remarked that the weight at purchase is live weight, and at the sale dead, or nett weight, because, in truth, to the owners, this is the true mode of considering the subject. No doubt my food is peculiarly favorable to young animals, it consisting in very liberal allowance of milk. If the older pigs were at once put on Indian meal, they would attain 250 pounds at a year old, but the cost of the meal at 70 cents per bushel, would amount to 9 dollars, and if the first cost \$5,50 be added, and the pig sold at 6 cents, there would be but two dollars gain, on two pigs of 100 pounds each, while three small pigs without meal, fed on milk, *would give \$24, in the same time.* I do not mean to give minute details, but general views."

"As an important qualification of the foregoing statement, it should be added that shoats of six months bought out of droves, have usually been stinted in their growth, and animals, like trees, recover slowly after a check. I presume if shoats were taken from a careful and liberal owner, the difference would be less, but as a general law, it may be safely affirmed that *weight for weight at the purchase, the younger*

*the animal, the greater the positive, and the far greater the net gain.**

It is the general practice in the Western States, where the business of pork raising is conducted on the most extensive scale, to seldom fatten hogs before the age of 18 months, and in some cases even at a latter period. One of the main objects sought for there, is *great weight*, and the breeds generally cultivated (previous to the introduction of improved varieties) have been those that matured slowly. The extraordinary cheapness and abundance of grain, and immense forest and prairie ranges, have rendered this mode of treatment, advantageous and comparatively economical. Still it cannot be denied, that the methods pursued in that portion of our country, are those involving great and needless waste, and that the animals, rarely attain as great weight by one third, and in many cases one half, as a different mode of feeding would secure in shorter periods.

TREATMENT OF FATTENING HOGS.—We are decidedly of opinion that whatever mode of treatment and feeding may be adopted towards *growing stores*, while attaining their maturity, that swine during the *fattening process* should be confined in very small enclosures or stall pens. This is an arrangement which secures the most economical distribution of food, prepared in the

* Vide Transactions of the Essex Agricultural Society for 1839.

methods we have before described, and also, (which we deem of the highest importance) the uninterrupted rest of the animal thus treated. The numerous advantages attending this method, we have mentioned heretofore at large, and we cannot but believe that the results of a few experiments will lead to its general adoption.

There are several principles of great importance, which should never be forgotten by those who are desirous of fattening hogs with economy and expedition.

And first, it is desirable *that the breeder should be fully acquainted with the previous treatment and feeding of the animal he designs to fatten*, as a knowledge of these particulars, will materially influence the course he should pursue. Where hogs are purchased from droves, it is often difficult to ascertain these points correctly. This difficulty, however, will not exist where the animals are those of his own rearing. But the condition of all hogs, before they are put upon the fattening process, should be minutely examined. It has been found highly useful to give small quantities of sulphur, ashes, salt, and charcoal, for a few weeks before pigs are put up to be fattened—a practice, which is highly as useful at all times, and one which during the *fattening process should be most faithfully adhered to*. Hogs should not be shut up to fatten, immediately after long journeys, but should be permitted to enjoy a week or two of rest. Mr Colman states that in some instan-

ces, where his endeavors to fatten pigs were unsuccessful, he found that after slaughtering, the intestines were entirely corroded with worms, which undoubtedly prevented the thriving of the animals. Those, therefore, who find their hogs increasing slowly under good treatment, should suspect the existence of some such counteracting cause, and if possible, apply a remedy ; and throughout the whole process, great attention should be paid to state of the skin, and the general cleanliness of the animals. Experiment has proved that where the issues in the fore legs of hogs are stopped up, they will not fatten ; these should therefore be attended to, and kept open by rubbing with cobs, or other suitable substances.

Again, whatever may be the food designed to be used, *the change should be gradual, from that to which the hog has been accustomed, and high feeding at first, should be avoided.* This is necessary to prevent surfeits and other unfavorable conditions of the body ; and where they unfortunately occur, the evil should be obviated at once, by half ounce doses of sulphur, given three times daily, for the space of three or four days.

Another rule of equal importance is, *that where the fattening process is once commenced, it should be continued until the object is attained.* Frequent diminutions as to quantity, and changes in the quality of food, in these cases, will be found injurious, and produce a retro-

grade action, which it is extremely difficult to remedy. The frequent failure of endeavors to improve the condition of hogs that have once commenced *falling away*, is generally known. During the latter stage of fattening, hogs will eat less than in the former, and as soon as they cease to gain in weight, should be immediately killed.

In short, the business of fattening hogs with economy and expedition, is one that demands the constant attendance and supervision of the breeder; the more, as the course of a few weeks will determine the profits to be derived from those animals, in the purchase and previous treatment of which, he has invested a large share of his property.

We pass now to a more detailed consideration of those articles employed in the feeding, and especially the fattening of swine.

CORN. Whatever may be the food of swine, in their growing and maturing state, corn, when properly prepared, is undoubtedly one of the best articles for expeditious and successful fattening; and perhaps the one most generally employed in the practice of American farmers, for the nourishment of hogs at all ages. In the Western portion of the Union, especially, its great abundance and consequent cheapness render it one of the most economical articles to which the cultivator can resort. To secure its full advantages, however, it should be given in some form different from its raw state. It is

true indeed that, in whatever mode it is administered, it will support and fatten animals, but that the same amount, when ground and boiled or steamed, will go much further we have heretofore furnished ample proofs.

In the experiments of Mr Colman, given in the fourth chapter of this work, we learn that he fed ten hogs for the space of thirty days, during which time they gained fiftytwo pounds each, or more than two and a half pounds daily, on four and one half bushels of meal, prepared as hasty pudding. The allowance was two and a quarter bushels to each hog for the whole time, or (estimating a bushel of meal at twenty quarts after deducting two quarts for toll) four and a quarter quarts to each per day, at an expense of not quite two cents per quart when meal was seventyeight cents per bushel.

At another time by improving the mode of preparation and *producing by continued boiling in large quantities of water* almost the same quantity of from *one peck* that he had previously done from half a bushel of meal, he fed three hogs for the space of sixtythree days on five and a quarter bushels, the cost of which was \$3 94. The daily food of each in this case was nearly seven-eighths of a quart and the expense per day about two cents for each. The whole gain during the 63 days was 183 pounds. In this case the object of the experiment was not to *force* the thrift of the animals but to keep them in an improving condition.

In many of the Western States, during the present fall, corn has been sold at eighteen and three quarters cents and even twelve and a half cents per bushel, and twentyfive cents may be safely assumed as the average price of that article, so that the same amount (four and a half bushels which cost Mr Colman \$3 93) could in general be obtained there for \$1 31, and allowing even thirtyseven and a half cents as the price, the cost would be less by half than that of corn in Massachusetts.

According to the experiment of Mr Colman, where seven-eighths of a quart was found sufficient for daily consumption, a hog could be maintained, at the present low price of twelve and a half cents per bushel at little more than one-third of a cent per day, and at twentyfive cents per bushel at somewhat less than *one cent daily*. An allowance of four quarts, which should be ample in all cases if properly prepared, could be afforded at three and one-eighth cents per day. Thus one bushel at the cost of twentyfive cents, would be sufficient, after the deduction of the toll, or nearly so, to fatten one hog for eight days, or furnish the food of eight hogs daily.

Of the accuracy of the experiments made by Mr Colman there can be no doubt, and we introduce them as exhibiting conclusively the gain arising from the judicious preparation of corn. And similar results to those given by Mr Colman have attended the experiments of others.

Says a correspondent of the Farmer's Cabinet :* "On the first day of December shoats of the same breed, nearly of the same size, and as much alike in every respect as could be selected from a herd of ninety hogs, were made choice of ; each carefully weighed, and *placed in a single sty*, where their food could be exactly regulated. They weighed between 81 pounds and 100. The two, whose weight together made 185 pounds were fed one gallon of *shelled corn*, weighing seven pounds to each, for every twentyfour hours, and as much water as they wanted. This quantity of food was a plenty for them ; generally they about consumed it. Some five or six different days between the first of December and fourth of January, the time the experiment was going on, they did not eat their whole allowance."

"For the two shoats, whose weight together made 173 pounds, seven pounds of Indian corn meal, by measure ten pints, were made into good mush, or hasty pudding, and divided between them for every twentyfour hours. That is, these two had allowed them exactly *half the weight of meal* which the other had of raw corn. The seven pounds of meal were daily mixed with scalding water and then well boiled ; the whole process of cooking was done on an average in one and a half hours. The evening feed of the shoats, fed on mush, was

* Vol. 1, page 153—4.

generally warm ; the morning feed having stood all night was generally cold. The seven pounds, or ten pints of meal, when cooked weighed all of thirty pounds, and measured an average of three gallons. There was a difference of nine pounds in the (original) weight of the latter pair ; the smallest had the least appetite, and his allowance of fifteen pounds of mush was just as much as he appeared to want or would eat up clean ; the other was greedy and always sharp set, dispatched his mess quickly and wanted more."

" Before the experiment had progressed a fortnight there was a very perceptible difference in the appearance of these pigs. Those fed on the mush assumed a more thrifty, healthy, fresh appearance, particularly of their hair, and this difference became more striking as the experiment advanced."

" On the fourth of January while preparations were making for killing and dressing, they were again weighed on the hoof. One of those, then, whose daily allowance had been seven pounds of corn each had increased twenty pounds in the twentyfour days ; the other, which had an equal allowance, had increased only five pounds. I could not account for the difference by any thing I could discover, either before or after killing : the appetites of these two was much more alike than of the others, and their health was apparently equally good."

" Of the pair fed on mush, whose daily

allowance had been three and a half pounds of meal each, the greedy one had gained twentythree pounds, and the other twentyone pounds."

These are all the material facts in these experiments, except that a very small portion of salt was put in each mess of mush, and there is no miracle in them. The hogs allowed three and a half pounds of each gained less than three-fourths of a pound daily, and this surely they might have gained from the meal, but they gained more than those fed on double that quantity of corn. The saving of one half the immense quantity of corn consumed in raising and fattening hogs in Maryland, would be well worth the offer of a premium to have these experiments accurately repeated and tested by different persons.

VALUE OF THE COBS OF CORN. From the cobs as well as the kernels of corn may be derived a large amount of nutriment. Mr White, in a communication to the Cultivator,* relates as the result of experiments made by an extensive feeder in Philadelphia, that a bushel of meal, made of corn and cobs, was quite *equal* to a bushel of meal made of corn and oats, and that his cattle throve as fast as the former and never cloyed on it.

In the American Farmer† will be found a detailed account of a nicely conducted experiment

* Vol. 2, p. 88.

† Vol. 1, p. 324.

by P. Minor, Esq., of Virginia, to ascertain the amount of this nutriment. He took ten bushels of corn and cob, weighing three hundred and sixtyseven pounds, and ten bushels of shelled corn and subjected them to the process of distillation. The product of the corn and cob was thirteen gallons of spirits, and of the green corn eighteen gallons. Estimating that the ten bushels of corn and cob, would have given five bushels of shelled corn, which is the general proportion, there will be left as the product of the five bushels of cobs, four gallons of spirit, or nearly half as much as was afforded by five bushels of corn. Mr Minor remarks that the cob affords other nutritive matter than the saccharine, which is converted into alcohol, as mucilage and oils. We have besides abundant testimony in the practice of eminent farmers, of the utility of feeding cob-meal to animals always mixed, we believe, with meal of the corn or oats. Cob and corn meal is improved by scalding, still more for hogs by boiling, with potatoes, apples, and pumpkins. Mixed feed of this sort may be fed thrice in six hours. It is eaten in so short a time as to afford much beneficial rest to the animal.

But aside from the great nutriment the cob affords, its minute division and incorporation with the nutritive matter of corn, is valuable on the principle established by the French chemists,* of giving a *proper distention of the*

* See Chapter iv.

stomach, and thus lessening the amount of food required for the full support and nourishment of swine and other animals.

The Rev. Mr Perley, in a communication to the New England Farmer, thus describes his practice in this matter: "I have, for several years, practiced having my corn and cobs ground together, breaking the cobs first by pounding, and grinding one peck of corn with a bushel of the cobs. Meal made of this composition I scalded, and made about as thick as common hasty pudding, or mixed about one peck of the meal with about three pecks of boiled potatoes, thickened to the consistency of pudding. There were no hogs in the neighborhood grew so fast or were fit to kill sooner in autumn."

Mr Rice, of Shrewsbury, furnishes a statement in the Massachusetts Agricultural Repository, of an experiment made on a yoke of oxen, "So equally matched that no one who viewed them appeared satisfied which was the best. The food of one was in the proportion of two bushels of corn to one of oats, and of the other, the same amount of corn to one bushel of cobs. When taken to market and slaughtered, the oxen weighed twentyeight hundred and a half; the one fed on corn and oats had one hundred and sixtythree pounds of tallow, and weighed about half a hundred more. The one fed on cob meal had one hundred and sixtythree pounds of tallow, and the butcher pronounced his meat half a dollar on the hundred better than that of the other."

Mr Thomson, a distinguished southern agriculturalist, and the conductor of the Pattern Farm, near New Orleans, in conversation a few days since, with a friend of the present writer, remarked, that he invariably crushed both corn and cob, in a bark mill, and after steeping the meal, fed to his hogs and other stock. He remarked, also, that corn, fed alone, produced in general great acidity, *which the cob meal corrected by the quantity of potash it contained.* The benefit of this correction, is well understood by house-keepers of the old school, who so often burn cobs to procure good ashes to soak with meal, and thus destroy its acidity. So that in addition to the nutritive matter they contain, and their advantage in distending the stomach, cobs are highly valuable for the alkaline properties which they possess.

Those who desire to pursue this subject further, are referred to an article from the pen of Dr Meare, in the volume of the Transactions of the Philadelphia Society for Promoting Agriculture, where the utility of grinding the cob and corn together is clearly shown, both by analogy and experiment.

Cast iron bark mills, may be used to great advantage in cracking the corn and cob, where other mills are convenient, to continue the grinding afterwards. Much depends on the reduction of the cobs to a fine meal. Mr Buckminster, while speaking of machinery for this purpose says, "For making cob meal we placed in our

mill a pair of large stones, cut the eye of the runner, twelve inches at top, and fourteen or fifteen inches at bottom, and bosomed it out large, as we term it. In this manner it answers every purpose for grinding and cracking corn in the ears."

VALUE OF CORN STALKS AS FODDER.—The stalks and shucks of corn, as is proved by numerous experiments, are capable of affording no small amount of nourishment, and when cut into small pieces and steamed, may be employed with great advantage as the food of hogs. It is ascertained from close investigation, that when an acre of ground corn yields *one* ton of corn fodder and tops, it will also give two tons of corn stalks, and yet in the practice of many the possibility of using these articles as *food* for animals, seems to be entirely overlooked. Many intelligent farmers, says a writer in the *New England Farmer*, estimate generally the value of corn fodder on an acre of corn, yielding forty bushels to the acre, well cured and saved, as equivalent for the feeding of any stock to a *ton* of English hay, and not a few rate it even higher. But much of the nourishment to be derived from the corn crops depends on the mode in which it may be gathered. There are three prevalent modes of doing this. One is to top the stalks after the ear has become perfectly formed and slightly glazed.

The second method is to leave the crop untouched until it is perfectly ripened, and then to

cut it up at the bottom and carry it all into the barn and husk it. Some gather it in the field and then cut the fodder.

The third mode, is, after the ear is glazed and the corn has passed beyond the boiling or roasting state, to cut it up at bottom and let it dry in the shock.

The first method is liable to many objections. There is danger of performing the operation too early, and of sustaining a considerable loss from gathering the corn before it is sufficiently hardened ; and by either of the second modes the corn when thus left, is exposed to suffer from the frost, and lose much of its succulence and nutriment.

In the third mode it is found that the corn is taken away early from the reach of the frost and if properly managed ripens perfectly and weighs more by the bushel than if entirely dried as by the second mode ; and besides the corn fodder is dried with all its juices retained in it, and has a richness and freshness which renders it palatable to cattle, and as nutritive for beef or milk stock as any dry feed which can be given them.*

That the old method of *topping* stalks is erroneous, and should be discontinued, is proved by the results of many experiments. It is stated by William Carmichael, in the Farmer's Register, that he took promiscuously one hun-

* See N. E. Farmer, vol. xviii. 74.

dred ears from corn that had been topped, and the same quantity from that which had not been topped, growing side by side; the first weighed on the cob fifty pounds, and when shelled forty-one pounds, and measured twenty-one quarts one pint. The latter weighed fifty-four pounds, shelled forty-six pounds, and measured twenty-six quarts, showing a difference of nearly *one fifth* in favor of the unstripped corn. "Topping," says a writer in the Cultivator, "not only prevents the farther elaboration of the sap, but it deprives the grain of much that is already elaborated and on its way to the grain."

The late John Lorrain, a distinguished writer on agriculture, says: "In the process of topping and blading, one row was left entire, standing between the row that had been topped on the twentieth of August, and another row which was topped on the second of September. These rows were cut off by the roots on the third of October, and hauled in and set up separately under my own inspection. They were husked and measured on the first of November. Produce of the row that had *not* been stripped, *nine bushels and five eighths* of corn in the ear. One of the rows which had been topped and stripped measured *seven bushels and six eighths*, and the other topped and stripped row, measured seven bushels and three eighths of corn in the ear.

As the length of these rows was not given,

no *definite* idea of the difference can be obtained ; but in an experiment made by William Clark, Jr., of Massachusetts, the loss was *twelve bushels and forty-six pounds* per acre, from which he deduced, that about twenty per cent., or one fifth part of the crop, is destroyed by cutting the stalks in the way they are usually cut.

“ When soiling, that is, feeding with cut grass food,” remarks a correspondent of the Cultivator, “ forms any part of farm economy, we doubt not that corn sown broad cast, for this purpose, may be made to form a very profitable crop, either as a main dependence, or as an auxiliary to short or spare pasture. It gives the greatest burthen of green food and of as nutrient a quality as clover, though it can hardly be made to yield a cutting before August. It might well come in after clover as food for cows and pigs.”

Mr Holt, of East Haddam, Connecticut, has made some experiments in raising corn this way, for soiling ; and he has found that sixteen square rods of ground, sown with seed corn the twelfth of June, gave food and subsistence for a horse fifty days, and thirtythree days for a cow. An acre would, in this way, he thinks, feed thirty cows for a month.

OATS.—Experiment upon this most valuable grain, has proved that it may be advantageously used as a variety in the food of hogs. Its meal seems peculiarly adapted to young pigs, and is frequently given them, combined with that of

corn. Arthur Young speaks of this food in its natural state, as among the best grains for the younger class of hogs; and the author of the article on swine in Rees's Encyclopedia, remarks that oats are certainly very useful for those animals when coarsely ground and given in the form of wash, with water, or when made of a still thicker consistence.

Says a correspondent of the Cultivator, "A farmer of our acquaintance, and who is celebrated for the weight of his hogs and the excellence of his pork, is in the habit of mixing oats with his corn before grinding, in the proportion of about one fourth, and thinks if he had not oats of his own, he should be a gainer in exchanging corn, bushel for bushel with cats, rather than not have them to mix with his swine feed."

The grain in its raw state is acceptable to them also, but the preferable mode is to grind and boil or steam it. Boiled oats, when mingled with cut hay, have been found one of the best articles for fattening cattle *expeditiously*. The following experiment, is somewhat singular as regards the introduction of salt into the water where oats are boiling. Whether the same results attended its mixture at that time with other grains, we are unable to say,—the matter, however, is one deserving some experiments. "A few weeks since," remarks a correspondent of the Farmer's Cabinet, "a farmer who was desirous of salting his cattle, injudiciously put

about two quarts of salt into the boiler with the water and oats, and continued the boiling for the usual length of time, but with a very different result from what he had before experienced. In his previous boiling operations, without salt, the oats were much swelled and enlarged; but when the salt was present the grain refused to obey the usual law of absorption and enlargement, and continued about of their usual dimensions; the salt water remaining mixed with the oats in the boiler, but not absorbed by the grain. 'The first thought was, that the oats, being of a superior kind (the large potato oat) to that previously used, which was the common oat usually sown, the effect might be occasioned by the difference in the grain; but on trial since, without the presence of salt, with the same kind of grain, the usual swelling and enlargement took place. From this it appears evident, that salt or brine in some way produces the effect of preventing the grain from absorbing the water.'

The *Swine Oat*—known as the *Pilez* or *Pil-las* of agriculture, and the *Naked Oat*, or *avena nuda* of botanists,—is said, by a writer in Rees's Encyclopedia, to be cultivated to a considerable extent in Cornwall. It grows somewhat like the common oat, but the stem or straw is finer, and almost as good for hay as fodder. The grain is small, about the size of the common oat, but weighs as heavy as wheat by the bushel. This oat is an excellent article for pigs

and poultry. When designed as food for the former, one gallon of it combined with twenty of potatoes, form a very rich and fattening mixture. It should be ground and finely incorporated with the potatoes. The same writer observes however, that in some of the little hovels, or cottages, in the district where this oat was cultivated, the custom prevailed of strewing the whole or unground grain over the tops of the potatoes while boiling, and that the steam which arose, caused the oats to swell considerably, and rendered the mess peculiarly acceptable to swine.

The produce of the oat in flour, is generally regarded in the proportion of about 8 to 14, that is, 14 pounds of grain give 8 pounds of meal, although the proportional quantity of meal increases as the oats are heavier. According to Sir Humphrey Davy, "100 parts of oats, give 59 parts of starch, 6 of gluten, and 2 of saccharine matter."

It is, however, as a *variety*, and mingled with other articles, that oats are most advantageously fed to hogs—and the *economy* of their use in large quantities is questionable.

Rye and Barley.—Both of these articles are used as food for hogs; and their meal, like that of oats, may be frequently combined with other food advantageously. The meal of the former, is said to be peculiarly beneficial to young pigs, and calculated to preserve a healthy tone and action of the bowels. Barley

has long constituted one of the principal articles resorted to for feeding hogs in Europe, and is used for the same purpose to a considerable extent in this country. We learn that the sole food employed by Mr Pattison, while fattening hogs in stall pens, to which we have heretofore alluded, was barley meal and water. One of the successful modes of preparing swine for market in England is, to commence with a mixture of two thirds of boiled or steamed potatoes, and one third of peas and barley, ground in equal quantities into meal; and as the process continues, to diminish the former article, and add more of the latter. Malted barley given whole, has been found extremely beneficial in fattening hogs, as the quantity of sweet nutritious matter is greatly augmented. It is a food, however, generally best adapted to the elder class of pigs. The produce of barley in flour, is 12 pounds, to 14 pounds of grain, and 1000 parts of barley meal are found by chemical analysis to contain 920 parts of soluble and nutritious matter, i. e. 790 of mucilage or starch, 70 of sugar, and 60 of gluten.

LEGUMINOUS PLANTS.

BEANS AND PEAS.—“The seeds of the cultivated legumes,” says Loudon, “are considered to be *the most nutritious of vegetable substances* grown in temperate climates;” and of these substances those which we have placed

at the head of this division are undoubtedly the most nutritious. Beans and peas, form as large a portion of the food of hogs in Europe, as the maize or Indian Corn does in this country. It is a frequent practice, we are told by Low, in his Elements of Agriculture, to raise a quantity of peas with beans, generally about a half a bushel to the acre. This increases the value of the fodder, and greatly adds to the weight of the crop, and he adds, the grain of the bean is chiefly applied to the feeding of horses, though largely also to that of other domestic animals, and chiefly of hogs, in which latter case it is usually manufactured into a coarser kind of meal. "The meal of peas, according to Rees' Encyclopedia, when given to hogs, in the large quantities needed for fattening, are apt to heat them too much, and produce a difficulty of breathing; but for the large or full grown hogs, pea meal, or peas unground are probably the best material that can be made use of. A portion of the bean meal, or whole beans may likewise be given occasionally with advantage, as both these articles contain a much larger proportion of nutritious matter in the same bulk, according to Darwin, than any other sort of grain, and are more lasting in their effect on the system.

Oats and pea-soup, or the latter, are highly recommended by Mr Young, as the food of young swine. The mode of its preparation we have previously given in this chapter.

We have met with several statements from farmers in different portions of the United States, giving a detailed account of the good results arising from raising peas and beans together, and admitting hogs into the pastures thus prepared, to harvest these articles when ripe. This is said to be the practice in some portions of New York, and recent experiments in Connecticut, show a considerable profit in raising spring wheat in connection with oats, for the purpose of feeding swine.

The straw of both these articles is extremely nutritious, and esteemed by many, as much so as hay for horses.

The flour of beans, says Loudon, is more nutritious than that of oats for horses, and according to the respective prices of the two articles, beans and peas generally supply a cheaper provender than oats for all domestic animals. "In Leicestershire," says a writer, "they have a very easy mode of fattening great numbers of swine, which they do by stacking up their peas and beans, which they shape like to the form of a small cottage. This they set near some running brook, and hedge a yard in round about it, taking some part of the stream into the yard for the hogs to drink at; into which they turn such a number of hogs as they think their peas or beans will fat, where they let them lie till their provision is consumed, cutting the rick down and giving it to them as they can eat it. By this way, they fat very great numbers,

which they dispose of at London to the navy for sea. Sycamore leaves, beaten down while green and given to the hogs, will fat them very quickly.”*

The produce of beans in meal, is, like that of peas, more in proportion to the grain than any of the cereal grasses. A bushel of beans is supposed to yield fourteen pounds more of flour than oats, and a bushel of peas eighteen pounds more, or according to some twenty pounds. A thousand parts of bean flour were found by Sir Humphrey Davy to yield 560 parts of nutritive matter, of which 426 were mucilage, 103 gluten, and 41 extract or matter rendered insoluble during the process.

The produce of peas in flour, is as 3 to 2 of the bulk in grain, and when husked and split for soups as 4 to 2. An analysis of 1000 parts, gives 574 parts of nutritive matter, namely 501 of mucilage, 22 of sugar, 35 of gluten, and 16 of extract.”

BUCKWHEAT.—This is another of the leguminous plants cultivated for the farina of its seeds, which as the author of the Elements of practical Agriculture remarks, may be given to poultry and to hogs. The buckwheat is a plant of very rapid growth, and can be raised with facility on comparatively poor lands. Several writers recommend that it should be fed to hogs

* Vide whole Art of Husbandry by J. Mortimer 5th edition. Lond. 1721. pp. 250—251.

as a green crop, and harvested in that manner. According to Loudon, the *haulm* of buckwheat is even more nourishing than clover when cut while in flower. Bannister says that it has a peculiar inebriating quality. He has seen hogs after having fed heartily on it, come home in such a state of intoxication, as to be unable to walk without reeling. We are induced to believe that the value of Buckwheat straw as fodder, is too generally underrated. A writer in the 6th volume of the Cultivator, observes upon this subject, "the nutrient properties of the stems of all grain, are believed to be somewhat in proportion to the number of their joints, in which these nutrient properties are principally secreted, and the care with which they have been preserved. Our buckwheat straw, after a frequent long exposure in the field has been suffered to heat and spoil, as forage would heat and spoil under like treatment, and has consequently been considered as worthless for food. More careful farmers have preserved it as they would their hay, and have found it, if not as nutritious, at least worth preserving as forage. That buckwheat straw properly cured abounds in nutrient matter, is evidenced by the fact that when ploughed in green, it affords an excellent pabulum for stocks."

A correspondent of the Farmer's Cabinet, says, "A young Farmer asks us whether any use can be made of buckwheat straw! We answer that it is better (?) for milch cows than the

best timothy hay—that so far as the secretion of milk is concerned, it is infinitely preferable to any hay or fodder within our knowledge, and that when cut, boiled and steamed, it makes a more acceptable slop for the cows.”

This is certainly strong language, and although we are not prepared to follow the writer last quoted to the full length of his encomium, still we believe that this neglected article, if properly boiled or steamed, would be found capable of affording much nutriment to swine, and prove particularly serviceable to sows with young. In this latter case, it might be as valuable as lettuce or cabbages. It is certainly economical, and deserves experiment, as it secures the consumption of what is generally thrown away as refuse.

TARES.—The Tare crop is not one of general cultivation in this country, but in many parts of Europe, especially in Germany and England, it is cultivated to a great extent. The winter sown variety is said to afford most excellent food for swine, when admitted to harvest it in the spring. All the English Agriculturalists, remarks Low, are highly impressed with the value of tares. They are peculiarly adapted to milch cows, and hogs in many cases are fattened entirely upon them.

PLANTS CULTIVATED FOR THEIR
ROOTS AND TOPS.

The cultivation of root crops, is becoming more and more extensive from year to year in this county, and these substances are certainly to be regarded as *indispensable* auxiliaries to other articles in the nourishment and fattening of swine, as well as various animals. These crops are generally cultivated with great ease, and yield great products. As the winter food of swine, they are truly invaluable, and will amply repay the farmer for raising them in large quantities. Attached to every large establishment for feeding hogs, there should be a cellar, sufficiently deep and dry for the storage and preservation of roots during winter.

“Roots,” remarks a writer in the Cultivator,* “are less exhausting to the soil than grain; they are admirably fitted to form a part of the course of crops; are very beneficial in pulverising the soil; afford abundance of food for farm stock; may be substituted for grain, and serve to augment and improve the valuable product of the cattle yard. An acre of ground under good cultivation, will produce on an average, twenty tons of Swedish turnips, mangel wurzel, carrots, parsnips or potatoes; and supposing a lean animal to consume one bushel a day, and a fattening animal two bushels, the

* Vol. 2, p. 2.

produce of an acre will then subsist three lean bullocks 110 days, nearly the period of our winter, and three fattening ones 55 days."

Roots enter *largely* into the feed given hogs, by the most successful breeders in our country, especially in the Eastern States. Mr Ingersoll, whose success in the rearing of these animals is indeed remarkable, states that he feeds yearly, more than 5000 bushels of roots. We shall hereafter refer to the peculiar modes adopted by this distinguished breeder. His usual stock of hogs is about 150 ; and his farm consists of merely 21 acres, more than one of which is occupied with houses of various descriptions.

POTATOES, are one the most valuable articles given as the food of swine, either in their growing or fattening stage, and more generally enter into the various mixtures provided for these animals than any other of the vegetable substances. They are used either in their raw or prepared state, but for young pigs should in general be boiled or steamed. It is the practice of many farmers to drain off, with considerable care, the water in which potatoes have been boiled, on account of a deleterious quality it is supposed to possess. We have met with several statements in favor of the practice, and it is well known that the potato belongs to a poisonous family of plants, the *solanum*. The course to which we have referred, however, is recommended especially in the feeding of young pigs, as those of more advanced age, and particularly

growing stores, are not found to be injured by potatoes given in an uncooked state. That boiled potatoes, however, are best suited for the expeditious fattening of hogs, is verified, both by the experiments of Mr Walker, reported to the Highland Society of Scotland, which we have given heretofore, and the testimony of numerous agriculturalists in this and other countries.

Sinclair informs us* that potatoes yield much more nutritive matter per acre, than any other esculent; one third more than carrots; twice as much as ruta бага, and nearly three times as much as white turnips and mangel wurtzel.

"But experience," remarks a writer in that valuable agricultural periodical, the *Farmer's Register*, "has not been found to support these refined calculations of Sinclair, however chemically correct they may be; but it may be taken as a fair statement that a crop of potatoes of 400 bushels is double the best crop of Swedes; affords twice as much nutritive matter, and consequently should keep twice as much stock."

In the *Quarterly Journal of Agriculture*, June, 1834, are given statements of the results of trials in feeding raw and steamed food, which are seen to be conclusive in favor of the former in feeding cattle, and of the *latter* for pigs, and we find 140 pounds of turnips and 84 pounds of potatoes, yielding nearly the same increase of beef, keeping the relative value as two to one.

* Vide *Hortus Gramineus Woburnensis*, p. 388.

While writing on the article potato, Mr Low remarks that steamed food is not generally attended with the same benefit to ruminating as other animals, and that when thus prepared potatoes are given to hogs with the greatest effect.

The experiments of Mr Curwin, a distinguished agriculturalist of England, prove conclusively the great value of potatoes as food for stock.

CARROTS. It is the opinion of Mr Young that *boiled* carrots are not exceeded by any food for fattening hogs. The following various experiments are extracted from his "Prize Essays on Rearing and Fattening Hogs.

EXPERIMENT II.

At the same time, (March 1765) with the preceding trial, four lots of pigs, that had been weaned three months, were equally drawn from my farm yard, five in each lot. They were confined as before, each lot to a sty, and *cleaned* at the same time; their food was as follows.

- No. 1. Bran (wheat) mixed with milk.
2. Boiled potatoes.
3. Boiled carrots.
4. Raw carrots.

They were kept to this food thirty days and and then viewed as before with the same person.

No. 3. Much the best,—boiled carrots.

No. 1. Next—bran and skim milk.

2. Next—boiled potatoes.

4. Worst—raw carrots.

Boiled carrots appeared very clearly on this trial to be an admirable food for hogs of this age. Boiled potatoes appear also a good food.

EXPERIMENT VI.

In the month of December, 1766, twenty pigs that had been weaned a month, were draughted into four parcels and kept that month separately in the following manner.

No. 1. Boiled carrots.

2. Boiled potatoes.

3. Boiled turnips.

4. Boiled cabbages.

At the end of the month they were turned out and viewed attentively. The result was.

No. 1. The best—boiled carrots.

2. Next—boiled potatoes.

3 and 4. Equal—*all nearly dead.*

Carrots continue in every trial superior to all common vegetables. I am not surprised at the ill success of turnips and cabbages."

Various other experiments are detailed by Mr Young, exhibiting similar results, but those quoted are sufficient for our purpose. Carrots, undoubtedly are one of the best articles which a farmer can raise as food for swine, and are fed with great economy.

TURNIPS. Of the propriety of feeding the

common turnip to swine, great doubts are entertained. They have been found useful to cattle, but the general results of experiments made with this article for hogs, are similar to those of Mr Young. This remark, however, does not apply in its full extent to the Ruta Baga or Swedish Turnip—a vegetable which is occasionally given to swine, as a *variety*, with considerable advantage; and whose adaptation to this purpose is strenuously advocated by many judicious farmers. Still the use of turnips, as a substitute for potatoes, carrots, parsnips, and some other vegetables, will not in general be found an advantageous practice. The trial, however, is one easily made, and the article is one well adapted to inferior soils, and yielding large returns.

CABBAGES. Some of the remarks made in regard to turnips are also applicable to cabbages, and from the great abundance of grain in this country we are not driven to their use, as are the English farmers. For *sows with pigs*, cabbages are supposed to be good food, increasing in a high degree the secretion of milk. They are however best adapted for feeding in small quantities, and to vary other mixtures. Cabbages are plants requiring considerable attention, and are great exhausters of the soil; nor do they endure storing as well as turnips, and should consequently be consumed, nearly in proportion as they are pulled from the ground.

PARSNIPS. “The parsnip,” remarks Low,

“in its uses and the manner of cultivating it, resembles the carrot.” The soils to which it is adapted are more various than those assigned to the carrot, and its general produce is considerably larger. Hogs are extremely fond of it, and by some it is raised in large quantities for their use. Experiments have shown that carrots may be suffered to remain in the ground, during winter, sustaining little injury, and be taken up as food for hogs when their tops begin to sprout in the spring, and sufficiently early for the introduction of an after crop. In this way, the double advantage of feeding tops and roots is easily attained.

MANGEL WURTZEL. This is another vegetable of the beet family, used to a considerable extent, by many, as food for hogs. Notwithstanding its great nutritive powers, it is said to produce *surfeits* when administered as the entire food of swine, or in too large quantities. It is an article, however, of which growing stores are extremely fond, and one which the farmer will find it for his interest to provide for their consumption. When land is properly prepared, and this vegetable receives due attention, 30,000 plants are assumed as the yield per acre; which, if they are averaged at three pounds each, (an estimate sufficiently low) will afford nearly thirty tons of firm, nutritious food. The too general practice of removing the leaves of this plant is erroneous, as a loss of about six per cent. of nutritive matter will in all such cases be incurred.

SUGAR BEETS have received much commendation from those who have used them for the purpose of fattening animals. "I have observed in the Cultivator," says Mr Guthrie, "in a communication to C. N. Bement, Esq. of Albany, that you had great success last winter in wintering hogs on ruta бага. You have not probably given a trial to the sugar beet. From some experiments I am inclined to think that the French sugar beet will prove to be the best and most economical food for the hog to be found among the root tribe. I raised in the same enclosure, last summer, in the ratio to the amount of the ruta бага, of about 500 bushels, of carrots 937, and of French sugar beets the very large quantity of 2176 bushels to the acre. The soil and advantages of culture the same in each. The ruta бага was greatly injured by insects, *while the beet was without an enemy*. The cost of the sugar beets, which by the way, were almost as white and smooth as hens' eggs, scarcely exceeded one cent per bushel. I washed and sliced a quantity of ruta бага, carrots and beets, and fed all at once to my pigs, on a few occasions, and was induced to believe that the hogs gave the preference to the sugar beet. I am zealously preparing for the purpose, and intend to feed a few thousand bushels of French sugar beets another winter, *at all times thoroughly steamed*, with a slight admixture of bran shorts and ground screenings, and I have no doubt but I shall winter a herd

of hogs in this way at less expense than has ever been heretofore done."

The value of the *cake* remaining after sugar has been expressed is generally known. A calculation made by M. Iznard, Esq., French Vice Consul at Boston, gives nearly 8000 pounds of this article as the product of a single acre, after sugar of the first and second qualities had been extracted; and, owing to the extraction, by pressure, of the water contained in the original roots, this amount of cake is probably more valuable than a similar weight of beets fed directly from the field.

In addition to the articles of food already noticed under their respective class, there are several others, deserving the attention of the farmer.

PUMPKINS. These, as well as some other vegetables of the gourd tribe, are asserted by many to be an excellent food for hogs. As a *variety* they may undoubtedly be fed with great advantage; mixed with apples they have been frequently found to fatten swine expeditiously. It is recommended by some that when pumpkins are fed to hogs in large quantities, their seeds should be extracted, to avoid the *profuse staling* which they otherwise occasion.

SUNFLOWER. Loudon and other agricultural writers mention the sunflower as an article occasionally used in fattening hogs. With proper cultivation this article will yield 160 bushels of seed per acre, and it is admirably adapted

to exhausted soils. Its seeds are much relished by poultry, cattle and hogs, and a tea made from it is excellent in catarrhal affections of these animals. Its leaves and stocks, in the *green state*, are preferred by cattle to grass, and when cut up and steamed or boiled with cotton seed or a little meat, afford a delicious nutriment to hogs. Like those of the parsnip, its stalks and leaves are aromatic to the taste but possess far greater sweetness.

FLAX. A correspondent of the New England Farmer, while writing on the value of flax as food, remarks as follows. "Sometime in the month of February, my stock of hay was about all gone, and where to obtain more I could not tell. It could not be had short of twenty miles, and then at the price of \$30 per ton."

"One day I went to the stable, and no sooner had I entered than every eye was upon me for aid. You may imagine what my feelings were when I knew of no relief which I could bestow. I stood awhile to reflect on what course to pursue or what to do. At last I thought of some flax which had been lying on the beams of my stable for several years which had not been rotted. I threw down a few bundles and gave some of the flax to my cattle. They took hold of it with such eagerness that I was obliged to take it from them, to prevent their being choked with it. I then took a block of wood and a broad axe, and chopped it up short,

gave a very little to my cattle and continued to do so until it was all gone.

“From what I then discovered of the virtue of the oily substance flax contained, I am of opinion that what I could take up between my hands, after being chopped and given to a cow, would carry her through the foddering season. My opinion is that the bulk of one ton of hay in flax will be of more value to a stock of cattle than four tons of hay.”

Mr Nathaniel Landon, of Litchfield, Connecticut, says, that he boiled two quarts of flax seed, and sprinkled it on cut straw, which had been previously scalded, and seasoned with salt, together with some oil cake and oatmeal; working them into a tub with a short pitchfork, until the whole became an oily mush. With this mixture he fattened several cattle, and is of the opinion that his nett gain was more than all he had cleared before for fifteen years, in raising cattle and cows, and was to be attributed principally to the flax seed.

The peculiar fattening properties of *oil cake*, aside from the doubly rich dung it gives, are universally known; and as food for hogs its use is very general. It is asserted, however, that in consequence of the high price at which corn is sold, *Linseed Jelly* is taking the place of it in England. The mode of preparing this jelly (and we recommend it highly to our readers,) is the following:—Take seven parts of water to one of flaxseed, and *steep* the latter in part of

the water for forty-eight hours ; then add the remaining water cold, and boil gently two hours, stirring the mixture constantly to prevent its burning. It is cooled in tubs, and given mixed with meal, bran, &c. Hay, meal, and linseed jelly, are accounted an excellent mixture for fattening hogs.*

ARTICHOKES are uncommonly nutritious, and can, doubtless, be cultivated with advantage for the food of hogs. In their raw state they are not in general acceptable to swine, but when steamed, *are eagerly devoured in preference to potatoes*. A writer in the London Farmers' Magazine, who instituted experiments to test the relative value of artichokes and potatoes, as affording nutriment to cattle, remarks, " One sack was consumed by a young calf at hand ; it ate them with avidity, and improved on them. I set them without cutting—measuring correctly the eighth part of an acre ; the produce was in proportion to 630 bushels per acre, the potato 327 bushels. The following year (the memorable one of 1826), I planted half an acre on a piece of thin gravel—old tillage land, in its regular course of preparation for a vegetable crop after wheat ; they maintained their verdure through that extraordinary dry summer, and produced 150 bushels ; but the potatoes by the side of them were completely set fast ; they never formed a bulb. The year following I set

* Vide Bordley's Essays on Husbandry, Phil. Ed. 1799.

an acre on a part of the same kind of soil, but of better quality; it produced 570 bushels, *without any dung*. A half acre of the same land, with the usual quantity of dung for turnips, produced 290 bushels, (a bad compensation for eight loads of excellent dung.) This present year, an acre of the same land (part of my turnip-fallow), produced 576 bushels, but the wet state of the soil when taken up, and being a vegetable of uneven surface, which causes the soil to adhere to it more than to a potato, render it difficult to come at the exact quantity. From an experiment I have made of washing a sack, I can safely assert I have 530 bushels of clean roots; whilst the vegetables in our flat gravels do not equal this by full fifty per cent., except the potato, which produced 308 bushels on the same soil. I never could raise more in favorable seasons."

"The cultivation of the artichoke is the same as the potato, except that it requires to be set early, not later than March. If laid above ground all winter, it is proof against the severest frosts. When once cleaned, no weed can live in its dense shade; horses, cattle and sheep, consume it with avidity; pigs prefer a potato to it in its raw state, but prefer the artichoke when boiled or steamed."

"If potatoes can be profitably cultivated as food for stock, compared with Swedish turnips, mangel wurtzel, the sugar beet, &c., the artichoke is vastly superior to them. The

expense of culture is no more ; it is not liable to be injured by frosts ; can be taken up at pleasure ; it produces at least thirty per cent. more, and on poor land fifty per cent. ; *is far more nutritious*, and leaves the land perfectly clean. The only objection that can be raised against their cultivation in competition with potatoes, is, that they require more care in taking them up. The frost not acting upon them so as to destroy vegetation, what are missed will, of course, grow among the succeeding crop ; but little inconvenience will result in this respect."

We should be much gratified to learn the results of accurate experiments in feeding this nutritious article to swine. In the western portions of our Union, especially where large quantities of artichokes are frequently found growing in a wild state, and scattered over extensive tracts, the trial might easily be made, and their virtues, when boiled or steamed, correctly ascertained. If useful at all, they will undoubtedly be found so in a high degree.

ACORNS.—The value of these articles for swine, and the avidity with which they devour them, are generally known. It is stated by the author of *Modern Agriculture*, that in many parts of the forest districts of England, beech mast, and acorns are much used, not only as food for growing hogs, but also as a means of fattening them. In the former case, hogs are driven into the woods, and allowed to range for a considerable portion of the year, as well as

in autumn; in the latter, those intended for slaughter at the end of the year, are brought home from the forests soon after the fall of the acorn and beech mast is over; they are then put into styes, and their fattening is completed with the same sort of food—a great quantity of which is collected by poor people, and sold to the farmer for the purpose. They are esteemed as especially useful when mixed with beans and peas and barley meal.

We are not aware of any experiment as yet, in boiling or steaming acorns before they are fed to hogs. Such experiments, however, are well worthy the attention of farmers, and particularly of those residing in the western states, where immense quantities of these articles, as well as the beech mast, can be obtained with a slight trouble in gathering. If they are to be fed for the purpose of *fattening* swine, it is certainly advisable that they should be collected and given to these animals in their pens; thus securing that rest which is deemed necessary to the most expeditious increase in flesh, and avoiding the numerous accidents which attended the questionable practice of allowing large herds of hogs to run at large. We presume that all kinds of acorns will be found of equal use, though those of the *white oak* have in general been preferred.

DISTILLER'S GRAINS are used extensively in this and other countries for the purpose of fattening animals. "It is stated," says the

author of the article on swine, in Rees's Encyclopedia, "that in the county of Surrey between nine and ten thousand hogs are fattened annually on the grains, wash, and other offals of three distilleries only in that district. In the *first* stage of fattening they are only allowed grains and wash ; but for some weeks before they are ready for market, they are permitted to have daily a certain quantity of meal or grain ; this not only brings them faster forward, but renders their flesh firmer, and better adapted for curing as salt provisions."

But the same writer thinks that perhaps of all the modes in which hogs are fattened, that adopted at the corn mills and starch works is the best ; while the food on which the hogs are fattened (the refuse of grains) is freest from any nauseous mixture ; and more nutritive than any other that is applied to the same use. "It is desirable also," he continues, "to correct an error too generally believed, that the *malt-distillery pork is not good* ; the hogs, it is asserted, being kept in a state of intoxication ; whereas the *contrary is the fact*. It is notorious, that the best pork for sea voyages is that from the malt distillers, who always finish them with hard meat ; and it is equally certain that the best bacon in the kingdom is made from those hogs, and he would be a bad workman who left spirit enough in his wash to make his hogs drunk. It, indeed, is not probable that this prejudice is well founded, since upon inquiry it has been

found, that the hogs fatted at the distilleries fetch the same price, both at the bacon merchant's and victualling office, as any others."*

HAY TEA.—The use of *hay tea* in the store-feeding of hogs, we learn has been attempted by Mr Saunders, of Stroud, Gloucestershire, with much success.† He was led to the use of this liquid from considering its effects in weaning calves. In his experiments, as stated in the Agricultural Magazine, the sorts of hay made use of were clover, sanfoin, and lucerne, and he thickened the tea or wash, indiscriminately, with either grains, or bran, or pollard, or any kind of meal, or boiled cabbages, or boiled potatoes, (carrots, though excellent, he had none,) sometimes adding two or more of these articles, as his stock of either most enabled him. And he had the great satisfaction to find, that he made a single sack of boiled potatoes, when mixed with this tea, and without any other ingredient, *go as far as four or five sacks—though boiled*,—when he gave them to the pigs alone; *and the expense of the wash, thickened with potatoes, was considerably lower than the potatoes alone.*

With the view of showing the practicability of prosecuting the plan individually upon a larger scale, he gradually increased his stock to upwards of four hundred; and in the course of his experiments, he used nearly fifteen hundred

* Vide Rees's Encyclopedia, article swine.

† Ibid.

hogsheads of the wash, consuming, when his stock was at the highest, about five hogsheads daily. And, incredible as it may appear, he maintained them, collectively, at the very low rate of *one penny a head* per day ; in excellent store order, and many of them fit for the butcher.

It deserves particular attention, he says, that in a week or fortnight after he commenced his experiments, the pigs which he had before been feeding with potatoes alone, improved in their coats, which, from looking coarse, assumed a gloss, and became fine and short ; a proof surely, it is thought, of the great nutrition of the food, and of its perfectly agreeing with the hogs. Nor is it less remarkable, he observes, that this voracious animal, though fed with this food but *twice* a day (which he prefers to oftener), would lie down contented for the remainder, provided he was well ringed, and had a warm and dry place to shelter himself under. And this he attributes to the following causes, besides the nutritive power of the wash. He found it beneficial to store the potatoes in large casks (in which, he conceives, they would keep good above a twelvemonth,) and when they had remained in them some time, freed from the water they were boiled in—which is considered noxious,—they not only went further, but they generated a spirit ; and the wash being also, as he apprehends, of considerable strength, they disposed the animal to betake himself to rest,

from their soporific and intoxicating qualities ; a circumstance evidently conducive to his quicker growth.

Nor can an objection be raised, it is supposed, to this food when applied to the flesh of the animal. So far from possessing any pernicious quality, it communicates perhaps a richer and more delicate flavor to the pork and bacon, than they receive when fed after the common mode ; and the butchers and others, not only eagerly purchased his pigs, but commonly remarked, that they rapidly improved when put up to fatten. And hence, he says, arises another most important consideration. He is confident he could make one sack of meal, of whatever description, go as far as two sacks in the common mode of fattening. For by gradually thickening the wash with meal, it forms the best introduction to the higher and last stages of fattening, both for pork and bacon ; indeed, this method should be followed throughout the process, using the wash instead of water. The increased quantity of a cheap and highly nutritious food, thus administered, will satisfy the voracious habits of this animal, and yield the greatest profit ; and this alone would cause an immense annual saving of corn, which would tend to ensure plenty and cheapness ; the grand desiderata in all experiments.

He further observes, that clover or sainfoin hay, at £4 13s. 4d. per ton, is 4s. 8d. per hundred, and one halfpenny per pound ; and that

twenty pounds of either when boiled, will make with the addition of the incorporating ingredients, sufficient wash or food to maintain throughout the day *fifty* store pigs, from three months old to an indefinite age upwards.

It is remarked that carrots either raw or boiled are excellent, and these with oat meal and grains, would make a cheap and good addition. The hay when put into the furnace to boil should be enclosed in a net, or basket, with a lid to it, or in a tin kettle and cover, filled with large holes; while the potatoes or carrots, &c. should be steamed over the hay tea while gently boiling or simmering. This may easily be done by fitting to the furnace a vessel having a number of holes of the size of a common auger bored through the bottom of it, so as to allow the steam to pass through the potatoes, with which the vessel is filled; and having a little moist clay, or a wet flannel, or cloth put circularly around the bottom, when it rests on the mouth of the furnace, so as to secure the steam from escaping. By this mode of steaming the potatoes, a considerable saving will be made in fuel.

The potatoes should be slightly steamed or boiled, and not reduced to pulp, and while hot, should be trod or rammed in casks for future use. The hay, after boiling, may be dried and perhaps offered to the store cattle, or else thrown to the pigs as litter, or to add to the dung heap. The wash should be carefully

given to pigs in a *luke-warm* state, and if meal be added, it should be thrown into the tub, or cooler, immediately after boiling the wash, and both should be well mixed together ; but steaming the meal and even the grains, might be a still further improvement. The water, where there is sufficient fall, may be led into the furnace without any trouble whatever, by means of a leaden pipe ; or may be conveyed into the furnace by a spout from the pump ; and the tea may be drawn off through a cock into a cooler, which should be placed by the side of the furnace. To carry the wash to the pigs, use is made of an open barrel or hogshead suspended upon a pair of shafts, with wheels to it, and drawn by a single horse.

But it is added, that in the estimates of the expense of maintaining the pigs, it should be observed that no credit is allowed for the article of manure, and thus they will make the farmer a present of their dung, as well as pay him a good price for their keep. Fifty strong stores with a sufficient quantity of stubble, or carpenter's shavings, or saw dust, or virgin earth, or sand, especially sea sand where obtainable, laid down in the yard, will make, he says, in the course of the year, from two to three hundred wagon loads of excellent manure. The sea sand will add saline particles to the manure, and check evaporation. And another favorable circumstance is, that the hay-tea *binds the dung of swine*, and renders it hard and black, like

sheep's dung ; and if it does not produce this effect, it must assuredly be either bad in quality, or not properly boiled, or not rendered sufficiently strong ; all which particulars should be most carefully attended to ; and the state of the dung is an excellent guide to go by. The hay should be of an excellent quality ; and that which is heated best and contains most of the saccharine juices should have the preference. Bad hay is certain destruction to the pigs. Clover stands first, next sainfoin, and lastly, meadow hay. Indeed, most of the experiments we made, he says, (though not by choice) with meadow hay.

Loudon, in his valuable Encyclopedia of Agriculture, gives the following directions for the preparation of hay tea. " Boil at the rate of a handful of hay to three gallons of water, or if the water be poured boiling hot on the hay it will answer nearly as well. Give to cattle and horses to drink, when cold ; or if the cattle and horses are any way ill, and under cover, give it to them blood warm. This drink is so extremely nutritive, that it nourishes cattle astonishingly, replenishes the udder of the cow with a prodigious quantity of milk, makes the horse stale plentifully, and keeps him healthy and strong."

In these remarks, reference is had rather to the occasional and medicinal use of hay-tea. The directions necessary for its preparation as food for hogs, it is believed have been exhibit-

ed with sufficient clearness. It appears from the statements of Mr Saunders, that the hay used in his experiments was rated at a value of more than \$20 per ton, and the results of its administration in tea, even at that price, are indeed astonishing. But in many portions of this country the price of hay is often less than half of the sum mentioned; and the cost of feeding it to hogs would be proportionably reduced. At a cost of \$10 per ton, the quantity assumed by the experimenter as sufficient, when combined with the articles mentioned, for the full sustenance of fifty store hogs daily, could be furnished at the extremely low price of *one half a cent* per pound, or 10 cents for the whole; and in many cases for two thirds, even of this small amount. And the same quantity calculated as the daily food of a horse (28 pounds) would support, when properly prepared with carrots, artichokes or potatoes, this large number of pigs for 24 hours, or one pig for fifty days.

It is suggested for the consideration of farmers in the Western States, whether advantageous results might not be anticipated from the use of hay-tea, prepared from the wild or prairie grasses. Though considered, and deservedly so, inferior to any of the cultivated kinds, they still form most of the nourishment provided on many farms for the consumption of stock throughout the winter. The experiment at all events, in regard to clover, and other superior grasses, is one richly deserving the attention of the economical stock raiser.

APPLES. It is remarked by a correspondent of one of our most valuable periodicals, that "the feeding of apples in rearing and fattening animals is one of the successful and happy innovations of the age;" and the experiments of many on this subject truly exhibit the most flattering results. The editor of the Monthly Genesee Farmer,* under the head of "Apples for fattening hogs," remarks as follows. "Although the attention of our readers has been before called to this subject, we believe its importance is too little appreciated generally and we shall lay a few more facts before them, showing the advantages of employing apples as food for fattening hogs over other substances. We shall first endeavor to show that they are a *valuable* kind of food, and secondly a *cheap* one."

"First, with regard to their *value*. A correspondent of the Maine Farmer, in 1834, made the following experiment. He commenced feeding his hogs on apples in August. A pig four months old and weighing ninetyfive pounds, was fed eighteen days as follows. First two bushels of *sour apples* boiled with six quarts of oats and pea meal, weighing four and a half pounds, were given him. At the end of six days he had gained *six* pounds. He was then kept six days on the same quantity of boiled *sweet* apples and meal, at the end of which

* Vol. i, 145, 146.

time he had gained *six* pounds more. He was next fed on an equal quantity of boiled *potatoes* and meal, and at the end of six days he had gained only five pounds. Here the superiority of both sweet and sour apples over potatoes was decisively shown."

"A correspondent of this paper at Lockport, in a communication last winter, states that he shut up seven hogs about fourteen months old, on the first of October; they were in poor condition and estimated to weigh about 150 pounds each, and worth in the market two and a half cents per pound. They were fed fifty days on apples, mostly sour, boiled with a small quantity of water, with the addition of a bushel of bran and a pint of salt, to three bushels of apples. At the end of fifty days they were fed with twelve and a half bushels of soft corn in the ear, and afterwards slaughtered. The average weight of each was 272 pounds. Estimating the apples at twentyfive cents a bushel, the bran at six cents and the corn at sixtytwo and a half, the whole expense was \$77 55, and the pork at \$6 25 per cent., \$119, leaving a clear profit of \$41 45.

These experiments, it will be observed, were with *cooked* apples. The practice has also succeeded when they have been fed in a raw state, though the latter is not as profitable, except on a very small scale, when the trouble and expense of cooking would be comparatively great.

In the following experiments the apples were given uncooked.

"A correspondent in Onondaga County, turned thirty hogs, and from thirty to forty shoats and pigs, into an orchard of 400 trees about the 15th of September, and they remained there until the latter part of November, when they were slaughtered, with the exception of twelve dollars worth sold alive, and about a dozen retained as store pigs. They yielded about 4,450 pounds of first rate pork, fattened on apples wholly, without any grain. This was the fourth experiment of the kind made by the writer, all of which were attended with complete success."

In the fourth volume of the *Genesee Farmer*, S. P. Rhoades, of Skeneateles, says: "A friend from Massachusetts informs me that he shut up a hog by himself, and fed him entirely on *apples* and *water*, last fall, and that he became very fat, was well filled, and the pork was hard and sweet as that fed on corn. He also states that when turned into an orchard where there are both sour and sweet apples a hog will eat about as much of one as of the other."

In the *Brattleboro' Messenger* a correspondent says: "A man in Guilford, conversing on this subject, said to me, 'There is a hog that will weigh over two hundred; I brought it home in July on my back. I have given it nothing but apples and a little slop for drink.'"

Secondly, with regard to the cheapness of this kind of food. This may perhaps be best

determined by calculation. We will suppose that an orchard is planted on an acre of ground, and the trees stand at a distance of twentyfive feet asunder, which would not be too near where they are merely intended for this purpose. This would give about seventy trees to the acre. The trees, at twentyfive cents each, would cost \$18 75; and the expense of planting, supposing each tree to cost ten cents each, would be \$7. While the trees are small the land may be tilled and will produce as much as before; and from the time they begin to bear, they may be considered as paying for the ground they occupy by their fruit. Such an orchard, therefore, in a good bearing state would cost as follows:

One acre of land,		\$50 00
Seventy trees,		18 75
Planting,		7 00
		<hr/>
		\$75 75

The annual interest on this sum, at seven per cent., would be \$5 30, which would be the actual expense of each crop, as the pasture of the ground would pay for gathering. If each tree bears on an average five bushels a year, (this is a *low* estimate if the most productive varieties are selected) the animal crop would be three hundred and fifty bushels, which, according to the preceding calculation, would be at the rate of *one cent and a half* a bushel. Estimating the cost at double this, the clear profit

in the second experiment before stated, instead of being \$41 45, would actually be \$74 75.

One of our neighbors last year, made forty dollars, from a small orchard of about an acre, by fattening hogs, and reserved a large supply of apples for winter and other use.

A writer in the Farmer's Register remarks: "Hogs care nothing for corn if they can get apples; if sweet, the apples may be given without boiling; if sour, they must be boiled. Mixed with corn meal the flesh is firmer."

These are only few of numerous experiments, exhibiting the same results, which, did our limits allow, we could easily place before our readers. We have met with several statements of the great nourishment derived from *apple pomace*, generally esteemed as worthless, but which was advantageously used by a correspondent of the Cultivator, in fattening hogs.*

Owing to the general scarcity of orchards in the Western States, the use of apples as food for stock cannot at present be extensive. The calculations given by the editor of the Monthly Genesee Farmer, are, however, worthy the attention of stock raisers in that portion of our country, for while the original cost of the trees may be more than the estimate given in the Cultivator referred to, that of the land will be diminished in many cases four fifths.

* Vide Cultivator, i, p. 152.

CHAPTER VI.

Exhibition of the modes pursued by various distinguished breeders, in the management of swine--Diseases of swine, and their remedies—Manner of killing hogs—Curing hams—Erection of smoke houses—Packing pork, &c. &c.

IN continuance of our remarks in the preceding chapter, we proceed to an exhibition of the various modes pursued by successful breeders, in the management and fattening of swine.

“One of the best establishments,” remarks Mr Colman in his Second Report on the Agriculture of Massachusetts, “for fattening swine, I found in Great Barrington. This farmer, whose whole management is excellent, fatted, the year before last, twenty four large hogs. The current year he has fatted twenty five, and their average weight was 318 pounds ! Whole weight, 7950 pounds. His mode of fattening swine deserves attention. As soon as the pastures will afford a good bite of grass, he turns them in where they can have plenty of clover and water. He is careful to salt them once a week, or oftener, if the season is wet ; and changes them from one pasture to another, as he does sheep or other stock, which is of much importance during the summer. As soon as he gathers his harvest, he gives them the stubble. When it is well gleaned, he gives them corn cut up by the ground for a few days, as it is dangerous to keep them closely shut up and feed them highly in the beginning ; having no exercise, it tends to produce the blind staggers. In order to remedy this, they must be put on thin feed and have as much salt as they will eat. He commences

steaming potatoes, for his hogs the first of October; his ruta bagas not being then matured; he mashes them fine, puts nothing with them but the sour milk from six cows, and four quarts of salt to a box of twenty eight bushels. This feed he continues three weeks. Afterward he commences steaming ruta бага, and continues this feed until the first of December, which is five weeks. He puts with the ruta бага, after being mashed fine, four quarts of salt, and three bushels of oats and peas, ground together into a box containing twenty eight bushels. On this feed they do extremely well. This feed he continues until the 25th of December, and then finishes off with meal and corn. The free use of salt is unquestionably of much advantage.

“A very successful fattener of swine in another county, whose authority in this matter is decisive, is in the habit of boiling corn in a large vessel, and with the mixture putting in *a few quarts of wood ashes*. The proportions I cannot exactly ascertain; but he considers its use once a day of great benefit to the health and appetite of his swine. He is careful likewise to put charcoal into their styes once a week. A finer stock of swine or a finer display of fattening swine, I have never seen, than I have seen at this farmer's place, which is certainly a conclusive test of the excellence of his management.”*

“The practice in Scotland,” remarks Fessenden, “is to rear swine chiefly on raw potatoes, and to fatten them on these roots, boiled or prepared by steam, with a mixture of oats, barley, or bean and pea meal. Their trough should be often replenished with a small quantity of food at a time, and kept always clean, and seasoned occasionally with salt.”

* Vide Second Report on Agriculture of Massachusetts.

If one wishes to fatten hogs, and either from indolence or too much occupation, does not expect to give them a constant and regular attention, perhaps he may adopt to advantage the following mode pointed out by an English writer.

“Mr John Adams of Cherrington, near Newport, Shorpshire, has fattened eight pigs in the following cheap and easy manner. He places two troughs in the sty; one he fills with raw potatoes, the other with peas, and gives no water; when the pigs are dry, they eat the potatoes. The eight pigs were fattened so as to weigh from sixteen to twenty score each, and ate no more than thirty bushels of peas, and about two hundred bushels of potatoes.”

Another writer says, “they fatten all their pork in the island of Jersey with parsnips. They are much more saccharine than carrots, and it is well known that nothing fattens a hog faster or makes finer pork than the sugar cane.”

Cunningham, in his ‘Two Years in New South Wales,’ relates, “I have often heard it said among sailors that pigs would fatten on *coal*, and although I have observed them very fond of munching up the coals and cinders that came in their way; still I conceived they might relish them more as condiment or medicine, than food, till I was assured by a worthy friend of mine, long in command of a ship, that he once knew of a pig being lost for several weeks in a vessel he commanded, and it was at last found to have tumbled into the coal hole, and there lived all that period without a single morsel of anything to feed upon but coals. On being dragged out it was found as plump and fat as if it had been feasting on the most nutritious food. When we consider coal however to be a vegetable production, con-

taining the constituent principles of fat, carbon, hydrogen and oxygen, our surprise will decrease."

An Ohio farmer, also recommends coals as useful in fattening hogs. After giving his hogs a small quantity daily, say two pieces to each, about the size of a hen's egg, they *discontinued rooting*, were more quiet and appeared to fatten faster. He omitted the coal a few days, and they commenced rooting; he gave it again, and they ceased to root. He supposes that the coal corrects the morbid fluid in the stomach, which incites them to root deep in search of fresh earth.

The following mixture for fattening swine has been recommended. "Wash potatoes clean, boil and mash while hot, mix at the same time oats and pea meal; put the mixture into a large tub, which must stand till it becomes sour, but not putrid, and keep a quantity of this on hand, always fermenting, and give it to your hogs as often as they will eat."*

We have several times alluded to a custom existing in the Western states, of turning large herds of hogs into a corn field, for the purpose of fattening them. The following letter from the Hon. O. H. Smith, of Indiana, will explain the practice still more fully.†

"A statement of my own operations, for a few years past, will partly illustrate the process adopted in that part of Indiana where I reside, in the pork business. I have had in cultivation in corn, for several years past, 160 acres of river bottom lands. The most of these lands have been in cultivation in corn about fifteen years, without intermission and without manure. The average crop has been since

*Complete Farmer, p. 162. †Vide "Upper Wabash Valley," by H. W. Ellsworth, p. 39, 40.

I have tilled them, about 65 bushels of corn to the acre. I plant my corn generally, about the first of May; it is laid by about the middle of July, and by the middle of September, it is sufficiently hard to commence the feeding of my hogs. At this time, I purchase, of those who raise them, the stock required to eat of my corn: say about 3 1-2 hogs to the acre, which is about the proper number to eat an acre of corn in thirteen weeks, the usual time allowed to make our pork from ordinary stock hogs.

“My course of feeding is this. My fields contain from 20 to 30 acres each, all well watered. At the proper season I turn my hogs into a field, and after it is eaten off clean, I pass them into another, and so on, until I have fed off my crop, when my hogs are ready for market. The profits of the operation depend much on the price and quality of the stock, and the price pork may bear in the market. But, for several years past it has been an excellent agricultural business. When I first commenced feeding this kind of stock a few years ago, I very naturally supposed, that, by turning them into the field of ungathered corn, great waste would be the inevitable consequence, and I had my corn pulled and fed to them in a dry lot. But I soon became satisfied, by inspecting the operations of my neighbors, who had been for years in the business, that my labor, and expenses of feeding in this manner, were entirely thrown away, and I abandoned it. Hogs gather corn in the fields, with little or no waste, provided the fields or lots in which they are fed, are proportioned in size to the number of hogs fed upon them, which should be in the proportion of 100 hogs to five or six acres of corn. The hogs should be *regularly salted*, while feeding, and running water

should be accessible at all times to them. By feeding in this way, I found that my hogs improved more rapidly, and my lands increased in value yearly, although I never put a shovel full of manure on them.

“Being much from home, and not having a disposable force to tend or farm my land, I have for years paid \$3 50 per acre for tending it, the persons farming the corn being at all the expenses. This is about a fair compensation for such services.”

Elias Phinney, Esq. of Lexington, Mass., in corresponding with the Hon. H. L. Ellsworth, of Washington, remarks as follows.

“I have been for a number of years engaged in the rearing and fattening of swine, and my establishment is viewed as one of considerable magnitude, when compared with others in this part of the country, but when compared with those in the Western States, it must be very diminutive. A late writer, in the *Yankee Farmer*, which you may have noticed, has greatly exaggerated the profits of my piggery. The average price of corn in this market is \$1 per bushel, and potatoes, 33 cents;—at these prices my sales of pork have always exceeded the expense of keeping, and given me a handsome profit, besides the manure taken from my sties, which is of great value on my farm,—usually not less than 500 cart loads annually.

“In some cases, my best pigs, upon 4 quarts of Indian meal, with an equal quantity of potatoes, apples or pumpkins, well cooked, have been made to gain *two* pounds a day. At this rate, it may be seen, there is a profit in fattening pork at the above price of grain.

“The older class of pigs for the first ten or twelve

months, are kept principally upon brewers' grains, with a small quantity of Indian or barley meal, or rice, ruta бага, sugar beet, &c., and in the season of clover, peas, oats, cornstalks, weeds, &c., they are cut green and thrown into the pens; the next four or five months before killing, they have as much Indian meal, barley meal or rice, with an equal quantity of potatoes, apples or pumpkins as they will eat, the whole being well cooked and salted, and given to them about blood warm. During the season of fattening, an ear or two of hard corn is every day given to each pig. This small quantity they will digest well, and of course there is no waste. Shelled corn soaked in water made as salt as the water of the ocean, for 48 hours, with a quart of wood ashes added to each bushel, and given to them occasionally in small quantities, greatly promotes their health and growth. Their health and appetite is also greatly promoted by throwing a handful of charcoal once or twice a week into each of their pens. Their principal food should, however, be cooked as thoroughly and as nicely as if intended for table use. From long practice and repeated experiments, I am convinced that two dollars worth of material, well cooked, will make as much pork as three dollars worth of the same material given in a raw state.

“If intended for killing at the age of nine or ten months, they should be full fed all the time and kept as fat as possible. If on the other hand they are intended for killing at the age of 15 or 18 months, they should not be full fed, nor be made very fat for the first 10 or 12 months.

“To satisfy myself of the benefit of this course, I took six of my best pigs, eight weeks old, all of the

same litter, and shut them in two pens, three in each. Three of these I fed very high and kept them as fat all the time as they could be made. The other three were fed sparingly, upon coarse food, but kept in a healthy, growing condition, till within four or five months of the time of killing, when they were fed as high as the others. They were all slaughtered at the same time, being then sixteen months old. At the age of nine months, the full fed pigs were much the heaviest, but at the time of killing, the pigs fed sparingly, for the first 10 or 12 months weighed, upon an average, fifty pounds each, more than the others. Besides this additional weight of pork, the three "lean kine" added much more than the others to my manure heap.—These results would seem very obvious to any one who has noticed the habits of the animal. In consequence of short feeding they were much more active and industrious in the manufacture of compost, and this activity at the same time caused the muscles to enlarge and the frame to spread, while the very fat pigs became inactive, and like indolent bipeds, they neither worked for their own benefit nor for that of others.

"For the purpose of increasing my manure heap, my pens are kept constantly supplied with peat or swamp mud, about three hundred loads of which are annually thrown into my styes. This, with the manure from my horse stable, which is daily thrown in, and the weeds and coarse herbage which are gathered from the farm, give me about 500 cart loads of manure in a year."

The method pursued by Mr Ingersoll, to whose experience and success in rearing and fattening swine, we have heretofore alluded, will be best un-

derstood, from his correspondence with the editor of the American Farmer; from which paper we extract the following remarks.

“I am fully satisfied, from repeated trials, that a fine race of animals cannot be kept up by breeding *in and in*; and I have, both in my sheep and swine, two distinct families, which are crossed with each other. And, except to supply the number of each kind I want to breed from, the individuals of the same family are never allowed to come together. By attention and strict adherence to this plan of crossing, where both kinds are good, I have a fine healthy stock. The animals are improved, both in size and symmetry, and their disposition to get very fat, at an early age, has been increased. At twelve months old, the pigs you saw in my various pens, averaged 280 pounds; and many of them exceeded 300 pounds each. This weight, as they were fed almost entirely upon vegetables, was very satisfactory. A larger race has been often recommended to me by my neighbors. But a large race would not only require more food, but it must also be of much richer, and of more expensive quality. Boiled cabbages, turnips, and other vegetables, whose acreable produce is large, and which constitute the principal sustenance of my own breed, would make but poor returns when given to a larger framed animal.

“My establishment consists of twelve breeding sows and two boars, that are kept as long as they bring fine litters of pigs; failing in this, they are fatted, and their places supplied by others of one year old, before they are put to the male. The sows are put with the boars the 1st of April, and the 1st of October, and farrow twice a year. Their inside pens are eight feet by five, and their outside pens are three

by four feet. About the time they are expected to bring forth, the styes are littered with straw cut into chaff, very fine, that the little pigs may be dry and warm, without being entangled with long straw, and thus destroyed. The litters are always regulated so as to leave not more than eight pigs to any one sow, either by changing their mothers, when necessary, soon after their birth, or by removing supernumeraries. I have always found a family of eight pigs at a month old, worth more than one of twelve; their growth being so much greater. From each outside pen the pigs have access through a small hole, to a common yard, which is always kept well littered; in which they play; and where dry corn is placed in shallow troughs to induce them to eat as early as possible. Each party knows their mother, and they find their respective pens without difficulty. These pigs are *always* weaned the 1st of October, at six or eight weeks old, that the sows may be again in the way of their duty, and my system progressing. From these pigs I select seventy-two, and dispose of the rest. They are put into twelve pens, containing six each, and are fed with the best food my swill trough affords, six times per day, for the first month, and three times per day afterwards. The inside pens are six feet square, and the outside four-feet by six, both planked, with a quick descent for the dirt, &c., to be carried off. Much, *indeed everything*, depends upon their sleeping dry and warm, and being well littered, and kept perfectly clean. In these pens they remain six months, or until October and April, when they are all transferred to the fattening pens, and their places supplied by the newly weaned pigs. The fattening pens are planked—there is a cellar under them, and each pig is allowed an area of abou-

twelve square feet to live in ; for these there are no outside pens. The fattening pens are cleaned out every morning, and fresh litter given. For three months the pigs in them are fed from the swill trough as store pigs ; at the end of which time, say January and July, their fattening commences, which consists in adding, for each of them, three quarts of cracked corn to their daily allowance of vegetables, for three months, when they are killed as near the first of October and the first of April as may be. Thus you will observe the 1st of October and the 1st of April are busy days in my piggery, and the little pigs are then weaned, the sows again put to the boars, the fat hogs sold off, the store pigs removed to the fattening pens, and my system completed.

To feed this stock, consisting of

72 pigs from one to six months old, and

72 pigs from six to twelve months old, and

12 old sows, and

2 boars ; in all

158 mouths—we boil a kettle of vegetables, containing six bushels, to which is added one bushel of cracked corn three times a day, and after putting this mass into the swill trough and mixing it intimately, we add as much water as will make 112 gallons, or for each bushel of vegetables and corn, sixteen gallons. This swill is then distributed *sweet* and *warm* to the stock, morning, noon, and night, with great regularity, in the following proportions, viz :

“In October, November and December—to each of 72 pigs, from one to three months old, one gallon ; and to each of 72 pigs from six to nine months old, three gallons.

In July, February and March—to each of 72 pigs, from three to six months old, two gallons ; and to each of 72 pigs from nine to twelve months old, 2 gallons, with 3 quarts of corn.

In April, May and June—to each of 72 pigs, from six to nine months old, 3 gallons ; and to each of 72 pigs, from one to three months old, one gallon.

In July, August and September—to each of 72 pigs, from nine to twelve months old, 2 gallons ; and to each of 72 pigs, from three to six months old, 3 gallons with 3 quarts of corn.

8 galls.

8 galls.

And these eight gallons, divided by their terms, or four, show that on an average, throughout the year, two gallons are required daily per head for the 144 pigs ; or equal to 288 gallons ; and to our twelve breeding sows, and two boars, we give per day, three gallons each, or equal to 42 gallons, making, altogether, an aggregate of 330 gallons ; thus quite consuming our three messes of 112 gallons each. By the different ages of the pigs, as above combined, we have a constant and daily call for the same quantity of swill throughout the year, so that our business proceeds with perfect regularity.

“The following is a summary view of the total quantity of each kind of food used in my piggery per annum, and the months in which they are used ; beginning with the 1st of July, which is about the time I begin to depend upon summer vegetables, viz :

Bushels.

<i>July and August.</i> —Mangel Wurtzel, roots,	
and tops being the thinnings from two	
squares, each containing 32 rods,	800
Summer squashes,	200

	Bushels.
Early cabbages,	100
<i>September, October and November.</i> —Winter squashes or pumpkins,	700
Large drum head cabbages,	800
Trimmings of mangel wurtzel turnips, &c. &c.	150
<i>December, January, February, March, April.</i>	
—Mangel Wurtzel,* (roots,)	200
Carrots,	900
Ruta Baga,	200
Cabbages,	1500
<i>May.</i> —Parsnips which are left in the ground during the winter, and allowed to grow in the spring, until their tops are from 4 to 6 inches high, when they are daily dug as wanted, and boiled,	500
<i>June.</i> —Potatoes,	250
Early lettuce, peas, chopped up vines and pods when the peas are full grown, though still green,	250
	<hr/>
Bushels,	6550

“ We always mix the vegetables by boiling some of either kind in each kettle.

“ As it respects steaming, instead of boiling vegetables, the only expense saved is fuel, for the same labor is necessary in filling and discharging them. Our laboring people require to have their work simplified as much as possible, and their judgment not often called into exercise. Were I to tell my man to steam 18 bushels of vegetables, and to give one-third of them three times a day to the stock, the

*Cabbage and Mangel Wurtzel used first.

consequence would be, that a much greater quantity would be given at one time than another, and though the whole would be consumed in the course of the day, still the inequality of feeding would be hurtful. Besides in winter, particularly, the swill must be very warm, which could not be so at night with vegetables steamed in the morning. Upon the whole, therefore, I prefer to say to him, 'fill the kettle with vegetables, and after they are boiled away sufficiently to make room, put in one bushel of cracked corn and oats, and give the whole for breakfast,' thus making out the exact line of duty, and leaving nothing to his discretion.

"I give the swill warm in summer, and almost hot in winter, and always sweet and fresh. In conversation with Dr Derby, he argued upon the propriety of feeding with sour food, and that cold. I have formerly tried it and satisfied myself it was wrong. Pigs may be habituated to eat it; but place this cold stuff in a trough, and a good smoking hot breakfast of mine in another beside it, and I will venture to say, they will soon show a preference."

Says D. Hilliard, Esq. of Skaneateles, N. Y., in a letter to the Hon. H. L. Ellsworth,—“We have invariably mixed other feed with fresh water. When feeding, we feed three times a day, changing from barley meal, to corn meal, peas, or provender, as we chance to have the same on hand; paying strict attention to give a dose of sulphur once a week at least, and salt as often. Salt should never be omitted, as it is of great importance, and has as much influence on the hog-kind, as on cattle, in producing health and growth. Twice a week, we also feed our hogs with *charcoal*; this is far better than rotten

wood, as it has great nutritive qualities, and keeps the bowels in a sound and healthy state."

Benjamin R. Fowler, Esq., an intelligent agriculturist of Branford, Connecticut, in a letter addressed as above, remarks:—"From actual experience I have come to the conclusion, and practised upon it for the last twelve or fourteen years; of having as many pigs, that come, say in March, as I have cows for the summer. I feed these pigs on milk or whey, mixed with provender, ground from corn, rye, oats, barley, or buckwheat; and prepare it as a pudding. In this way the pigs will eat it best; if they become cloyed with one kind of grain, I try another, and often mix different kinds together. They will often feed best on boiled potatoes, mixed with provender and milk. I feed until about the 1st of October, whatever they will eat the best, and give them as much as they will eat, together with occasional supplies of weeds and grass; sometimes keeping them in close pens, or where they cannot run at large.

"After the first of October, I take all this kind of feed from them, and feed with as much corn and water as they will eat, until say the middle of December, or first of January. If I think they are fat enough, I butcher by the middle of December; if not, I keep them a few days longer. I shell all my corn and soak it for twelve hours before feeding, in order to prevent the effect of hard corn on their teeth. I am careful, that they have clean water and corn, twice a day; and if at any time they appear dull and do not have good appetites, I give two or three ounces of sulphur to each pig while feeding.

"If you feed the corn on the cob, and do not soak it, their teeth will become sore; the animals will

grow uneasy ; will rattle in the ground, and will not fatten. From the time I begin to feed with corn and water, until I butcher, each hog will consume about ten bushels of corn."

The Rev. Mr Watson, of Cobleskill, in a communication in the *Cultivator*,* remarks,—“I purchased two pigs, December 23d, 1834, for \$6 50 ; they then weighed 316 pounds ; they had been dropped sometime in the preceding April. They were immediately put in a warm pen, and fed on rye, or corn meal, six quarts a day, in three feeds, with regularity and precision, until October following ; then they were fed nine quarts per day about one month ; then with twelve, until the 17th of December, 1835, when they were butchered ; at which time they weighed 1,138 pounds.

“They were fed on grain 349 days ; they drank the refuse milk of two cows, and had a few weeds from the garden. If we allow one third offal in dressing, they gained in live weight, a fraction under two and a half pounds per day, and cost about ten cents per day. They ate 55 bushels of rye and corn ; the grain was ground fine, and the toll taken out ; in cold weather it was scalded and fed warm, in warm weather, fed dry, and milk poured on it in the trough. None was ever made into swill and fermented. The grain cost 5 shillings per bushel, equal to \$34 37 1-2 ; value of pork at \$7 per hundred, equal to \$79 66 ; deducting first cost and grain it leaves a balance in favor of the producer, of \$39 28 1-2 ; tolerably fair pay on two pigs.”

“On the 10th of October,” says Mr T. Mitford,†

* *Cultivator*, vol. 2. p. 182.

† *Ibid*, vol. 3. p. 50.

"I shut up to fatten for E. Holbrook, Esq., 20 swine, viz: 10 about fifteen months old, two China hogs, a boar and sow, and eight shoats pigged the beginning of June last. The whole when shut up, was only a middling stock. They were divided into three lots, and closely confined; we proceeded to fatten them by steaming four bushels of small potatoes, 12 bushels of apple pomace, four bushels of pumpkins, and 1 cwt. of Buckwheat cornel, adding a little salt. The whole was incorporated well together, while hot from the steamer, with a wooden pounder, and fermentation was allowed to take place, before it was fed away. They were also supplied with plenty of charcoal and pure water.

"On feeding the first steamer of the compound, I perceived more than ordinary moisture on their litter, and attributed the cause to the pumpkins acting as a diuretic, stimulating the kidneys and increasing the evacuation of urine. In the next steamer, I substituted four bushels of ruta бага for the pumpkins, which had the desired effect. This experiment has convinced me that this mixture affords a greater mass of nutritive material prepared for the action of the stomach, and produces pork more rapidly than any combination of food I ever made use of.

"Using up all our pomace, and having a greater quantity of soft corn than usual, we commenced giving it to the hogs, but instead of improving in their condition, they fell off, and we were under the necessity of procuring two loads of apple pomace from our neighbors, and commenced steaming and feeding again with the same good effect, until eight days before they were killed; during which latter period they were fed with sound corn, and slaugh-

tered on the 1st of December. The expense of fattening and the product of pork is as follows.—

32 bushels of small potatoes, a 2s.	\$8 00
32 “ ruta бага, including pumpkins, a 2s.	8 00
10 bushels soft corn, a 4s.	5 00
10 cwt. buckwheat, a \$1.	10 00
20 bushels sound corn, a 6s. 6d.	16 25
	<hr/>
	\$47 25

By 40 cwt. of pork, a \$7 50 per cwt.	\$360 00
Deduct Expense,	47 25
	<hr/>

Balance, \$312 75

In a recent communication, (November, 8, 1839,) to the Hon. H. L. Ellsworth, Mr Phinney remarks as follows:

“ When the difference as to the cost of fattening the different kinds of swine is considered, as well as the saving that may be made by a proper attention to the preparation of their food, it is certainly a matter of astonishment that farmers have paid so little attention to the subject. No animal is so unprofitable to the farmer as the common coarse framed, long legged, slab sided hog;—he is a moth to the owner, devouring his substance and yielding him in return little else than bones and bristles; while on the other hand some of the improved kinds are by far the most profitable stock he can raise, giving him from fifty to one hundred per cent. advance upon every dollar expended in their keeping. The subject of the immense saving that may be made in the whole nation, by cooking their food, and the introduction of an improved breed of swine, I had never considered on the extended scale in which you view

the subject, but from the experiments I have made in a small way, I fully believe in the correctness of your positions. The correctness of your estimate of the amount that may be saved by cooking the food, I have tested and proved to my own satisfaction by repeated experiment, and I have no doubt that by substituting some of the improved breeds, taking into consideration the improved quality, as well as the increased quantity of the pork, that a saving of thirty-three per cent. may be made.

“After killing off my hogs in March last, I wanted a couple of hogs to put upon my manure, thrown from the horse stable, to prevent waste by heating. I accordingly purchased from a drove of Vermont hogs, two of the common coarse breed. They were indeed of the order of “lean kine.” I believed that notwithstanding their appearance being so much against them, I could with a little extra keeping make them fat—but in this I have been disappointed. For the first four or five months, in addition to what they got from the manure heap, I gave them each two quarts of Indian meal, well cooked, per day, besides as much green clover and other green herbage as they would eat. For the last three months they have had four quarts of meal each, per day, mixed with an equal quantity of boiled potatoes or pumpkins, still they are not fat. In an adjoining sty I put two of my favorite cross of the Berkshire with the Mackey. To these, for the first four or five months, I gave one quart each per day of the same kind of food, with the same allowance of green food, and for the last three months they have had two quarts each per day. The increase in the weight of the occupants of the two styes is about the same, but the difference is, that the increase of the former consists principally of

of bone, and the latter of flesh. Separate the flesh from the bones of each and I have no doubt it would be found that the Berkshire and Mackey pigs would give three per cent. more clear pork than the Vermonters. And this it will be recollected is upon just half the expense of food.

“The slop of the kitchen in some families is a very important item in the food of swine. On an adjoining farm, of which I have the care, I have had seventeen swine, kept in fine order (from eight weeks to eight months old) entirely upon the *slop* of the kitchen, without a pound of meal or grain, but the slop consisted of the common refuse of a kitchen added to the skimmed and butter milk of ten cows.

“My hogs, which are kept in pens the whole time, at the age of eighteen months, to be well fattened, will each require an average of thirtythree and two-thirds bushels of meal, cooked—say one quart each per day for the first six months, two quarts for the second six months, and three quarts for the third six months—average weight four hundred pounds. This is upon the idea that they have no other food than the meal. Those pigs killed at from ten or twelve months old will require on an average twenty bushels each, averaging three hundred pounds. Where pigs could find a plenty of good pasture, and the manure would be of little value, a great saving in this amount may be made by turning them to grass for a part of the season.

“Last June, for the first time, I put a dozen of my breeding sows into a lot of ten acres, having about two acres in clover, the residue covered with trees and bushes. The only food they had except the grass, was one pound each per day of badly damaged rice, which cost one half cent per pound.

This was soaked for fortyeight hours in a pail full of water to a pound of rice, and now, on putting them into the pens, I find them quite too fat for breeding sows."

DISEASES OF SWINE. An intimate knowledge of the various diseases to which swine are subjected and the proper modes of treatment for their prevention or removal, are points of great importance to the breeder.

While it has been the opinion of many, that the disorders of swine are beyond the reach of remedial measures, and that "when a hog has once ceased eating" the *knife* should be resorted to,—others have gone to the opposite extreme and are ready with "infallible cures" or "certain remedies" for all diseases. It is from the extremely low valuation generally placed upon the hog, and consequent inattention to his diseases, that we owe the great confusion of statements on this subject; and it certainly must be admitted, that, "while doctors disagree" and succeeding numbers of agricultural papers condemn, what former pages have proposed, the situation of the humane breeder is one of great embarrassment. Desirous of securing some remedy, he yet hesitates, and his decision, if at length he makes one, is too often unavailing. When farmers are once convinced, of what is undoubtedly true, that the profits to be derived from hogs when judiciously managed *exceed* those of any other animal, we shall find that the present modes of treatment, and the prevailing ignorance, will yield to a perfect knowledge of the diseases of these animals.

There is a homely, but a very significant adage, "that an ounce of prevention is worth a pound of cure," and its application to the disorders of swine is

especially remarkable. *Prevention of disease*, is the grand point which should command the consideration of the breeder; and one which close attention will enable him, in general, to attain. The condition of swine, while growing, and especially while fattening, should be investigated daily. When these animals are enclosed in stall pens, or small enclosures, such investigations are absolutely necessary and will always be faithfully pursued by those who desire to keep their stock in a healthy and thriving state.

We have heretofore spoken of the necessity of *cleanliness*, and as our readers have perused the suggestion given, it will hardly be necessary to remark further on that subject. If any doubt the great benefit derived for keeping the surface of the body constantly *clean* and the *pores open*, let them test the matter by experiment; it is easily done, and decide from the results of their own trial. It would indeed be well, if in the treatment of animals we referred oftener to our own system, and derived our principles from that most important of all laboratories, the *human stomach*. References of this kind would seldom mislead us, and we should be astonished to observe how far the modes of treatment which nature seemed to indicate and experience sanctions as regards ourselves, are applicable to the animals we rear and fatten for profit or convenience.

Salt, should be given to swine frequently and freely, and is easily administered, if intermingled with their food three or four times weekly. An examination of the modes pursued by various distinguished breeders, which we have given in the former part of this chapter, and in other portions of this volume, will show their constant use of this article,

while the earnestness with which they recommend it is remarkable. Dry rotten wood is another article found to be serviceable to hogs, and small quantities of it should be kept continually in their pens, or in places to which they have daily access—while, to prevent the evils of over-feeding, and they are numerous, sulphur should be resorted to in doses of one or two teaspoonfuls, once or twice a week. For *surfeits*, sulphur is an admirable remedy, and in such cases should be given, in ounce doses two or three times daily, and continue for several days.

Charcoal is one of the best articles that can be given to hogs, to correct acidity of the stomach and preserve a healthy tone and action of the bowels. It is an excellent remedy in diseased lungs, a complaint by no means unfrequent with these animals. An intelligent writer in the *Franklin Farmer*, while speaking of the value of charcoal, in affections of this kind remarks as follows. "As the rearing and fattening of hogs has become a business of great importance to the West, and especially to our corn growing States; and as new and terrible diseases have made their appearance within the last few years, among that class of our domestic animals, I, as a common sufferer with my brother farmers, have been trying to ascertain the cause of, and remedy for, the one which I have suffered the most by, and which I shall call your attention more particularly to.

"It is admitted by pathologists, that diseases may, and do change their type in the same latitude, and become more and more malignant as the population becomes more dense, and the country becomes colder; thus our own intermittent has degenerated into the more deadly typhus fever; thus, that which we

once called quinsy or swelling of the throat in swine, has now assumed a more malignant type, and requires a different treatment; the cause is the same, but the effect is not always instantaneous or accompanied by the same symptoms or results. I think it may safely be assumed that most of diseases that hogs are liable to, are produced by sudden transitions from heat to cold; especially as they do not, to the same extent with other animals, perspire through the pores of the skin over the whole surface of the body, but through small orifices in the legs and throat. These orifices are continually liable to obstructions, and particularly in the winter season, when great numbers of these animals sleep together, and where perspiration for a short time is succeeded by an opposite state, in the frequent changes of position; thus clogging the medium of perspiration and laying the foundation of disease and death.

“This exposure, as we have stated, formerly produced enlargement of the glands of the animal’s neck, which often ended in inflammation and death. Now, the same cause produces very different effects, and although it is still strangulation, yet the inflammation falls with its whole weight upon the lungs; and if both tubes of that organ are affected death instantly ensues: if only one, the animal may live a long time, but never recover unless the remedy that I shall presently suggest, or one equally potent, be applied. The symptoms, when the attack is violent, are, a seeming sense of suffocation, great indisposition to move, a deep crimson color, approaching to purple all over the body; and if forced to move only a few paces, the animal will pant as if worried by dogs in hot weather. If the attack is less violent, it will take more exercise with seemingly

less pain, will throb in the flanks in much the same way that a horse will when exhausted by fatigue and hard usage; is generally inattentive to its company, is inclined to eat earth rather than its accustomed food; such generally live a long time, but seldom recover.

“I now proceed to point out, how to *prevent* the disease, and to cure it if taken in time. Do not suffer your hogs to herd together in large lots in cold weather; never suffer them to sleep in hollow trees; if you have sheds for them to sleep under, let them be set so low that they cannot in great numbers heap together. In dry, hard, freezing weather, let them have some succulent food such as apples, potatoes, or turnips, but especially let them have *plenty of salt and charcoal*; this last is a cure for the disease if administered before they entirely refuse to eat. It is known to almost every one, that charcoal is a powerful antiseptic and absorbent, and that hogs search for and eat it with eagerness, especially in banks of leached ashes; and so they will unassociated with ashes, if at first you break it up into small lumps, and pour a little salt and water over it.”

In addition to the suggestions made by the above writer, we add, experiment has clearly shown that when confined in separate stalls, or in larger but well protected apartments, swine *are seldom* affected by swellings of the throat, or the more aggravated disease referred to; and that, independent of its power in curing, charcoal is one of the best articles for preventing the various disorders of swine. It is not only nutritious—this is clearly shown from the statements of Mr Cunningham and others in the former part of this chapter,—but it is a powerful corrective of the acidity produced by feeding too much grain at once,

or for too long periods. It is also found that charcoal, when frequently administered, effectually destroys the propensity of hogs to root, and causes them to remain quiet in their pens or yards; thus securing that rest which is essential to expeditious fattening.

We have before spoken of the necessity of keeping the issues in the legs of swine, *constantly open*. These orifices, as is suggested by the writer last quoted, are the natural channels for the passage of a great part of the perspiration and waste fluids of the system, and if they are obstructed, the health of the animal must soon deteriorate.

In all well conducted piggeries, there should be a sufficient number of small boxes filled with sulphur, salt and charcoal. If the former of these articles is purchased by the barrel, it can be obtained for one fourth, or less, of the retail price of the stores. In addition to these, a small handful of wood ashes may be occasionally mixed with the food of each animal; and the meal of the cob, if ground with corn, will be found, from the alkaline properties it possesses, a sufficient corrective of acidity.

Simple remedies, like those proposed, are the ones best adapted to the disorders of hogs, and when faithfully given in connexion with judicious treatment, will in general prove successful. Mineral substances, though used by many, should be avoided in all cases where such a course is practicable; and, indeed, with the exception of calomel, in extraordinary cases, there are few of these medicines that can be recommended. The diseases of swine are not sufficiently understood to warrant the free use of these powerful articles, and desperate cases alone justify their employment, as a last measure.

"Four or or five and twenty years ago," says Mow-

bray, the late Mr Tattersall requested of me to choose him a store pig to put up for fattening. I applied to Mr Wynt, the then salesman, and we chose one at Finchley, out of a fine drove of Herefords, not then out of fashion. After the hog had been at Mr Tattersall's two or three days, I received a letter from him to tell me it was taken very bad, in fact, dying. On inspection, I found the animal sleepy and torpid, refusing food, but occasionally throwing up the contents of its stomach which consisted of half digested meal. I immediately perceived the cause of the patient's malady. The feeder, determined to lose no time, had been assiduously filling up the trough with food, which the hog, empty after a long journey, voraciously devoured, until its stomach was filled, and its digestive faculty totally overpowered. My prescription was abstinence from corn, a moderate quantity of sweet grains, thin wash, sulphur with it, and in a few hours the hog was perfectly recovered. In the sequel, the feeder held up his hand with astonishment, at the possibility of a hog being gorged with food !"

"I have been favored," continues the same writer, "by a very old friend, with the following successful and instructive case, which I give from the MS. received : 'In the autumn of 1828, one of my sows, four years old, a good mother, remarkably good tempered, a cross between the Oxford and China breeds, with eleven fine pigs by her side which had been farrowed three weeks, was suddenly seized with fever and inflammation. In twelve hours she became unable to stand, was very restless and apparently in great agony, no evacuation having taken place during two days. In consequence I called in the aid of a noted cow-leech of the vicinity, who with much gravity promised he would do what he

could for her, but that all would be of no use. The operations of bleeding anointing and medicine were carried on for three day , at a charge of thirtyfive shillings, when the sage doctor dismissed the case with the consolation to me—that he could do no more for the patient, and that it was impossible she could live.

“I then took her in hand myself, bled her and gave her a strong dose of salts and jalap, which I succeeded in delivering, her paws being held open by a rope attached to each. In about an hour thereafter she had three pints of warm gruel. In less than three hours I had the satisfaction of observing symptoms of great tranquillity, and improvement in my patient ; and after leaving her at night on a clean and comfortable bed, I was gratified by finding her upon her legs next morning, in a fair progress to recovery. I then repeated the same dose, somewhat reduced in strength, and still keeping her on warm gruel two days, my satisfaction was complete on finding her quite restored to her former health, saving a little inconvenience from the obstruction of her milk. Of the pigs previously removed nine did well, and the sow became freed from all the relics of her disease in ten or twelve days. I did not choose to risk another farrow with her, therefore put her to the boar in October, and fed her for the knife. She was killed at Christmas, and made excellent bacon. Thus I saved a fine hog by calling in Doctor Common Sense, to atone for the insufficiency of the most skilful *leech* then and there going ; and if my brethren pig breeders and pig feeders would follow my example, in most cases, I humbly opine it would be to the benefit both of their pockets and their pigs.”*

* Mowbray on Poultry, &c., p. 192.

Says Mr Lawrence, an eminent English agriculturist, "When the hog lies upon his belly and contracted, it indicates a sense of cold, or some indisposition. If inaptitude to thrive be owing to a foul, scurvy and obstructed hide, the best remedy is to extend the hog on a form, and wetting him with a ley, made of half a peck of wood ashes boiled in urine or salt water (soap suds will answer), to curry or scrub him clean; then to wash in clear warm water, and dry him with wisps (of straw), strewing him over with ashes and putting him into a deep straw bed.

SWELLING OF THE THROAT, OR QUINSY.—This is an affection very common among swine, and arises, like the "disorder of the lungs" which we mentioned a few pages back, from exposure, and too sudden transitions from heat to cold. It is also supposed to arise from, or at least to be augmented by, protracted indigestion, the result of over-feeding or hard grain. One of the best modes of preventing the disease, is to provide always for the animal, a *covered* pen or enclosure, where it is protected from inclement weather during sleep, and the frequent use of charcoal and sulphur, as previously recommended. Bird Smith, Esq., of Kentucky, has adopted the following mode of treatment, and with great success in the incipient stages of the disorder. He removes his hogs as soon as he perceives any symptoms of the disease, from the fields to convenient pens, and feeds them with a liberal allowance of corn well glazed with tar, and as many ashes put on as will adhere to the grain. He also observes that hogs enclosed in styes, rarely if ever labor under this affection. Others recommend strongly the following prescription:—Mix together half a pint of molasses and a table spoonful of hog's-lard, add one inch of the ordinary brimstone rolls, melt the whole, and drench the hog with it when cold.

THE STAGGERS.—This is a disease to which swine are sometimes subject. Hogs affected suddenly with this disorder, turn around rapidly, and if not assisted will soon die. On opening the mouth a bare knob, in the roof of it will be discovered (this, however, is not always visible), which, if found, should be cut and allowed to bleed. Some writers recommend the powder of loam and salt, rubbed into the wound thus made, and the administration of a little urine to the hog.

A writer in the *New England Farmer*, remarks that he “lost two swine from ignorance as to the cure of this disease; but by cutting off the tails and ears of the animals, as the easiest way of bleeding them, giving them strong doses of castor oil, and turning them out of the sty into the pasture,” he succeeded in saving them. Sometimes they relapsed, but were restored again by being turned out. But they did not soon come to their appetite, and the disease materially, and for a long time, retarded their growth.

MEASLES.—This disorder generally affects the throat, which on examination is found filled with small pustules, and a similar appearance is sometimes exhibited on the outside of the neck. Under the influence of this disease, the animal appears languid; has red eyes, and loses flesh with great rapidity. The symptoms, however, are often obscure, and the disorder is one that should be suspected, whenever the animal for a long period, appears to be “off his feed” and in a dilatory condition. The frequent use of sulphur, in small doses will generally prevent the measles, and do much towards their cure. Charcoal, perhaps, is a better remedy. Some writers recommend small quantities of levigated crude

antimony intermixed with the food of the animal. This disease is one which does not affect animals confined in pens, and properly fed, to the same extent with those that run at large.

GARGET—Is an inflammation of the udder, and arises from its over distention with coagulated milk. It generally happens, when sows are too fat at the season of littering, and should be remedied as soon as possible, as the pigs will not suck during its continuance. In slight cases, bathing the udder with camphorated spirits of wine is recommended. The milk also, should, where practicable, be squeezed out by the hand, and the food of the sow should be cooling and slightly laxative in its nature. It is not, however, a disease of very frequent occurrence, especially in its severe forms.

MANGE.—This is a cutaneous affection, and arises from a want of *cleanliness*. Prevention, therefore is easy, and indeed its existence argues great inattention on the part of the owner. This disease is at first recognized by the appearance of small red pustules over the surface of the skin, which as the disorder continues, are rubbed frequently and violently by the animal, until scabs are produced. The use of sulphur, in doses of half an ounce twice a day for three or four days will generally be found sufficient to remove the disorder.

Dr Norford, who has turned his attention somewhat to this affection, remarks that, the animal should be well washed with strong soap suds; and then be anointed with an ointment formed of an ounce of sulphur, two drachms of fresh pulverized hellebore, three ounces of hog's lard, and half an ounce of the water of Kali, or alkaline solution. This is sufficient for one time, for a hog weighing an hundred. If properly applied, no repetition will be needed.

Where the mange is accompanied by a slight cough, the same writer recommends small doses of antimony ; from an ounce to an ounce and a half,—according to the size of the animal, finely pulverised and mixed with his food for ten days or a fortnight. But when from long neglect, the neck, ears, and other parts have been ulcerated, they should be anointed with equal parts of tar and mutton suet, melted together, till the cure is completed.

THE MURRAIN, or leprosy is known by the shortness of the breath, and its great heat, hanging down of the head, and copious secretions from the eyes. It is attributed to very warm weather, when the blood becomes inflamed. The following is the remedy proposed. Boil a handful of nettles in a gallon of small beer ; add a half pound of sulphur, a quarter of a pound of flour of anniseeds, pulverised, three ounces of liquorice and a quarter of a pound of elecampane ; and give the mixture in milk, at six doses.

DISEASE OF THE LOINS.—This disorder is one of rather frequent occurrence in the Western states, and is generally termed the kidney worm. It is easily recognised by the extreme weakness, and rapid emaciation of the animal, and an inability to walk on all fours, compelling the hog to crawl forward, dragging his hinder parts slowly after him. It is now generally thought to arise from a collection of worms in the intestines. It is hardly necessary to remark that hogs can never fatten during the existence of this disease, and in general, if not checked at once, death is the inevitable result.

Some cases are reported where this disease has been cured by the administration of large doses of arsenic ; but this powerful mineral was resorted to

as a last chance, and besides generally mingled with other remedies, so that its peculiar effect cannot be stated with precision. Its use, however, cannot be recommended.

Probably the best remedy, is to drench the hog with tolerably strong portions of ley from wood ashes, mixed with tar. If this is not successful, from twenty to thirty grains of calomel may be resorted to, and should be given mixed with half a pound of meal dough.

Among other diseases, hogs are subject to dry cough, and rapid wasting of the flesh, and fever, or rising of the lights. For the removal of the former, a dry, warm sty should be provided, and a regular supply of food calculated to keep the animals cool, and allay the irritation of the lungs. For the second, the cause of which is over-feeding, small doses of sulphur and oil may be given.

The opposite conditions of diarrhœa and constipation are met with frequently in large herds of swine. The former arises in general from a meagre and laxative diet, and is cured by a change to more substantial food, with the occasional admixture of tonic drinks; with the English, farmers' beer, and liquids of that nature are given, in connexion with generous diet, for the removal of a lax state of the bowels. In constipation, an opposite course should be pursued, and the various roots or mucilaginous seeds may be given with advantage.

Where hogs are suffered to run at large, they are sometimes poisoned by deleterious articles of food: in this condition, they exhibit sudden transitions from extreme languor and stupidity to convulsions. Their eyes are blood shot; their extremities cold, and their usual grunt exchanged for one deeper and more

frequently repeated. In cases of this nature, the animal should be forced to swallow as many pints of milk as possible ; and two or three hours afterwards still more, mixed with a decoction of mucilaginous substances : such as flax seed, olive oil, &c. They should also be bled immediately, and several times, if the symptoms continue.

A French writer,* while considering the diseases of swine, holds the following language in regard to the murrain or leprosy. “ Want of water, corrupted air, insufficient nourishment, in short, the negligence of the owner, is the great cause of this malady which so speedily and entirely deteriorates the flesh of the hog ;—at first rendering it flabby, difficult to preserve, and ill adapted to salting, and eventually discolored and impure to such an extent that it cannot be eaten without disgust.

“ This disease is a cachexy, to which a verminous disposition is superadded. During its continuance, the animal is stupid, his ears and tail hang down, his eye has a troubled anxious appearance, his snout is warm, the beating of his heart lessened, and his bristles constantly erected. To these symptoms, which indeed attend nearly all the maladies of swine, are added, great insensibility, thickening of the skin, constant weakness, so that the animal can remain standing but a few moments, and above all, the presence of numerous small whitish tumors, on the sides and lower portions of the tongue, near the throat.

“ It is the last symptom which occasions such frequent examination of the tongues of hogs in our markets, by the knowing ones, (*langueyeurs*,) and

*Vide Encyclopedie des Sciences et Arts.—Manuel du Charcutier, p. 90-91.

which investigations generally detect the disease. In the language of these persons, hogs thus affected, are termed "*grained*" from the resemblance between grain and these small tumors with which the flesh is strewed. If his animals, when thus disordered, can be sold at even low prices the owner should be contented, for the disease is generally one that makes a fearful progress.

"When the sides and base of the tongue are covered with a multitude of these tumors, it denotes great internal derangement, and in its last stages the disease produces successively, paralysis of the trunk, a bloody taint of the skin, falling of the bristles, putrid evacuations, and nauseous exhalations from the body; the cellular tissue is raised in different places, the abdomen is covered with tumors, the extremities become swollen, and death terminates the sufferings of the poor animal.

"The remedies for leprosy are few, and therefore great care should be taken to prevent it. We cannot too strongly enforce the doctrine that *cleanliness* is the great resort. Strict attention should be paid to the condition of the animal, and the litter should be frequently changed. Roots should form part of the food, and no rapid changes be made from a high to a low diet, or the contrary. Their stomachs should be strengthened with sustenance, administered at proper seasons. Treat them thus, and this disease need be no longer feared. The hog will be sound and healthy, with firm flesh; and, what should not be disregarded, will live contented. The unnecessary suffering of domestic animals is a reproach to their master, and should occasion his remorse.

"It is not yet settled whether the leprosy of swine is hereditary; it is only known that in young hogs

there exists a disposition to this disease. It is therefore recommended to examine in all cases boars and sows, intended to be kept for the reproduction of their species, and thus discover whether any of the symptoms of this disease are present. Besides the indications of the tongue, attention should be paid to the state of the skin, its softness, and other marks of perfect health."

The foregoing suggestions on the diseases of swine are, it is true, imperfect ; but as we remarked at the commencement, little is known upon these subjects. The best that we can do, is to impress on the mind of the farmer, the necessity of constant attention to his stock. As a Roman rhetorician, when asked to describe the three important qualifications of an orator, replied " action " thrice repeated, so we, if called upon for the three great resources of the farmer, in the diseases of his animals, would answer *prevention*, PREVENTION, PREVENTION.

" Where a number of swine are bred," says Henderson,* " it will frequently happen that some of the pigs will have what is called a ' rupture,' i. e. a hole broken in the rim of the belly, where part of the guts come out and lodges betwixt the rim of the belly and the skin, having an appearance similar to a swelling in the cod. The male pigs are more liable to this disorder than the females. I never found much difficulty in curing this disorder by the following means.

Geld the pig affected and cause it to be held up with its head downward ; flay back the skin from the swollen place, and, from the situation in which the pig is held, the guts will naturally return to their

*Henderson's Treatise on Swine, p. 60.

proper places. Sew up the hole with a needle, which must have a square point, and a bend in it, as the disease often happens between the hinder legs, where a straight needle cannot be used. After this, replace the skin which was flayed back, and sew it up when the operation is finished. The pig should not have much food for a few days after the operation, until the wound begins to heal."

We now pass to consideration of other matters—the slaughtering of hogs, and the preparation of their flesh for market. For the purpose of affording our readers information, at once practical and interesting on these subjects, we annex the following accounts of the pork business at Cincinnati, where it is far more extensively followed than in any other portion of our union.

The first communication which we place before our readers, is taken from the correspondence of Allison Owen, Esq., a highly respectable merchant of Cincinnati, with the Editors of the Baltimore Patriot and other eastern papers. These communications were written in 1835, and the information furnished is entitled to the greatest credit. The following are some of the author's remarks.

"Cincinnati is the greatest pork market in the known world. The number of hogs slaughtered annually, and the perfection and science to which the art of "hog-killing" has been brought, is indeed astonishing. The business of *butchering* is carried on distinct from that of *packing*, and by different persons. The most extensive establishment of the kind is the one on Deer Creek, owned and conducted by Mr John W. Coleman. At this place, last year, 100,864 hogs were slaughtered. There are four houses situated at different points on the ground oc-

cupied, which is a lot of eight acres—the ground is divided into pens, some 40 or 50 in number, where the hogs of each owner are put by themselves preparatory to the massacre. About 40 men are employed in each house, and each has his separate and allotted duty to perform, and receive on an average about \$1 25 per day. Each house has two scalding tubs, one at each end, so that the work of ‘death and destruction’ goes on *double* in each building. At each end of the house is a small pen, into which they crowd 40 or 50 hogs, or as many as can possibly be got in—then walks in on their backs, the dark and bloody executioner, holding in his hand a large sledge hammer, with which he ‘deals death’ to the unoffending victims—after which they are dragged inside the house, a knife passed into the throat, and after bleeding a few seconds, thrown into a kettle of hot water, from thence to a block, where the bristles are scraped off with iron scrapers, made expressly for the purpose—then strung up by their hind feet and dressed—thence removed to another room, where they remain ‘to cool’ until morning, and then taken on wagons to the packing houses. It is but a little over *one minute from the time the executioner enters the pen and knocks the hog down, till he is strung up and dressed.* The bleeding, scalding, scraping, stringing up, and inside dressing, is *all* accomplished in about *a minute.* This will be thought marvellous, but it is no more strange than true. I have frequently witnessed with astonishment the operation. At one of Mr Colman’s slaughter-houses, he has a man that opens, removes the offal, and completes the dressing of *three hogs in a minute*—to this man (who is a sort of king among the hog killers) he pays two dollars and fifty cents per day.

“They can slaughter at each of the houses, and have them completely dressed and strung up, (preparatory to removal in the morning to the packing houses,) *six hundred and fifty in a day*, which is altogether, at this one establishment, *twenty six hundred*—and this done from daylight in the morning till dark, say at this time, about *eleven hours*, allowing thirty minutes for dinner. Mr Coleman informed me, that he has already killed this fall between 50 and 60 thousand, and has been at work but three or four weeks ; the only pay he receives is the offal, consisting of rough fat, soap grease, and bristles ; this is generally worth, net 20 to 25 cents each hog. It is supposed he cleared at this business last season (and the season lasts but about three months) some 15 or 20,000 dollars. The whole number of hogs killed last year, in the city and vicinity, is ascertained to be a little rising *one hundred and twenty three thousand*. Deer Creek is a stream running into the Ohio river on the eastern suburb of the city ; about half a mile up this stream, these slaughter-houses of Mr Colman are situated, and during the whole ‘hog season,’ this stream, from the houses to the river, is running blood, and generally goes by the name of ‘bloody river.’ ”

The following communication of Mr H. R. Smith, of Cincinnati, for which we are indebted to the kindness of E. P. Cranch, Esq. of that city,—will exhibit the present condition of the pork business at the West. (Dec. 1839.)

“As the hogs are driven into the city, they are put into pens adjoining the slaughter houses, and immediately on a sale being effected, or the owner chooses to cut on his own account, (the weather being suitable) killing commences. They are driven

then into a small pen attached to the slaughter house, about twelve or fourteen at a time, a man goes in with his weapon, (a sort of iron hammer about three pounds in weight, with a handle from three to four feet long,) and by as many blows brings down all that are in this small pen, (one blow on the forehead of each animal is sufficient.) No noise is heard, except now and then a stifled groan of the poor creature as he falls. The hammer is then laid aside, and a large hook put into the mouth of the hog, and by two men he is dragged out into the apartment for scalding, &c. ; they are here stuck and the blood runs off by a small channel or gutter made in the brick floor for that purpose. A large low tub is close by, (ready to receive them) filled with water a few degrees from scalding, into which they are put and soured about for a few minutes until the hair can be removed with ease. (I presume it is well known that if the water be quite scalding, it will *set* the hair ; thereby acting on it directly contrary to the purpose for which it was intended.) A little boy the moment the hog is lifted from the tub to a bench on which he is cleaned, makes two or three grabs at the neck of the animal for the bristles, which are consigned to a barrel, which, when filled, is sent off to the cleaner or comber. The hog passes on the bench through several hands, till he is perfectly clean ; is then hung up for gutting and dressing. On this bench, sometimes, as many as six, eight, or even ten are being cleaned at the same time, passing rapidly from one to another till completed. When hung, the gutting and dressing is but the work of a few seconds, and he is immediately removed into an adjoining room, and left hanging to cool. They are usually left one night, and in the morning are firm and in good order for cutting.

“ At one slaughter house in this city, they can kill, clean, and dress 800 hogs in a day, with thirty hands ; 1000 have been got through, but it is very great exertion, and much over an average day's work. The former number, say 800, is a fair average for the 30 hands. Wages for these hands, about \$1 25 per day. Three four horse teams cost about \$16 per day, and wood, and other small expenses, say \$4, making an aggregate expense of less than \$60 per day, for labor and all expenditures ; supposing the number of each day's killing to be 800, the cost of each hog would be less than eight cents ; but as they have not always got this number ready for killing, the average cost per hog ought to be calculated at a little advance, and say about nine cents. This sum appears a very small one, when the trouble and frequent handling of a large hog is considered, but with good management it can easily be done. The gut fat is trimmed from the inwards in a small apartment petitioned off in the scalding and cleaning room, and as soon as a cartload of it is ready, it is sent off to the ‘renderer,’ who is generally a pork packer. All the apparatus necessary in an establishment of this kind is the ‘hammer,’ as before described, a couple of 40 gallon kettles for heating the water, a tub about 7 feet in diameter, and 20 inches deep, in which they put the hog to move the hair, a rough bench on which they clean it, about two feet high and twelve to fourteen long, and a common bench or table about four feet high at which they clean or separate the gut lard from the inwards.

“ The frame building in which the hog is hung to cool is very open, and has beams about six feet high every three or four feet apart, with large hooks about two or four inches long, on which the animal is

suspended. The quantity of fat from the intestines is, from some hogs, eight pounds, while from others only four or five; a fair average may be about six to six and a half pounds; worth from four to seven cents according to the price of pork and No. 1 lard; this year it may bring five or five and a half cents. Bristles in their rough state are worth two cents per hog, and, after combing, are in four days dry, tied up, and ready for immediate use. The slaughterer delivers the hog, clean and ready for cutting at the door of the packer, for the inwards, fat, &c. In one or two instances, 12 1-2 cents per hog has been given for the privilege of killing, when the price of pork has been high, the same as before, being the slaughterer's perquisites. The quantity of hogs cut in our city last winter, was a little more than 193,000. *The probable quantity this year* will be about one third less than last, say about 130,000, at least this is our opinion.

“The largest cutting or packing establishment now in our city, is the one on the corner of Court and Sycamore streets, built by Major C. S. Clarkson, (as well known perhaps, as the great and successful raiser of Durham Stock,) in the year 1836. This house is 125 feet long by 80 feet, is four very lofty stories high, with a cellar under the whole, ten feet deep. This house is so constructed as to be easily changed into five warehouses; two, 80 by 25, and three 75 feet by 25, (clear.) Last season in this house, by its owner, 15,000 hogs were cut; 3,300 were cut in five and one third days, and on *one* of these days 1420 were cut and put away in a business like manner. Four hundred and twenty barrels were packed on that day, and the hams and shoulders of all, and the smaller sides, (not fit for mess pork)

were all salted and carefully put away ; this required about 45 hands. From the block, the joints, say hams and shoulders, are thrown on a bench where the regular trimmers of each of these parts are stationed. As each ham, &c. is trimmed, they are pushed from the bench and drop through a hole in the floor into the meat cellar, where the salters stand ready to receive, and salt it down, each sort in a separate pile or bulk. The pieces cut up from the sides, for barrellled pork, are thrown into a large box, by which, "the selector" has his scales and weighs off the 200 pounds of each grade for barrelling. This 200 pounds is then put into another box, where the packer has his alum and salt, and by him it is consigned to the barrel ; a cooper stands by, and by the time the next barrel is packed, he has it headed and ready to be rolled out for pickling. In addition to the 50 pounds of Turks Island salt put in the barrel with the meat, the pickle has to be strong enough to keep up a potato or a hog's head. This will secure the meat, for at any rate, six months ; but at the expiration of that time it should be overhauled, and if necessary, have fresh salt, which will most likely be requisite.

"When rolled out, each barrel is laid on its side, a hole by an inch augur, bored, and with a tunnel it is filled with pickle ; then with a pine plug is bunged and ready for shipping. The leaf lard as it is drawn from the hog, immediately on his being split or cut down in half, goes into the adjoining cellar, (to that for the meat) which is appropriated entirely to lard. The scrap lard, that which comes off the butt of both shoulders and hams, also goes with the leaf ; and after having every little part of meat separated from the fat, it, (the lard) is chopped up into small

pieces, say from an inch and a half to two inches square (to facilitate it in rendering) put in barrels or hand barrows, and carried off to the kettles. The small pieces of meat trimmed from the lard are sold to the sausage cutters at about four cents per pound. Four lard kettles of 90 gallons each, will render as much as one set of hands can attend to in the day. As it is melted, it is put in large coolers, usually cut out of a solid log. In the house before alluded to, there are three coolers; one holds about 140 kegs of 42 pounds each, the other two together about the same. When cool enough to run off conveniently, a boy takes two kegs and places under a couple of brass taps, (about two feet apart) so as to be filling two at once for the sake of expedition. If the weather is *very* cold, the lard must be run off during the night, but if not, early the following morning will do.

“The small pieces of skin, meat, and that part of the fat which will not melt, is pressed, and comes out in cakes of from 50 to 80 pounds weight, and are called ‘cracklins,’ worth 75 cents per cwt. These are most excellent food for stock hogs. In cold weather, lard run off into kegs can be shipped two hours afterwards. I once knew in the same house, a large lot of hogs alive on Monday morning, killed on Tuesday, and on Wednesday afternoon the lard and pork manufactured from those hogs were in fine order, and were dashing down the Ohio to the New Orleans market. This was in November, 1838. The joints of meat remain in salt about three days, then are overhauled, and remain for about seven days, then another resalting, and they are safe for three weeks, and may not require any farther attention, till they are washed, (in warm water) and hung

in the smoke house. Five weeks is about the time we let them lay in salt, in Ohio ; this is, however, much too long for small hams. Three weeks is quite enough for hams of from 9 to 12 pounds ; four weeks for those of from 15 to 18 pounds, and five for those of a larger size.

“ The cost of transportation for barrelled pork from hence to New Orleans by steamboat varies, from 90 cents to \$2, according to the stage of the river. I think \$1 12 1-2 is about an average. Lard is from 15 to 20 cts ; average about 25 cts, (gross weight about 52 pounds per keg.) On flat boats, pork is sometimes taken at 75 cents, but about 90 to 95 is the average price. Lard 15 cents per keg. On flats, however, the insurance is double what it is on steamboats, and where time and everything is concerned, I give steam the preference. I should have before stated that it will take about 32 hands to cut up and put away 800 hogs in a day. As they smoke meat better in the east than we do, I will only say that we usually smoke with hickory wood and tan bark, and keep fires up about 21 days, letting them out at night.

Inquiries are often made as to whether pork merchants prefer particular breeds of hogs, on account of feeding, size, age, and breed. I answer undoubtedly we do, respecting the feed of these animals, I would say that a corn fed hog is worth at least a dollar per hundred more than a still, or what is generally called a slop fed hog. If a hog has been put up and fed on slop, for some few weeks, then change his feed to mash, say acorns, beech nuts, &c. &c. of the same kind, then complete his fattening with corn. I can point out to any one the mark of each as distinctly as a river man can point you out the high

water mark on a post on the river bank. Still fed pork shrinks very much in boiling; corn fed will swell out more than shrink. A hog of about 210 pounds neat weight is about as profitable a hog as we can have as to weight. The small boned China hog has been of service in the West, in being crossed with our large coarse hogs. But we find fashions change in regard to swine as well as other things, and the Berkshire has now the preference given him principally on account of size and form; they will grow to the weight of 320 neat weight, and this is as large as we can make them, to be profitable to the feeder, packer and consumer. The Byfield has had his friends, but the great majority are in favor of the Berkshire. A good breed of pigs can be made to weigh, from the day they are pigged till the day they are killed, one pound per day.

CURING PORK HAMS.—The following suggestions from various correspondents, will exhibit the best modes adopted in the preparation of pork and bacon for market. Although the methods given, will be found in many respects, somewhat similar, we have preferred to furnish the opinion of each author in his own words, and shall leave our readers, after a careful comparison of the plans proposed to select according to their judgment. A writer in the *Farmer's Cabinet*,* remarks as follows.

“As soon as the pork becomes cool, I cut and sort it, taking great care to have the tubs perfectly sweet and clean. In cutting, I take out all the spare ribs, and make pickled pork of all the side between the ham and shoulders; cutting it into pieces of suitable size for family use. I trim the hams and shoul-

ders well. I cover the bottom of the tub with rock salt, and then put in a layer of pork, nicely packed ; then cover this layer with salt, and so on until the tub is filled. I use rock salt, and very bountifully. In six or eight days make a pickle of salt and cold water, as strong as possible, and cover the pork previously salted with it. It will then keep for use for years, if you choose.

“ In preparing the hams and shoulders, I weigh several, to come at the probable weight of the whole. They are packed with great care and suitable tubs. My process is to sprinkle some coarse, salt at the bottom ; then pack in the hams and shoulders firmly, side by side, being careful not to put the back of one flat on the top of another. The spaces are filled up with chines, hocks, and jowls. To about every 300 weight of meat I take thirty pounds of rock salt, one pound of saltpetre, and fourteen pounds brown sugar, or half a gallon of good molasses, (generally the latter.) Take as much pure water as will cover the meat, put it in a clean vessel, add the above articles, boil it, removing the scum as it rises, and when no more rises, set it to cool, after which pour it on the meat until it is covered three or four inches.

“ If the hams are small, weighing from 12 to 15 pounds, let them remain in the pickle five weeks—if from 15 to 25, six weeks—if from 25 to 45, seven weeks. When you remove them for the purpose of smoking, put them in clean, cold water for two or three hours. If there is too much salt or saltpetre adhering to the surface of the hams, the water will take it off. The smoke should be made of clean green hickory. A fire should be built only in dry weather. And when the meat has acquired a yel-

low tinge, not red or black, they are removed, and hung up in a dark place where they are not disturbed by flies or vermin."

In the second volume of the same valuable agricultural periodical,* will be found a detail of the modes pursued by Mr T. W. Johnson, of Frederick County, Md., in raising and curing pork. In regard to the latter subject Mr J. writes as follows.

"I have a small and very substantial pen made convenient to the slaughter house, so as to bring them into as small a compass as possible, for the greater facility of catching ; as soon as one is caught he is brought out of the pen and laid upon his back on some loose planks a little elevated from the ground to admit the blood to escape : he is then stuck and held fast until dead ; not permitted to struggle or wallow in his blood or become bruised, as a bruise at that time will be manifest even after it is cooked and brought on the table. As to the mode of scalding and cleaning, &c. &c., it is unnecessary to give any directions. Unless the weather is so cold as to endanger its freezing, it is suffered to hang out all night, so as to become thoroughly cold and stiff, when it will cut up much more smooth and neat. As to the mode of cutting up, I shall say but little. I make six pieces from each hog for salting, the feet should always be sawed off instead of being cut off with an axe or cleaver, as it will leave a smoother surface and prevent any place for the lodgment of skippers. The feet should be cut off a little below the joint.

"The next and most important matter is the salting. It is almost impossible to find two persons who

* pp. 113-114.

agree as to the best mode ; some use fine, some coarse salt, some cayenne pepper, some sugar, some molasses, some nitre, and some none, and some again prefer brining. But as I have promised to give you my method, I shall proceed to do so. After cutting up my pork, I select my hams and shoulders, lay them side by side, skin down, on some loose planks elevated at one end to permit the blood to drain off freely ; they are then salted, or what is called sprinkled, with the best clean Liverpool ground alum salt. After remaining in this situation for two or three days, or until they become perfectly white, they are taken up piece by piece and laid on a clean table ; to each ham and shoulder, according to size, I put two tea-spoonfuls or more of finely pulverized nitre, rubbing with the hand both the flesh and the skin side ; it is then well rubbed with salt and laid in a clean tub—after putting in as many pieces, side by side, skin down, as the bottom of the tub will contain, I fill up all the interstices with salt, then another layer of meat and salt, and so proceed until the tub is full. In four or six weeks, in a good cellar, it will have absorbed as much salt as it ever will, (you see from this remark, I do not believe in over salting hams and shoulders.”)

A third correspondent, in the same volume and number, (p. 162) remarks “ the following is my mode of curing hams.

“ It is plain, simple, and easy to follow. For every ham,* shoulder, or jowl, I take as many handfuls of fine salt, and as many large tea-spoonfuls of pulverized saltpetre ; this is put into a tub and well mixed together ; then pour in as much mo-

* Hams weighing from 12 to 15 lbs.

lasses as will give it the appearance of good brown sugar. With one handfull of this mixture, rub each piece of meat on both sides, and then pack them down in a cask : if any mixture remains, pour it on the meat. Let them remain fifteen or eighteen days. Then take equal proportions of strong ley and pickle that will float an egg or a potato, pour it into the cask until your meat is covered ; place a weight on to prevent it from rising, and let it remain fifteen or eighteen days ; then take it out and let it drain for several days. Hams and shoulders should be hung with the hock downwards. A frame smoke house is much superior to either brick or stone, for smoking meat. Green hickory or sugar maple makes the best smoke. Hams cured according to this receipt, are very superior."

THE EMPRESS OF RUSSIA'S BRINE. This brine has been highly recommended by foreign writers, as an excellent one for pork, &c. The following is the manner in which it is prepared.

"Boil together, over a gentle fire, six pounds of common salt, two pounds of powdered loaf sugar, three ounces of saltpetre, and three gallons of spring water. Skim it while boiling, and when quite cold, pour it over the meat, every part of which must be covered with the brine.

"Small pork will be sufficiently cured in four or five days ; hams intended for drying, in two weeks, unless they are very large. The pickle may be used again and again, if it be fresh boiled up with a small addition of the ingredients. Before putting the meat into the brine, soak it in water, press out the blood, and wipe it clean."

Mr Tomlinson, of Schenectady, N. Y., in a communication to the Cultivator, says: "The following

method of dressing large hogs may be useful to your readers ; if you think so, publish it. After the hogs are laid on the lumber sleigh, or whatever else is used to dress them on, they are dusted over with finely powdered rosin, from a dredging box ; then they are covered with horse blankets, and hot water sufficient to wet them thoroughly, is sprinkled on them with a watering pot. In a short time they will be scalded so that the hair will come off easily, and they will be cleaned as well as in the usual way of scalding in a cask. I received this information from Mr John Clark, who told me he once had a hog which weighed more than six hundred pounds, dressed in first rate style by this method. Also from Mr James Rosa, who a few years since, saw in Boston, Mass., several large hogs completely dressed, in the same manner. These are two of our most respectable farmers."

After hogs are slaughtered they should be permitted to hang a sufficient time to become *thoroughly cooled throughout the entire carcass*. If taken down too soon and the sides closed together, there is danger that the region near the back bone, and the more fleshy parts, will become tainted before the owner is aware of the fact.

As illustrative of these remarks we give the following statements of a correspondent of the *Maine Cultivator*. "A gentleman from Somerset county brought to this market, recently slaughtered, one of the handsomest hogs that ever engaged the attention of our citizens. He was so plump and fat that his eyes were actually grown over. His weight was 506 pounds. A traveller purchased him at an extra price ; but on proceeding to cut him up, it was found that most of the inner depths of flesh were tainted and spoiled. This misfortune was in consequence

of taking the carcass down before it had become thoroughly cooled. The gentleman who brought him to market, on being called to notice the condition of the pork, took the hog back again from the merchant, and in a hot day carted him home again—what to do with him we know not. The loss of fortyfive dollars in a premium hog, for the sake of saving a half dozen pounds weight that might have been drained off, had the carcass hung long enough to become internally cooled, was in this case poor policy—if indeed there was any such motive which governed the proceeding.”

SMOKE HOUSES. Much depends on the proper construction of smoke houses. These buildings are made of stone, brick, or wood,—but the latter material is in general found most suitable to the purposes proposed. Free ventilation is expected in a well constructed smoke house. The roof only should be tight; in every other part openings should be made so as to allow the admission and egress of smoke in, and from, every direction. One of the best smoke houses with which we are acquainted is built as follows. It is formed with a cellar ten feet deep, walled with stones. On this cellar is placed a building, six feet square, boarded in the manner of a barn, but not closely jointed or fastened. The cervices thus formed between the boards afford sufficient ventilation, and the meat is found to dry and smoke thoroughly.

In moderate fall or winter weather, one “smoke” is regarded as sufficient for the space of twentyfour hours—but in severe weather two may be needed. The smallest possible fire should be made that will secure the necessary amount of smoke, and the hams should be suffered to get thoroughly cooled

after each smoking, before another is applied. When the heat is so great as to cause a dripping of the fat, the weight of the hams is diminished, and the flavor injured. Sound maple wood, well *seasoned*, is preferred for the fuel of smoke houses, as it preserves a slow and constant fuel, and communicates no disagreeable flavor to the flesh.