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Omnium rerum, ex quibus aliquid acquiritur, nihil est agriculturæ melius, nihil uberius, nihil homine libero dignius.—Cicero: de Officiis, lib. I, cap. 42.

VOL. II.

HALIFAX, N. S., JUNE, 1876.

No. 123.

In accordance with instructions from the Executive Committee of the Board of Agriculture, the Secretary has entered into correspondence with various Breeders of thorough-bred Stock in England, with a view to an importation this Fall. Enquiries have been specially made respecting Short-horn Durham Bulls and Cows, Ayrshires and Devons, Cotswold and Shropshire Down Sheep and large Yorkshire Pigs. It is believed that all the animals required can be obtained without sending any one home to purchase, the parties from whom it is proposed to purchase being all thoroughly reliable. Arrangements can likewise be made for shipping at Liverpool, and having the animals properly cared for during the voyage. So soon as full information has been obtained, the Committee will be called together to decide upon purchases. Should this importation prove successful, it will likely be followed by regular annual importations, which will certainly be needed if we continue to make advances in the improvement of Stock at the same rate as during the last few years. We hope Societies will husband their funds, and be prepared to give better prices at the coming sale than were realized last October. At public sales in other countries, the tendency among farmers and breeders is to run up the prices of stock to their full value. It is naturally the interest of farmers to do so. But with us the tendency, hitherto, has been rather to depreciate values. A new light is dawning upon our farmers, and we look hopefully forward to a better state of things.

In another column we have reprinted from the London *Agricultural Gazette* an excellent account of recent experiments on the conversion of vegetable foods into animal fat. The point to be determined is whether the carbo-hydrates, such as starch, sugar, gum, &c., which contain no nitrogen, go to form fats, or is the fat merely produced from the albuminoid (nitrogenous) food? Potatoes and Indian corn are rich in carbo-hydrates, whilst wheat and oats excel in albuminoids.

We hope to be able to present to our readers, in next number of the *Journal*, a report upon the State of the Crops throughout the various Counties of the Province. In former years we have been indebted to the kindness of Correspondents in furnishing the necessary information, and we shall feel obliged by a renewal of their courtesies this year. Communications on the Weather and Crops should reach us on or before the 25th day of the month.

GEORGE ESSON, Esq. has made some interesting discoveries among Ferns. The latest is a new locality for the splendid Ostrich Plume Fern, *Struthiopteris Pennsylvanica*, which he found at Five Mile River, Maitland. This fern forms a short stem, from the summit of which the fronds issue as in tree ferns. Mr. Esson not only discovered the *Struthiopteris*, but followed the discovery by a very graceful act. He sent two splendid roots as a gift to the Public Garden, and

supplied all his fern-loving friends as well; even the Editor of the *Journal of Agriculture* was not forgotten. Mr. Power will be pleased to point out the *Struthiopteris* to enquiring visitors at the Public Garden.

DURING the middle and latter part of the month of May the dust clouds in the city of Halifax were so dense that it was only possible to see through the railings of the Province Building at intervals; but this circumstance did not prevent our noticing a conspicuous display of Spring Bulbs, chiefly early tulips, in the flower beds. These early flowers are cheerful at this season, and we often wonder why professional and amateur florists do not use them largely instead of the fashionable bedding plants that only come into flower when people are going away from the city to spend their autumn holiday. The crocus bank on South street was as bright this year as ever.

We have already noticed some of the efforts made by our local Poultry Fanciers to improve the stock by importations of superior classes of Birds from the United States and elsewhere. We have to add that H. Croskill, Esq., Deputy Provincial Secretary, has recently obtained, from the most reliable breeder in England, Ducks and a Drake of the famous Aylesbury breed, noted for their size and beauty, but especially for the delicacy of their flesh. The Pekin Ducks recently imported by Mr. A. Mackinlay, jr., Sunnyside, Dutch Village, have been

laying and hatching. Both Mr. Mackinlay and Mr. Clifford Jack, of Bellahill, have been successful in raising broods of superior Light Brahmas, &c., from imported eggs.

We are requested to call attention again to the propriety of holding a LIVE STOCK SALE at each of the Annual Provincial Exhibitions. The arrangements for such can only be made in the place where the Exhibition is held,—either by the Exhibition Committee or some other local authority. A correspondent suggests that the day and hour of the Stock Sale should be advertised in each number of the *Journal of Agriculture* for at least six months previous to the Exhibition. We are ready to do the advertising so soon as we obtain the information that the day and hour have been fixed. We know of several persons who have animals they wish to sell, and who would be induced to exhibit more extensively if arrangements were made for sale.

W. D. DIMOCK, Esq., Secretary of the Exhibition Committee, writes to us that the Exhibition grounds are progressing favourably. Clearing, draining and grading are being rapidly pushed forward.

The Exhibition Committee appear to be actively at work, and indications come from various quarters that the Exhibition will be successful.

We are authorized to state that "Herds" may consist of animals that have taken prizes under other sections of the Prize List. The rule that the same article [or animal] cannot take two prizes or be exhibited in two collections has never been applied to Herds heretofore, and there is no intention of so applying it at the Truro Exhibition. We make this explicit statement, because we have heard doubts expressed as to the eligibility for the Herd Prize of animals competing in other sections.

We regret very much to have to record the death of the Jersey cow, DAIRY PRIDE, well known in Halifax as the finest animal of the breed ever brought to this Province. She belonged to Alexander Anderson, Esq., Morris street, having been imported several years ago from Jersey, by Messrs. Duffus, Esson and Anderson. She died soon after calving.

Mr. Robert Putnam, Lower Onslow, advertises for sale a thorough-bred Durham Bull, 20 months old,—a thrifty animal.

Mr. Hugh McCulloch, Lower Onslow, advertises for sale a very superior Devon Bull, one year and nine months old, a fine, large, promising animal, from first prize stock.

The following Stud Horses are in service in Pictou County this season:—

The celebrated Stud Horse MARCOLO stands at the proprietor's stables, J. W. Church, New Glasgow. Mr. Church says that for style and weight his equal is not in the Province.

The celebrated Stud Horse GENERAL GRANT will stand during the season at the the premises of James McKay, Millbrook, five days of each week (omitting Wednesday). Mr. McKay says that for size and symmetry General Grant is not surpassed by any other horse in the Province. He weighs 1700 lbs. For draft or carriage he is guaranteed to be very superior.

The young Entire Horse JEFF. DAVIS will stand for the season at Mr. Bryden's, Alma, Middle River, every Tuesday, Friday and Saturday. He is about four years old, was sired by J. Hart's gra-horse; dam, Black Hawk mare. His color is a jet black; stands 16½ hands high and weighs 1200 lbs. Terms \$2 for a single service, or \$4 for the season.

The well-known Stud Horse YOUNG MELBOURNE will travel during the season between West River and Tatamagouche. For particulars see handbills. Isaac Miller, West River.

The Provincial Draft Stallion MARQUIS or LORNE will stand in the County of Pictou for the season. Further notice will be given by handbills. Alex. Ross, Groom, Middle River.

In Colchester County, the Stud Horse BAVRUS, imported by the Central Board of Agriculture in 1875 and now owned by the Onslow Agricultural Society, will be at the service of Members of the Society for the season, on payment of seven dollars. At C. F. Crowe's, Truro, every Monday and Tuesday. At H. Dunlap's, Stewiacke, on Thursday and Friday, 4th and 5th May, and every alternate Thursday and Friday thereafter. At Charles Barnhill's, Lower Onslow, on Thursday and Friday, 11th and 12th May, and every alternate Thursday and Friday thereafter. Isaac Barnhill, Secretary, Onslow.

The celebrated Stallion CAPTAIN DANDY, is 4 years old, 16½ hands, light bay, weighs about 1300 lbs., sired by Blood Horse Roland, imported from England in 1871, sold in 1875 for \$1123.00,—out of a mare (by Saladin) that could trot to wagon in 2:41. Captain Dandy is advertised by Robert W. Dammaroll, (P. E. I.), in the *Truro Sun*, but route is not given.

BRITISH SPLENDOR, imported by the Board of Agriculture last Fall, is now travelling in King's County.

BLACK LION and LION OF CANADA are in service in Cape Breton. DOMINION SPLENDOR in Yarmouth, and SULTAN at present in Halifax County.

MR. EDWARD O'BRIEN of Windsor has a cow 9 years old, sired by the Devon Bull, selected in 1863 by Dr. Hamilton, and out of the somewhat celebrated old O'Brien Butter Cow. She calved on the 30th day of November last, and the following is her butter record since that time.

In December she made	51 lbs.
" January " "	51-8
" February " "	47-6
" March " "	35-14
" April " "	35-7

Making in all in five months lbs. 222-3 oz.

On the 9th of May, from 60 lbs. of her milk were churned 10 lbs. butter.

Mr. O'Brien is raising her calf, (a heifer, sired by a thoroughbred Alderney Bull). She is solid Devon color and very handsome.

THE MORRILL STALLION, Live Oak, is owned by W. H. H. Murray, Guilford, Conn., and has been imported by us under a special arrangement for the improvement of the stock of this section, where he can remain but three months. All who would secure a colt from this splendid Horse, should make application for his service at once.

DESCRIPTION.

Live Oak is of a rich mahogany bay color, with black points, 15½ hands high, and of most magnificent action. In disposition he is perfect; a lady can drive him anywhere, although his courage and resolution are of the most spirited character. He was sired by the famous trotting Stallion "Old Morrill," whose name and fame as a trotter himself, and a parent of trotters, are known to all horsemen. "Live Oak" when three years old, trotted a mile in 2:55 without the least training, he being a *natural* trotter, knowing no other way of going from the day he was foaled. He has never been trained for the track but has been kept solely for stud purposes, save when driven by his owner as his favorite road horse. His speed has never been doubted by any who have seen him move. He is able to pull a road wagon a full mile better than 2:40, any day when in condition. Mr. Murray, from whom we have obtained him for this special season, says of him:

"I have entrusted to your care one of the best stallions in my stables, or the country; he has stood four seasons at the Home Farm, and received a more liberal patronage than any other horse in my stud. His success with average country mares has been remarkable, his colts are large, handsome, docile, and *nearly all trotters*. Seventeen out of every twenty of his get, look, act and move like their sire. I have no horse that I would send with greater confidence to represent my

principles of breeding, than Live Oak, I can not promise that he shall remain with you longer than the middle of August."

PEDIGREE.

"Live Oak" was sired by Old Morrill; he by Jennison Horse; he by One-Eye; he by Bulrush Morgan; he by Justin Morgan, founder of the Morgan family. The dam of Old Morrill, the sire of "Live Oak," was sired by the Farrington Horse; he by the Vance Horse; he by Messenger. The grand dam of One-Eye was Garland, and she was sired by Duroc, he by imported Diomed. Garland's dam was Young Miller's Damsel, sired by Hambletonian; he by imported Messenger. Young Miller's Damsel's dam was Miller's Damsel, sired by imported Messenger, out of imported Pot 80's Mare. It will be observed that "Live Oak," on his sire's side, runs back through three strains to imported Diomed, and also three strains to imported Messenger.

The dam of "Live Oak" was sired by the Judvine Horse (see Linsley's book, p. 315); he by Vermont Champion; he by Vermont Morgan Champion; he by Sherman; he by old Justin Morgan. The dam of "Live Oak's" dam was a most remarkable mare for endurance and speed. She was kept in the Haines family until she was thirty-two years of age, at which time she was healthy and vigorous, but soon after, unfortunately, broke a leg, and was killed to relieve her of pain. Her skin was stuffed, and is still preserved.

"Live Oak" will serve mares at the following rates:—Terms: Single Service, \$15.00. Services for the Season, \$25.00. Cash or Note at the time of Service. Book now open and rapidly filling. Number of mares limited. For further particulars, address

HENRY VAN RUSKIRK,
Melvern Square, Wilmot.

WINDSOR, MAY 31, 1876.

WM. DUFFUS, Halifax.

DEAR SIR.—The Morrill Stallion "Live Oak" is now in Windsor, at the stables of E. A. McBride, where he will remain until Thursday noon when he will leave for the subscriber's stables, Melvern Square. This horse is here only for this season, and horsemen should be up and doing. Are there any mares in Halifax? if so, I would plan to be in Windsor every fortnight during the season. Please let me know and exhibit these cards, and oblige yours, &c.,

HENRY VAN BUSKIRK.

THERE is an unusual mortality among cows this season. In Halifax County, especially along the Windsor and Hammond's Plain roads, a large number have died either before or immediately after calving.

WE have received the following from W. D. Dimock, Esq., Secretary of the Provincial Exhibition to be held at Truro in October next:—

Model School,
Truro, May 6th, 1876.

Would you kindly oblige by stating in the *Journal of Agriculture* that the Vick Prizes in the Flower Department in the Prize List of '76 are only for "amateurs," not for professed gardeners or horticulturists.

Also, that the "Maitland Improved Horse Stock Co." have offered the following prizes:—

Best Knox colt got by "Jim Fisk":
1st..... \$30
2nd..... 20
3rd..... 10

WE have been favoured by William Duffus, Esq., with the following pedigree of Horses recently imported by him from the United States:—

DANDIE DINMONT.

Dandie Dinmont, brown stallion, by Maine Slasher, out of the thoroughbred mare Vistula, by imported Scythian. Dandie Dinmont was bred by General W. S. Tilton, of Togus, Maine, U. S. Sold to J. B. North, Hantsport.

RICE MAMBRINO.

Rice Mambrino was bred by George T. Allman, of Giles Co., Tennessee. Sired by Henry Mambrino, sired by Mambrino Chief, the sire of Lady Thorne.

Dam—Fanny Porter.

g. d.—Fanny, by Timolean,
g. g. d.—Fanny, by Pantaloon, sired by imported Diomed.
g. g. g. d.—Jennet, by Muzzle Diomed, son of imported Diomed.
g. g. g. g.—By Wiks Wonder, the sire of Tenu. Oscar.
g. g. g. g. g.—By Sir Archie.

I certify the above pedigree correct.
(Sgd.) BRAD. W. PORTER.

I certify the chestnut colt, Rice Mambrino, sold to General W. S. Tilton, Togus, Maine, was got by Henry Mambrino, out of the above mare Fanny Porter.

(Sgd.) GEO. T. ALLMAN.
Cometsville, Tenn.,
March 20th, 1876.

Rice Mambrino is a handsome chestnut stallion, has size, style and plenty of substance, with splendid trotting action, possessing all the finish of a thoroughbred, and is pronounced by horsemen to be the best stallion of his age in the Province. Sold to Robert Bacon, Windsor.

OUR readers may like to hear the results of the Ayrshire Derby of the present year:

Ayr, April 26.—The show of stock was, thanks to the brilliant weather, a great success. So far as the entries are concerned, there was an advance in all departments over those of last year. In cattle there were 469 as against 454 in 1875, 284 horses compared with 263, 198 head of sheep as against 132, 30 pigs, or an increase of 18; and 137 dogs, being 13 more than at the previous show. The animals shown were all of the highest class. It was stated by the judges that the Clydesdale horses for numbers and quality were a credit to any show, while the Ayrshire cattle, which may be described as the great feature of the display, were, according to the best authorities, the finest stabled since the institution of the Society. There was a splendid collection of blackfaced sheep, and the fat stock were a great improvement on former lots forwarded. The competition of chief interest among the Ayrshires is the DERBY, for which there were 156 entries, and of these a hundred were forward—a very large proportion, considering that they are entered when calves. The class was an excellent one, embracing animals from Ayr, Carrick, Cunnock, Kilmarnock, Dalry, Athole, Renfrew, and Wigtown districts. After two hours and a-half labour the cow selected by the judges for the £20 premium was a beautiful rich red and white, the property of Mr. James Brown, Cartleburn. She exhibits much fine breeding, and her symmetry is remarkable. With a very sweet head and horn, she has a nice neck, flat shoulder, great breadth across the torr and udder, whose size and shape is unexceptionable. She was bred by Mr. Brown, out of one of his own cows by a bull from Burghouses, and she shows much of the style of Mr. Howie's famous herd. The 2nd prize fell to an almost pure white cow, with brindled head, belonging to the Duke of Buccleuch. Mr. J. Murray, Carston, was 3rd, with a white and red. The 4th ticket fell to a yellowish red cow, the property of Mr. Wyllie, Holmbyre. Aged cows in milk come next on the list, and out of a class of 30 or 40, Mr. John Holm, Japston, carried the honours with a brindle and white possessing much style of the true Ayrshire type. The 3rd prize was awarded to Mr. T. Lindsay, Townend, for the cow that was 2nd in last year's Derby. About 30 were forward in the class for aged cows in calf, and the red ticket fell to the Duke of Buccleuch for the pretty red and white which won the gold medal at the Highland Society's show at Glasgow, and took leading honours at almost all the principal shows. Mr. W. Brown carried off the 2nd prize with a dun and yellow cow, not large in size, but of striking symme-

try and splendid coat of hair. The 3-year olds in milk and calf were both numerous and good. The show of aged bulls was very meagre—indeed, we have seldom seen it so small, nor after the first two prize animals was the quality up to the mark. Mr. W. Smith was 1st with the Shaw, which was 2nd at Glasgow and Ayr last year. The 2nd prize fell to a black and white jaunty bull belonging to Mr. R. Gillespie. There was a better turn-out of 2-year old bulls, and first honours fell to a white bred by Mr. Macgilvray, near Lanark. The Duke of Buccleuch came 2nd with a white and brown bull. Mr. Howie's 3rd prize black bull has much of the Highland character, which gives him a picturesque look. The bull strikes numbered 50, and they formed a magnificent show. Mr. J. Murray secured the 1st prize for a white and red yearling, almost perfect in shape and quality, and he was bought at once by Mr. Hunter for Mr. Allan, Montreal, at £50. The 2-year old queys formed a nice display—the Duke of Buccleuch taking 1st and 2nd prizes with the pair of beauties which occupied the same relative position at Glasgow last year, though their places were reversed as yearlings at a previous Ayr show. The Shorthorns were a small but fair show, and a great improvement was manifest in the fat stock.

At a recent meeting of the Botanical Society of Edinburgh, Mr. McNab, Curator of the Royal Botanic Garden, read the following Notes on Garden Vegetation for March, 1876:—

March, it may be said, was very rough, attended with much snow, rain, wind, and frequent frosts, which proved a great hindrance to the progress of vegetation and all out-of-door works. On twenty-one mornings the thermometer was at or below the freezing point, indicating collectively 98°; the lowest markings being on the 13th, 16th, 17th, 19th, 20th, and 21st, indicating 23°, 15°, 24°, 25°, 23°, and 20°. The highest temperatures occurred on the 1st, 2nd, 3rd, 4th, 6th, and 30th, when 38°, 36°, 37°, 38°, 37°, and 38° were respectively indicated, all being under the morning temperatures for January. During March, 1875, the thermometer was ten times at or below the freezing point, indicating in all 45°. The following table shows the amount of frost that occurred during the months of March for the last thirteen years:—

Year	Frost	Year	Frost
March, 1864	71°	March, 1871	28°
" 1865	52°	" 1872	23°
" 1866	68°	" 1873	25°
" 1867	77°	" 1874	37°
" 1868	29°	" 1875	45°
" 1869	57°	" 1876	98°
" 1870	50°		

Herbaceous plants this year are rather behind an average, and those which have flowered are far from being in a satis-

factory condition, both February and March having been much against them. In the next column is a list of spring plants, the flowering dates of which are annually reported.

	1876.	1875.
<i>Scilla bifolia major</i>	March 2	March 14
<i>Arabis alba</i>	March 5	Feb. 10
<i>Tussilago alba</i>	March 8	Feb. 15
<i>Mandragora officinalis</i>	March 12	Feb. 25
<i>Iris reticulata</i>	March 13	March 19
<i>Symphitum caucasicum</i>	March 15	March 31
<i>Narcissus pumilus</i>	March 15	March 13
<i>Scilla bifolia alba</i>	March 16	March 17
<i>Tussilago nivea</i>	March 18	March 6
<i>Muscari botryoides</i>	March 18	March 26
<i>Corydalis solida</i>	March 25	March 23
<i>Nympholaceus fastidius</i>	March 25	March 30
<i>Erythronium dens canis</i>	March 30	March 21
<i>Iris sanguineum</i>	March 30	March 30

In the rock garden seventy-four species were counted in flower on March 31. The most conspicuous were *Iris reticulata*, *Scilla sibirica*, *S. bifolia*, *S. b. major*, *S. b. alba*, *Sisyrinchium grandiflorum album*, *Gagea lutea*, *Helleborus angustifolius*, *Hepatica angulosa*, and all the varieties of *Hepatica triloba*, also the varieties of *Saxifraga oppositifolia*; *Aubrietia grandiflora*, *Primula vulgaris rubra*, *P. purpurea*, *P. denticulata*, *P. nivalis*, and *P. viscosa*; *Draba aizoides*, *Dondia Epipactis*, *Andromeda floribunda*, *Erica hibernica spicata*, *E. herbacea alba*, and *Epigaea repens*. Up to the end of March no perceptible difference was noticed in the arboreous vegetation. Perhaps the most remarkable feature observed was in the case of those coniferous plants which take on a brown hue during the late autumnal months, and remain in this condition during winter; as the season advances they pass into green, and finally into the golden tint peculiar to them, and which they retain during the summer months. In my report up to January 31 it is there stated that, owing to the unusual mildness of that month, *Thuja aurea*, *T. elegantissima* and others, had parted with the brown winter hue, and were on January 31 perfectly green. Since that time the backward state of the weather, attended with a series of low temperatures, has been the means of partially bringing back the brown tint, but not to the extent observed during the early winter months, still a very perceptible brown hue is visible on each of them. It is now evident that many plants have suffered severely during the long and very changeable winter, particularly those species belonging to the natural orders *Caryophyllaceae* and *Crucifere*.

It is somewhat remarkable that during the last three months we have had the thermometer on fifty-two mornings at or below the freezing point, indicating altogether 314°, and, notwithstanding this low average, no ice at any one time has been seen at Edinburgh sufficiently strong for skating or curling purposes,

nor yet have any of the frosts been sufficiently severe to reach the small vermin now in the ground, not even the slugs, which at the present time (March 31) are particularly numerous and destructive.

AGRICULTURAL CHEMISTRY.

PRODUCTION OF FAT.

PROFESSOR WOLF, in his recent work (*Landwirthschaftliche Fütterungslehre*), after glancing at the various investigations made on the formation of fat in animals, says that the only experiments which seem to afford any real evidence of the formation of fat from the carbohydrates, are those made on fattening pigs; that here the increase of the body is so rapid in proportion to the food consumed, that if we assume for that increase the composition derived from Lawes and Gilbert's experiment, we must admit that in many cases fat is entirely formed from carbo-hydrates. He adds that accurate experiments with pigs are greatly to be desired. In the present paper we propose to describe in some detail the recent experiments on pigs made by Weiske and Wildt, two well known German investigators, and to compare their results with those formerly obtained by Lawes and Gilbert.

There are two methods by which the formation of fat from any particular food may be determined. The first is by placing the feeding animal from time to time in a respiration chamber, and ascertaining the exact proportion of nitrogen and carbon which are retained in the body. The second is by taking animals as nearly alike as possible, killing one lot, and determining the amount of nitrogen and fat in their bodies, then feeding the similar lot on the experimental food for a more or less considerable time, and finally by killing them and analysing their bodies, to ascertain the amount and character of the increase which the animals had acquired from the food consumed. In the investigation by Weiske and Wildt the second method was adopted.

Four weeks' old pigs of an English breed were taken; two were killed; in one the fat only, and in the other all the constituents were determined. The remaining two were fed for six months, one on a diet rich in nitrogen, the other on one poor in that element. The pig supplied with the rich nitrogenous food failed in health, and this part of the experiment was discontinued. We may confine therefore our attention to two pigs; the first, weighing 18.5 lb., was killed and analysed; the second, weighing 18.4 lb., was fed for six months and then killed and analysed.

The diet employed during the first two months was a mixture of two parts of starch and one of rye bran, the diet during the last four months consisted of boiled potatoes. The percentage composition of the foods in the dry state was as follows :—

	Rye bran.	Starch.	Potatoes.
Albuminoids	17.27	1.33	0.81
Fat	3.34	..	5.58
Fibre	0.30	..	2.82
Non-nitrogenous extractive matter	07.05	98.10	82.80
Ash	5.05	.48	4.61

On this low diet the pig was quite healthy, and gained steadily but slowly in weight. In the whole of the experiment (184 days) the increase in live weight amounted to 38.1 lb., which was at the rate of 1 lb. increase for 9.252 lb. of dry food consumed.

From time to time the fæces were collected, weighed, and analysed; from the data thus afforded the amount of digested food was determined. The digestion of the potatoes was very complete. The following table shows the proportion digested for 100 of each constituent of the food consumed, in the first two and last two months of the potatoe feeding :—

	Total Dry Substance.	Albuminoids.	Crude Fat.	Fibre.	Extractive Matter.	Ash.
Period I. ...	94.4	81.5	24.1	59.7	93.6	62.5
Period II. ...	96.5	83.1	35.6	83.2	99.2	81.0

At the end of six months' feeding the pig was killed, and its body analysed; it contained 7.0138 kilos. of fat. The fat in the pig before feeding commenced was, according to the two well agreeing determinations, on similar pigs, .8740 kilo.; there had been stored up, therefore, during feeding, 6.1398 kilos. of fat. The fat furnished to the animal by the digested food was .5748 kilo.; the quantity of fat actually produced in the animal was, therefore, 5.5650 kilos. The digested albumin was 14.3244 kilos.; of this, 1.2425 kilo. had been deposited on the body, leaving 13.0819 kilos. available for the formation of fat. Reckoning 100 of albumin as capable of yielding 51.4 of fat, the available albumin would be sufficient to produce 6.7241 kilos. of fat; only 5.5650 kilos. were, however, produced in the body; experimenters therefore conclude that no proof of the conversion of carbo-hydrates into fat was afforded by the experiment.

There is one source of error in the calculation just described which must not be passed unnoticed; it is that the whole of the nitrogen in the food is assumed to exist in the form of albuminoids. That the whole, or almost the whole, of the

nitrogen in cereal grains exists in the form of albuminoids is probably true, but in the case of all green produce, whether roots or fodder, it has been long known that more or less of the nitrogen present is in the form of nitrates and other in-nutritious compounds. Church, and Schulze, and Ulrich, have lately shown that 30—77 per cent. of the nitrogen of roots (turnips, swedes, mangels), does not exist as albuminoids. Professor Church, who is at present investigating the subject, has informed the writer that in an analysis of potatoes he found that only 52.08 per cent. of the nitrogen existed as albuminoids. What may have been the proportion of true albuminoids in the potato tubers used by Weiske and Wildt it is impossible to say, if the proportion of nitrogen existing as albuminoids was the same as in the tubers examined by Professor Church, it is clear that the albumin present was quite insufficient to account for the fat produced, and that in fact 2.3691 kilos. of fat must have been formed out of the carbo hydrates. It is quite plain that only the albuminoids actually existing as such should be reckoned in these calculations.

Lawes and Gilbert published in 1852 an experiment on pigs conducted in a similar manner. Two pigs, of the same litter and of similar weight, were taken, one slaughtered and analysed, the other fed for 10 weeks and then slaughtered and analysed. The pigs in all the experiments of Lawes and Gilbert were older than those taken by Weiske; the pig taken in the present instance for fattening weighed 103lb, and was about four months old. The pig was fed on a mixed food consisting one half of barley meal, the other half being equal parts of bean meal, lentil meal, and bran; the food was thus tolerably rich in nitrogen. The increase or weight in 10 weeks was 88lb, or at the rate of 1lb for 4.78 of dry food consumed; the rate of increase was thus nearly twice as great as in Weiske's experiments. In Lawes and Gilbert's experiments the fæces were not analysed (no results have at least been published), and the percentage of food digested was, therefore, not known. In the calculations which follow it is assumed that the whole of the food was digested, which was, of course, not actually the case. The analysis of the bodies of the pigs showed that 100lb of increase contained 63.1lb of fat; to produce this amount of increase there would be consumed in the food 15.6lb of fat, leaving 49.5lb of fat as the quantity formed in the animal. The amount of albuminoids consumed to produce 100lb of increase was just 100lb, of which 7.8lb was stored up in the animal, leaving 92.2lb available for the formation of fat. If we reckon with Henneberg, and other Ger-

man physiologists, that 100 of albumin will yield 51.4 of fat, then 47.4lb is the whole amount of fat the albumin could yield. The amount of fat formed in the animal we have already seen to be 47.5 lb. When we recollect that the whole of the fat and albuminoids of the food were certainly not digested and taken up by the animal, it is evident that the fat and albumin of the food do not, in this case, fully account for the fat produced, but that there is here a small margin for the production of fat from carbo-hydrates. The experiment just described was not designed as a test of the fat-producing power of carbo-hydrates; had this been the case a less nitrogenous food would doubtless have been employed.

The above is the only experiment of Lawes and Gilbert, in which the bodies of the animals were analysed, and the fat produced accurately determined. If we assume in the other feeding experiments with pigs, that the animals when put up for feeding had the same composition as the store pig already analysed, and that the animals when fat had the same composition as the fat pig already analysed, it would then appear that a large proportion of the fat produced must have been derived from the carbo-hydrates of the food. It is clearly dangerous to found important conclusions on data involving such assumptions; we will, however, give the results of two feeding experiments, in which the weights of the pigs at starting, the length of the period of fattening, and the rate of increase obtained, were quite similar to the corresponding conditions of the experiment in which the bodies were actually analysed.

Three pigs of an average weight of 95lb were fed for 10 weeks on a limited quantity of lentil meal and bran, with as much sugar as they liked to consume; their average increase in live weight was 83lb; 1lb of increase was yielded by 4.27lb of dry food. Assuming that the bodies of the pigs had the same composition as in the first mentioned experiment, 100lb of increase would contain 74.1lb of fat, deducting from which the ready formed fat in the food, we have 56.2lb as formed in the animal. The albuminoids in the food producing this amount of increase were 81lb; deducting 7.5lb stored up, we have 73.5lb available for the formation of fat; this quantity is equivalent to 37.8lb of fat, leaving 18.4lb of fat to be formed from the carbo-hydrates, or about one-third of the whole fat produced.

Three pigs of similar weight, and fed on the same diet as above, but starch substituted for sugar, yielded almost precisely the same rate of increase. The amount of fat formed in the body was 56lb for 100 of increase; of this 37.7lb

might be contributed by the albuminoids if they were entirely digested, leaving 18.3 lb. to be formed from carbohydrates.

While these early experiments of Lawes and Gilbert with pigs do not actually demonstrate the formation of fat from carbohydrates, they certainly make it very probable that fat is formed from these bodies in the case of a rapidly fattening pig, and they clearly point out the manner in which the crucial experiment should be conducted. The experiment should not be made on a very young pig, but on one which has so far developed its frame that fattening rather than growing may be expected. The food should also be of a very nourishing quality, but containing as little nitrogen as is consistent with this character; good barley meal, without any farther mixture, would excellently fulfil these requirements. It is evident that Weiske and Wildt, by working on very young animals, and employing a food poor in quality, which gave only a slow rate of increase, had not the conditions favorable to rapid fattening which are essential to a satisfactory solution of the question.

It will be interesting in conclusion to give the percentage composition of the bodies of pigs of various ages and fatness, as now determined by Weiske and Wildt, and Lawes and Gilbert:—

PERCENTAGE COMPOSITION OF ENTIRE PIGS, CONTENTS OF STOMACH AND INTESTINES ALONE DEDUCTED.

Age of Pig.	Fasted Live Weight.	Water.	Nitro-Genous Matter.	Undeter- mined Matter.	Fat.	Ash.
	Lb.					
6 weeks	18½	73.4	11.84	.66	0.94	3.86
7½ months .. .	56½	62.2	9.61	1.63	26.12	1.64
About 4 months	103	58.1	14.45	..	24.50	2.82
About 6½ months	191	43.0	11.34	..	43.98	1.72

PERCENTAGE COMPOSITION OF DRY MATTER.

Age of Pig.	Nitro-Genous Matter.	Undeter- mined Matter.	Fat.	Ash.
6 weeks	44.51	3.61	37.37	14.51
7½ months .. .	22.51	4.05	69.10	4.34
About 4 months	34.52	..	54.74	6.74
About 6½ months	19.90	..	77.08	3.02

PERCENTAGE COMPOSITION OF INCREASE DURING FAT- TENING BOTH IN ITS FRESH AND DRY STATE.

	Water.	Nitro-Genous Matter.	Undeter- mined Matter.	Fat.	Ash.
Weiske and Wildt..	56.75	6.88	1.81	34.00	.56
Lawes and Gilbert..	28.61	7.66	..	63.10	.53
Weiske and Wildt..	..	15.91	4.90	78.01	1.29
Lawes and Gilbert..	..	10.87	..	83.39	.74

The nitrogenous matter in Weiske's investigations was calculated by multiplying the nitrogen by 6.25; in Lawes and Gilbert's analyses the nitrogenous matter is

obtained by differences. To make a strict comparison between the two sets of analyses, the undetermined matter should perhaps be added to the nitrogenous matter in Weiske's results.

These analyses illustrate the fact that as an animal increases in maturity the percentage of water diminishes, while in the dry substance, nitrogen, and ash fall, and the proportion of fat rises. The great difference in the composition of the increase in the two experiments, teaches the necessity for always determining the nature of the increase by direct experiment in trials of this character.—R. W.

THE following bit of Horse History, from the *Spirit of the Times*, will be read with interest by horsemen:—

"The King is dead—Long live the King."

Rysdyk's Hambletonian died during the night of March 26, at the home of his lifetime, Chester, Orange county, N. Y., in his twenty-seventh year. His influence in the stud has marked an era in trotting history, and in the future he will be looked back to as one of the greatest representative horses of any age. We do not say that "take him for all in all, we never shall look upon his like again," but take him thus and we might not readily name his like in all we have ever yet looked upon. In turn, Lady Suffolk, Flora Temple, Dexter and Goldsmith Maid have been the pride and glory of the trotting turf, but that glory, brilliant as it was, could not outshine the light of Hambletonian's glory in the stud. He has been the pride of a nation of breeders, and his blood is valued as drops of gold, and will be handed down to future breeders as more precious than the metal.

Hambletonian was foaled May 5, 1849, the property of Mr. Jonas Seely, of Goshen, Orange County, N. Y. When but a few weeks old he was purchased with his dam, by the late Mr. William M. Rysdyk, of the neighboring town of Chester, the price being \$125 for the mare and foal. Hambletonian was got by Abdallah, whose fame at that time was already great as a sire, though he was passing into the seer and yellow leaf, and died two years after Hambletonian was foaled. The dam of Hambletonian was known as the Charles Kent mare, and he was the youngest of several foals that she bore. She was a mare of fine speed, and had a high reputation as a roadster about New York City. She was got by the imported Bellfounder, dam One Eye, by Bishop's Hambletonian, grandam Silvertail, by imported Messenger. As Bishop's Hambletonian was by imported Messenger, and Abdallah was by Messenger's son, Hambletonian affords an instance of

triple inbreeding to the great gray that crossed the Atlantic in the latter part of the last century, whose name is a tails man for trotting value, yet never so great as when derived through Rysdyk's Hambletonian.

In his latter years Hambletonian gave but partial warrant in his appearance of the grand horse he was in his prime. We first knew him then, and so long as memory holds her seat we shall never fail to recall his looks, bearing and action, so vividly were they impressed upon our mind. In all our experience of horses we never studied one more closely, because, from first to last, we never saw one that we regarded as in all respects his peer.

Mr. Rysdyk was wont to say that when he purchased Hambletonian, as a suckling, he was much influenced to do so by the fact that Abdallah's great merits were beginning to be understood, and that he was declining into old age with but few entire sons to perpetuate his line. Asperity of temper caused most of them to be castrated young, but he trusted to the ameliorating influence of the fine-tempered Bellfounder cross to correct the tendency in Hambletonian, and it fully bore him out, for a better dispositioned horse never breathed. He has transmitted the hard-fibred texture and speed qualities of Abdallah with the fine temper and more comely formation of Bellfounder, blended with the greatest nicety, and united with an iron constitution and longevity that might with equal propriety be credited to either. The foal Hambletonian grew apace, and with an evenness of development that made him attractive to the eye and gathered ample admiration from the horsemen of the vicinity, until he became two years old. At this period he was bitted, and led in tackle by the side of another horse, in which manner he soon learned to show a great deal of speed, which increased in practice, until, in his three-year-old form, the old pacer that Mr. Rysdyk rode in leading him was no longer able to be his company. At two years old he got a small number of foals, among them Alexander's Abdallah, that lives in history as the sire of Goldsmith Maid, Rosalind, etc. At three he was taught his first lessons at drawing a vehicle, and, we believe, got Volunteer, though the books place him a year later. That fall, Mr. Rysdyk showed him at the New York State Fair, held at New York City, insigated to this action by his friend and neighbor, Mr. Seely C. Roe, who owned another son of Abdallah, called Roe's Abdallah Chief, then five year old, which was also shown. After the fair was over, both horses were taken to the Union Course on Long Island to be given a

trial. Mr. Rysdyk, who was a great home man, was loth to remain away from Orange County for this purpose, but yielded to Mr. Roe's solicitation, in hopes, as he urged, it would teach the colt something. Much to Mr. Roe's surprise, Hambletonian beat his horse in a little slower than 3:00. Somewhat nettled at the result, he drove Abdallah Chief a trial alone, and so far improved upon his first effort as to complete the mile in 2:55½. Mr. Rysdyk then drove Hambletonian a trial in 2:48. This was the concurrent testimony of Mr. Rysdyk and Mr. Roe, after the stallions had grown to be rivals. The result had the effect to create some coolness between the owners, and, subsequently, Mr. Rysdyk published a challenge in his stud bills, to trot Hambletonian two named races against Roe's Abdallah Chief; or, failing to secure those engagements, would match him to beat 2:40, for \$5,000. He was never started, however, and died without securing a turf record, though his descendants head the lists.

Some years ago we described him in *The Spirit*, and will now reproduce that description in modified form: In the prime of life Hambletonian was a deep rich colored mahogany bay horse, 15½ hands, with black legs, mane and tail, the color of his limbs extending well above his knees and hocks. He had a small star, and two white socks behind, extending to the top of the ankle-joint, but the coronets were dotted with black, so that each hoof was in good part black, or rather of a deep bluish slate color. His head was large and bony, with a profile just inclining to the Roman order, with somewhat deep jowls, yet as widely spread as many would desire, yet not deficiently close. Eye very large and prominent, giving him an appearance of much greater width across the forehead than would otherwise have shown. His ears were of good size (not as large as many unobserving persons have pronounced them), well set and lively. They were not over long, and were peculiar in the fact that they rose evenly on both sides, having none of that crook or notching out towards the point so frequently noticed in the Abdallah ear. His muzzle was dark colored, and rather broad, nostril full and expansive. Neck rather short, a little heavy underneath, but clean and sharp at the crest. His mane was very ornamental in his younger days, straight haired and rather light, like that of the blood horse, but uniform in length, never reaching the lower line of the neck. He was predisposed to baldness of the crest, and his mane had entirely disappeared some years since. His foretop, at rays light, had nearly gone. His tail was long, and in former years quite full, clear to the ground. It appeared to have

no short hairs in it, all reached to his ankles, and hung as straight, black and free from wave or curl as the war-lock of a Mohawk Indian. It remained ample, though not as heavy as in years past, to the time of his death, and showed no tendency to the baldness which marked that of Abdallah, and so many of his descendants. His shoulders were fairly oblique (as he settled in his back with age, they became very much so), deep and strong. The upper points of the blades were well apart, giving him a low broad formation through the top of the shoulders, with next to no wither, sway short, and coupling smooth. His well-sprung ribs, topped with great fillets of muscle, running back along the spine, gave extraordinary width to the loin, threatening to lose the closely set hip in the wealth of its embrace. Still back of there it swept away into the immense and powerful machinery that, imparted to his sons and daughters, has ever placed them in the foremost rank of trotters. His hip was long and croup high, with great length from hip-point to hock. Thighs and gaskins harnessed with the sinewy muscle, which extended well down into large clean bony hocks hung near the ground. Below, the leg was broad, flat and clean, with tendons well detached from the cannon-bone, and dropped under him at a considerable angle with the upper limb, giving him the well bent rather than the straight hock. Pasterns, long but strong and elastic, and let into hocks that were perfection in shape and quality of horn. In front his limbs and feet comported in strength and muscular development with the rear formation. He was a heavy boned horse, with large well-formed knees and hocks. The texture of his limbs throughout was so fine, clean, and ivory-like, that we have never seen in those of any other animal as much substance in so blood-like form. There is no long hair at the fetlock, though the shears never touched them; no gumminess or adipose deposits were lodged about his legs or joints. No sculptor ever carved from marble, or fashioned in bronze, so fine a modeled limb and foot. A few years ago his forefeet were destroyed by a radical operation performed by Dr. Dunbar. It was, doubtless, necessary at the time, to save the horse's life, but so permanently mutilated them that they afterwards gave but faint idea of their natural strength and perfection, which we have only seen paralleled in those of Gloster and one other animal.

His chest was broad and prominent, with forelegs well apart, and he was deep through the heart. Notwithstanding this, and the fact of his roundness of barrel, there was no appearance of heaviness or hampered action when he moved. The casual observer might think for the

moment, as he saw him in perfect repose, that he was too massive for action, but the instant he moved the thought was dispelled, for he was *all* action. Taken at a glance, the impressive feature of the horse was his immense substance, without a particle of coarseness or grossness. No horse that we can recall possesses so great a volume of bone with the same apparent texture and true blood-like quality. Though short backed, he was very long underneath. He always stood considerably higher over the rump than at the withers, and the whole rear, or propelling part of the machinery was sometimes called disproportionately large on that account, but the eye failed to detect any deficiency or want of size in front, save that his withers were low. The immense strength of his shoulders and foreleg compensated in full for want of height at the withers, and kept good the symmetry of contour and perfect balance of action. As an evidence of the immense reach which his admirable rear construction enabled him to obtain, it was often noticed, by visitors, that in his favorite attitude, as he stood in his box, his off hind foot was thrown forward so far under him as to nearly reach the one in front of it, an attitude which few horses of his proportionate length, could take without apparent effort, yet which he assumed at perfect repose.

Standing behind him, he appeared rather narrow across the hips, but rounded up smooth between. Below, his quarters were full, and, he was always kept in stud condition, somewhat beefy. His stifles and gaskins, arched out with muscle, gave him an appearance of power. We remember him in the old days, when the pride of his strength was upon him, led forth by his faithful colored groom, Harmon Showers, who for more than twenty years, has alone cared for him. Horse and man were a splendid pair in physical power. The walk of Hambletonian was different from that of any other horse. It cannot be described further than to say that it showed a true and admirable adjustment of parts, and a perfect stability and elasticity of mechanism that showed out through every movement. Many have noticed and endeavored to account in different ways for this peculiarity, some crediting it to the pliable pastern, others to a surplus of knee and hock action, but in fact the trait is not limited to the influence of any one part. There seems to be a suppleness of the whole conformation that delights to express itself in every movement and action of the horse. Bounding with animal spirits, as his groom led him back and forth, he has many a time charmed us with his action and display of power, while the control which Harman possessed over him was marvellous. The man

was a very Hercules in strength, and lithe as a cat, yet "Whoa, old horse!" uttered in the deep guttural voice, derived from the Iroquois blood mingled with his African parentage, had more power to control the eager spirit of the horse than even the strength of his massive arm, which, bared to the elbow, might have excited the envy of Mars himself. The same words given in playful tones would send the horse bounding again. Great good feeling existed between Hambletonian and Harmon. For many years before his death the horse would steadily refuse to eat food placed before him by any other hand.

What an influence will follow the work of "the old hero of Chester."

"The Avon to the Severn runs,
The Severn to the sea,"
And Wickliff's blood shall spread abroad
Far as the waters be."

THE *Western Rural* tells of a man who plants, two or three weeks after the crop is planted, a new hill of corn every fifteenth row, each way. And this is the reason: If the weather becomes dry after the filling time, the silk and tassels both become dry and dead. In this condition, if it should become seasonable, the silk revives and renews its growth, but the tassels do not recover. Then, for want of pollen, the new silk is unable to fill the office for which it was designed. The pollen from the replanted corn is then ready to supply silk, and the filling is completed. He says nearly all the abortive ears, so common in all corn crops, are caused by the want of pollen, and he has known ears to double their size in thus filling.

THE sixth volume of the American Jersey Herd Book is now in course of preparation. The five previous volumes, bound in one book, contain 3224 pedigrees numbered, also the descriptions of many animals. In compiling the sixth volume, the Editor has had the counsel and co-operation of an advisory board of prominent breeders from each of the several States where breeding Jersey cattle is receiving attention, and the work will consequently possess additional merit and value. It is to be continued in the future, as in the past, without ostentation, in the quiet pursuance of a purpose which we hope will be commended by all whose object is the improvement of Jersey stock and the dissemination of information concerning it. The Editor is Mr. O. B. Hardwen, of Worcester, Mass.

An American Merino Sheep Register has been established. The method seems to be to identify every ewe as thoroughly bred by placing a tab in the ear. The rams are named, like cattle.

It will be seen from a report in another column that the first May flowers of the season were in bloom on the rock work in the Edinburgh Botanic Garden on 31st March.

WE are indebted to W. H. Blanchard, Esq., Windsor, for interesting particulars of the quantity of butter produced by Mr. O'Brien's cow, which will be found in another column.

THE other day we noticed the Cowslips smiling as sweetly on the sunny banks of Bellahill as if they were at home, nestling under the hedge of an English lane.

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