THE

Canadian Agriculturist,

OR

JURNAL AND TRANSACTIONS OF THE BOARD OF AGRICULTURE

OF UPPER CANADA.

)L. XIV. TORONTO, APRIL 1, 1862. No. 7.

e Cultivation and Preparation of Flax.

(*Continued from page* 167.)

Conversion of the Straw into prepared bre.—The first operation is that of separat- the seeds from the stems, a process termed ppling," which is effected by drawing the ds of the sheaves through a stout ripple, or b, firmly fixed on the centre of a bench or , which allows of two persons to work at same time. This is best performed when flax is fresh from the field, but when the w is dry and rigid by keeping, the seed-bolls best separated by a "beater," which pre- ts the fibre from being broken and injured, n used with care.

arious processes have been adopted for re- ng the straw to prepared fibre, but they may e classed under two heads; the *mechanical*, hich the operations are conducted in a *dry* , and the *chemical*, in which moisture and perature are more or less necessary. In the the object is obtained by the different parts g mechanically separated from each other out any changes being effected; in the lat- he plant itself is disintegrated, either by action of fermentation, which destroys, or me solvent, which merely abstracts the ce- ing matter by which the several parts of traw are held together. The dry or me- cal method can only be applied with advan- in case of inferior straw, and for coarse not requiring to be bleached, as canvas, rick covers, rope-yarns, &c. The *chemical* or wet process "is effected in three different ways, in each a different principle is involved. The *first* is that where the separation is effected by simple fermentation, known as "steeping;" the *second*, where it is due to the abstraction of the nitrogenized extractive compound by the agency of chemical solvents; the *third*, where simply water, either heated or in the shape of steam, is made use of for the same purpose." In the first, which is the oldest and still the most prevalent system, a destructive fermenta- tion is carried on, either slowly or rapidly, ac cording to the temperature of the water in which it is steeped, at the expense of the extractive matter of the plant, and offensive and noxious gases are generated; in the second, this matter is removed by the aid of chemical ingredients, which are costly, and never altogether efficient in their action; while, by the third, the separa- tion may be effected without any chemical changes taking place in the composition of the plant, and all its several parts be left in an available condition.

The following description of the modes of preparing flax for manufacturing purposes as practised in the British Islands is taken from a Report of Mr. A. Kirkwood, who was deputed by the Canadian Government in 1854 to visit Europe with a view of ascertaining the mos approved methods of growing and preparing this invaluable plant. Some subsequent im provements in matters of detail have been made, but it is believed that the leading principles, remain substantially the same:—

Flax-straw with the seed on is purchased from the farmer at a fixed rate per ton; it is sometimes *sold out of stock, but it is better if it* has been stacked for a short time, as there is less risk of heating when built in large stacks, and also less loss by drying. Some large concerns have lost from the last item alone as much as £300 per annum.

Each farmer's straw is kept separate from others in its different stages, viz:—Stacking, seeding, steeping, drying, and scutching. By this means its loss by seeding, and the yield of fibre can be more readily determined, affording to the purchaser a criterion for his guidance in future years.

Round stacks with ventilators in the centre are preferred, the whole resting on cast metal pillars (Fig. 1) with inverted dish-shaped caps of the same material. These prevent injury being done to the straw, by rats or mice.

All extensive factories of the kind under consideration have rail-roads for trucks radiating from them in different directions. Among these one to the stack yard, with a view to the easy and rapid carriage of the straw to the seeding-house.

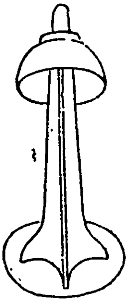


Fig. 1.

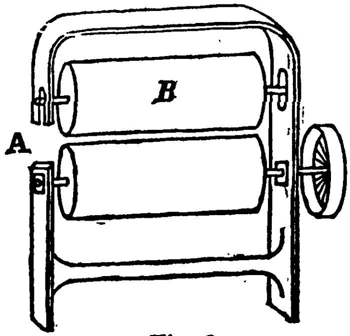


Fig. 2.

It is again weighed and the loss in stack a
certained. The seed is taken off by mean
cast iron rollers, (Fig. 2) making twelve revol
tions per minute. They are solid, ninete
inches in length and twelve in diameter. A
handful of straw is taken by the operator
the seed end passed between the rollers at A
the root end being firmly held by the hand.
This is repeated three or four times, and the bo
are sufficiently crushed. The roller B, is fr
to move upwards.

A different apparatus for seeding has been
scribed on a previous page.

Seeding in winter is a constant operation.
The greater the quantity sold to farmers for s
ing the greater is the profit, as the price
crushing purposes is less.

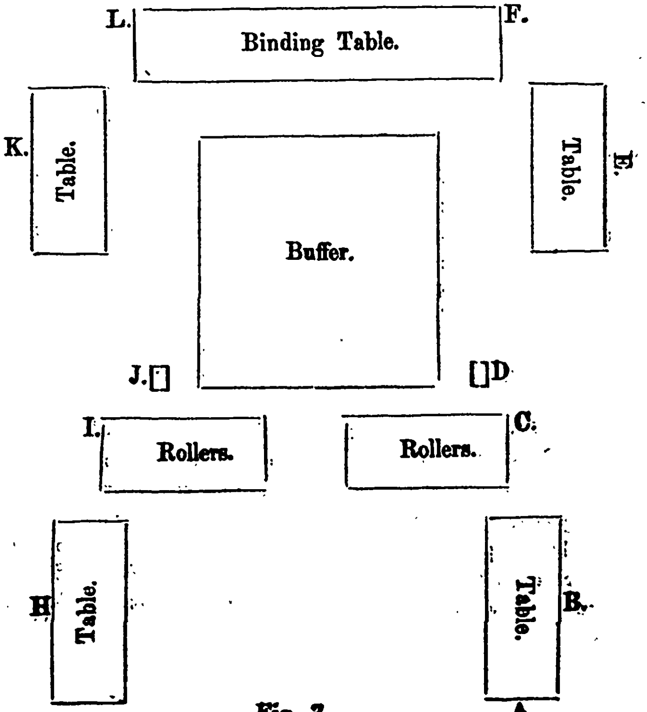


Fig. 3.

n factories working twelve vats, two sets of ling rollers will be required. A ground plan rranging these and their accompaniments s resented by Fig. 3.

little girl, A, opens the bundles of straw, es them to B, who divides them and gives n to the seeder C. She places them on the re table from which they are taken by D, se duty it is to pass the seed end through buffing machine to separate the chaff.

his is a covered cylinder, three feet in diam , and five feet in len th, making one hundred thirty revolutions per minute. On its cir-ference are six rows of wooden teeth, each ve inches long, and distant from each other a-half inches at base.

, either straightens the root end by hand, or puts a loose bundle in the machine for the purpose. from which it is taken by F, and bound.

The same routine is performed on the opposite side.

If more straw is seeded than is required for steeping, it is re-stacked.

Six tons of straw with the seed on may be done by two sets of rollers per day, at a cost of two shillings and ten pence per ton.

All the seed, chaff, and uncrushed bolls that come from the seeding rollers are passed through a machine, (Fig. 4,) having two seives. The wires in seive A, are about $\frac{5}{16}$ of an inch apart, those in seive C, $\frac{1}{16}$ of an inch.

The flax-seed, chaff, and sand fall through it, upon the shuffle-board B, which delivers them to

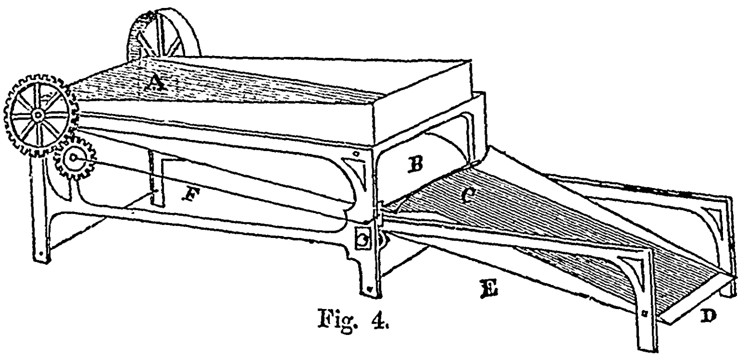


Fig. 4.

rough which all the seed and fine dust fall . The chaff passes over to the floor at F. m gives motion to it, causing it to rise and ith a jerk. A horizontal motion is given by the crank-rod F, worked by the pinion C has a motion similar to A.

uncrushed bolls separated by the seive A, are either crushed, or sold to farmers for feeding purposes at one shilling and two pence per bushel. The chaff is worth from two pence to four pence per bushel.

An arrangement is made at E, (Fig. 4,) by hich elevators raise the seed to the hopper A, (Fig. 5.)

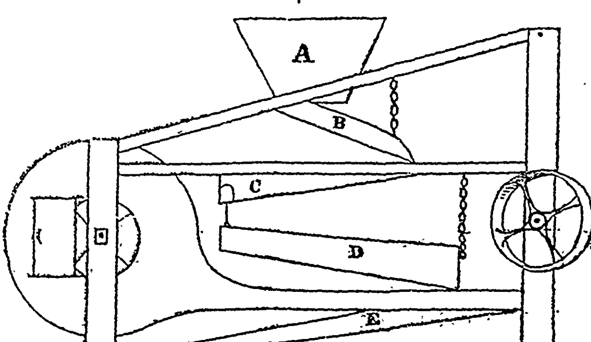


Fig. 5.

is side view of the fanners are represent shuffle-boards (B, D,) having a horizontal motion from cranks, and two seives (C, E) moved by cams. The seive C is made of par l lel wires, and E of perforated zinc. The blast from the fanners passes at F as the seed drops from D to E.

The seed is bagged at G, or spread on the floor.

The average yield of clean seed from a ton of unthrashed straw is about five bushels, of chaff, eighteen, and of bolls, three bushels.

Other machinery for the same purposes as those here treated, may be found in operation.

Steeping is the next step, or it may be that some prefer steaming. Up to this point the processes are common to both systems, but now the similarity ceases.

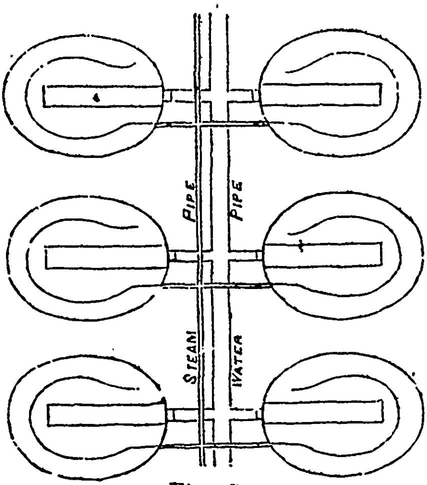


Fig. 6.

I will notice here, the method of Schenck.—Fig. 6 is a ground plan of six vats, showing also, the steam-pipe and water-pipe. Water is admitted by this pipe from a reservoir or tank on a higher level than the surface of the vats. This is heated by steam, to any required temperature.

Vats (Fig. 7,) are generally made of 2½ inch plank, 6 ft. 8 in. in depth, 9 ft. 6 in. in transverse diameter, and 13 ft. 6 in. in longitudinal diameter. They have false bottoms covering the steam coil: and covers represented as put together by Fig. 8.

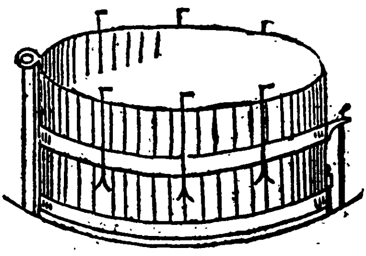


Fig. 7.

To fill a vat, three or four beets of flax are placed on their side, in one end. A row beets is then put across the vat in the dire of its shorter diameter, and resting on th root ends, in a somewhat inclining position. Another row, but inverted, is placed ag this, and so on till the opposite end of the is reached. The division floor is then put and a like quantity of flax-straw placed on The cover is then firmly secured in its place.

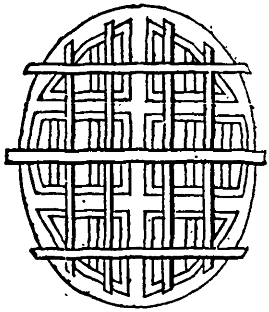


Fig. 8.

We have seen that water can be admit any required temperature. That at pr most desirable, is 90 degrees Fah.

A		○		267	
Apl.	6	9	12	3	6
15					90
16	90	90	89	89	89
17	90	90	89	89	89
18	88	88	88	87	87

Fig. 9.

That the minute attention paid in som lishments, to this particular part of the may be seen, I give a form of board (Fig. 9,) one of which is placed oppo vat.

A, tells where the flax was grown: ber 267 indicates the number of times vidual vat has been filled since the beg of the year; 15, &c., in the margin days of the month, and the figures the temperatures, which are taken every three hours, as at 6, 9, 12 o'clock, We will suppose that water at 90 degress has overed the straw in the vat, and that the suply has been checked. Fermentation ensues, and arbonic gas begins to be evolved four hours fterwards. The flax stems-well, and water is orced into the overflow pipe. A white froth and scum now appear on the surface, and gather as the evolution of gas increases. The water is changed in color and taste. Hydrogen must also escape, as the application of a light ignites the whole surface of the water in the vat.

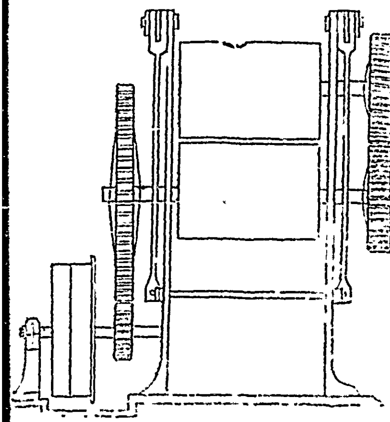


Fig. 10.

Sufficient water at 90 degrees is now admitted, to cause an overflow, which removes impurities, and leaves the flax in a fairer condition.

If the temperature falls too low, steam is easily let on to raise it to the required temperature.

Before the introduction of wet rolling, flax-straw was steeped for sixty and seventy hours. This improvement, with judicious management, has reduced the time to forty.

When fermentation has proceeded far enough, the vats are emptied, and the straw is immediately rolled. Before being caught by the rollers (Fig. 10) jets of pure water from a pipe above the feed table, fall upon it with a cleansing effect.

After passing the first pair, it is taken by a second, and a third, between which it may be turned. Much of the epedermis is thus removed, thereby facilitating the subsequent processes of drying and scutching.

A system of levers is applied to each pair of rollers, which may be understood by a reference to Fig. 11.

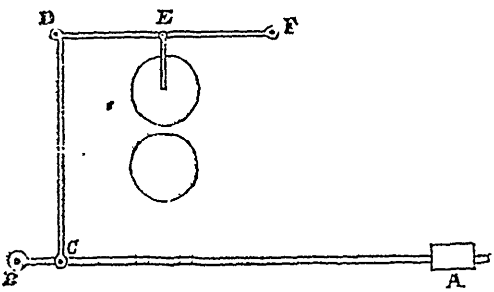


Fig. 11.

he weight A, equals 124 lbs. Its distance the prop B, is 43 in. and the distance of power C, from the prop is 3 in., therefore 43= 1777 lbs., the power. Calling this er the weight in the upper lever, its distance the prop F equals 17 in., and the distance e power E, from the prop is 9 in., therefore = 3356 lbs., the pressure on the flax as ses through each pair of rollers.

ll kinds of flax will not bear the same nt of pressure. This however, is easily ated by moving the weight A, nearer the r C.

the flax leaves the rollers it may be treat- different ways which are described in order.

The first is field drying, which is by far the best, if sudden changes of weather were not to be encountered. Even with this drawback it must not be overlooked.

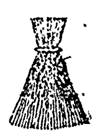


Fig. 12.

A woman puts a band round the top of a bundle of Flax after it leaves the rollers; these are laid on a track, and carried by rail to the field. They are dexterously set on end in a sugar-loaf form (Fig. 12) and known as rickles. In some retteries, the bands are taken off, and the ends opened. When perfectly dry, they are bound and put in stacks.

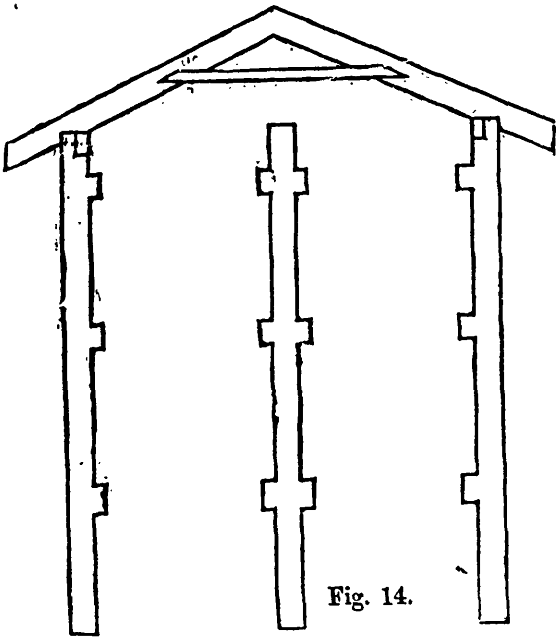


Fig. 14.

But Flax may be put in holders as it come from the rollers, and dried in sheds in the field, or by hot air in the drying-house.

Holders are made of two pieces of wood of various lengths, on the end of one of which are two rings of wire, which, when drawn over the ends of the other, hold the Flax even- ly spread.

An end view of a drying shed is represent- by Fig. 13, in which there are two rows with three tiers in each.

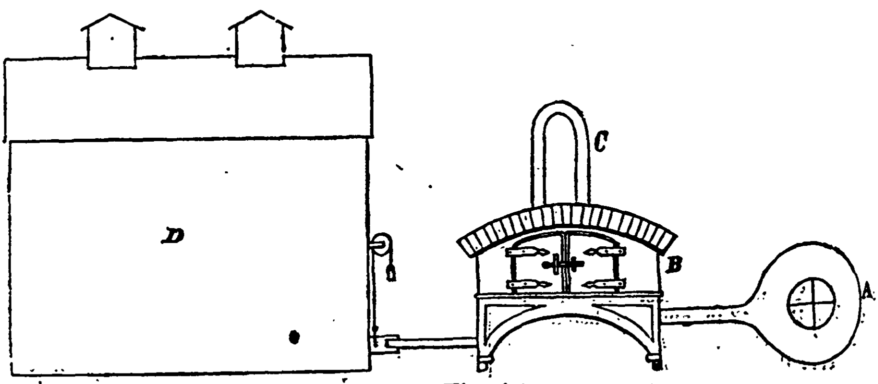


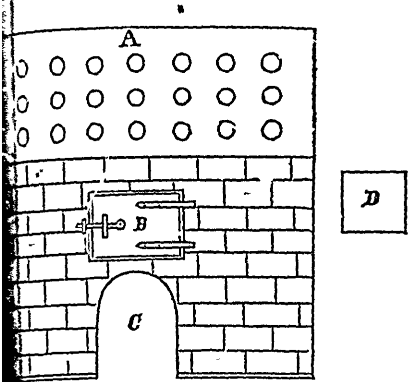
Fig. 14.

The next method of drying is by stove, in what are sometimes termed desiccating houses. These can be at work at all times, thereby enabling the manufacturer to control his own operations. But it has been observed that Flax thus dried is somewhat deteriorated in quality.

Two methods of hot air drying are in use, each of which merits a separate notice.

In Figure 14, A represents fanners which drive cold air, through a range of pipes (C), one of which is here shown. The flame fr- the fire in B passes among these pipes, brin- them to a red heat. The air, in its pa- through these, is necessarily warmed, and e- the drying house (D) at a temperature of - degrees. Here flax is dried in from eigh- twenty-four hours. Much fuel is used by - method.

he stove represented by Fig. 15; consists of nty-one pipes arranged horizontally in three s of seven each. They are six feet in length, underneath,, but separated from them by bricks, is a fire of coke. The arrows, Fig. 16, show the course of the flame.



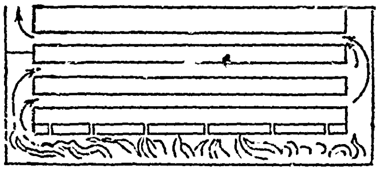


Fig. 16.

Fig. 15.

Fig. 15, A shows the ends of the tubes, fire, C, the ash-pit, and D, the cold-air The air admitted by this flue circulates the pipes, is heated there, and escapes gh an aperture above them into an iron chamber on the floor of the drying house, which it now fills.

Drying-houses generally admit three tiers of Flax in height, and six rows in width. Rows of studs are set up, reaching from floor to ceiling.

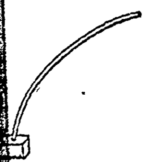
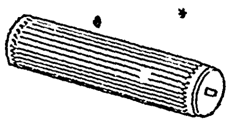
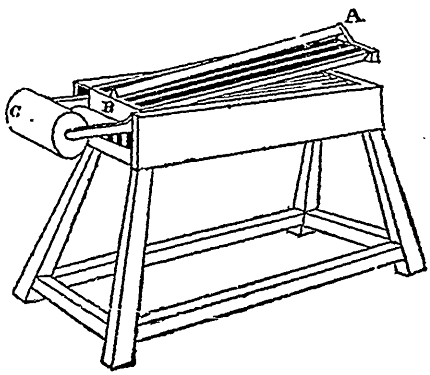
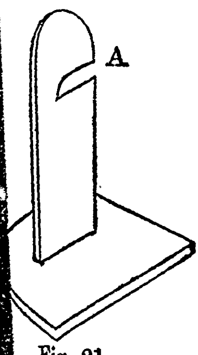


Fig. 17.



18.





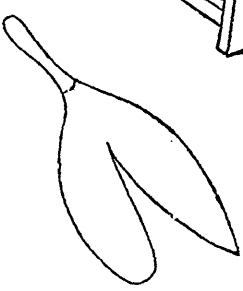


Fig. 20.

Fig. 21,

Horizontal bars are nailed to these in a longitudal direction, on which the holders are suspended. The apartments are air-tight above. The only means of escape for the air as it becomes charged with moisture, being by descent to apertures in the floor leading to shafts, and up these to ventilators in the roof.

All Flax, after drying, improves by stacking. Technically speaking, it *comes*. Temporary sheds answer every purpose, if the roofs are water-tight.

The next operation, in order, is scutching.—The straw, in its passage to the scutching-room, is again weighed, and the loss by steeping and drying ascertained.

Before scutching, it is usual to pass the Flax-straw through a breaking machine. Since the introduction of wet-rolling, and scutching machines, this has been partially discontinued.

The simplest form of break is of a mallet shape, (Fig. 17) and is much used in Belgium.—The Flax is broken by successive blows from its serrated surface.

Another form of hand-break is represented by Fig. 18. which consists mainly of two sparred frames, the upper movable on an axis at B, and the lower fixed. It is so constructed that the bars in the lower frame fit between those of the upper. The operator takes hold of the implement by the left hand at A, and with the right places some flax over the lower frame; the upper frame is then lowered, thereby breaking the woody portion of the stems. The flax is successively brought forward and broken until ready for hand scutching.

Breaking in retteries is better done by machinery than by hand. Fluted rollers of wood or metal are mostly used. One of these is represented by Fig. 19. Four or five pair of these work in a machine, one above another in each pair. The flax is fed from a table, and caught between the first pair, then by the second, third, fourth, and so on in succession.

These rollers are seven inches in diameter.—The teeth of the two first pair project an inch, and are severally one and a quarter, and one inch distant from breaking edge. Those of the three last pair project a little more than half an inch and are three fourths of an inch apart.

The first pair revolves a little slower than the second, the second than the third, and so on. Pressure is given and regulated by weight.

Hand scutching of flax is still a very com- practice; but it is tedious and expensive ca whole. The simplest apparatus for the pur is represented by Figs. 20, and 21. The fo is the flat blade or sword, with its bala point, and the latter is the stock, in a sl which A, a handful of flax, is held by the hand of the operator, and struck by the scut in his right. New surfaces of the flax are sented to the blade, till all the wood is be out, and it is perfectly clean.

After flax is broken it is stricked, that is, into stricks for the scutchers. A strick i much flax as one hand can grasp, evenly ar ed, and slightly twisted. One girl stricks two scutchers.

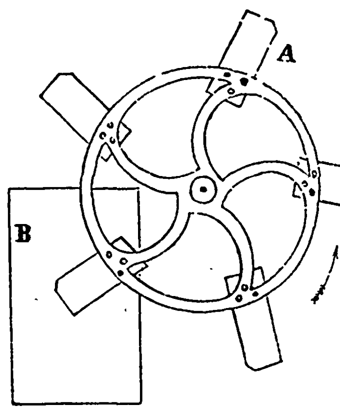


Fig. 22.

In mill scutching several wheels are fix a shaft distant from each other three more. It will be seen by Fig. 22, that sca blades of wood or metal, are screwed t periphery of these wheels. Upright pie metal (B) called stocks, are so placed, th blades as they revolve pass near their sur The tops of these stands are sometimes level with the shaft, and sometimes hig The blades are $\frac{4}{8}$ inch, and $\frac{1}{8}$ inch from th striking point, and $\frac{4}{8}$ and $\frac{1}{8}$ at heel. T are three feet six inches in diameter.

A boy supplies each scutcher with weighs each bundle before delivering it, ters the quantity against his name. Th simple form of entry.

Name.	Straw.	Flax.	Yield per cent.

Fig. 23.

The quantity of scutched flax done by each orkman per day is weighed, the percentage of bre from the straw calculated, and the compar-ive merits of the several scutchers ascertained. cutching-wheels make from two hundred to ro hundred and fifty revolutions per minute.—hey are covered in to prevent dust and cidents.

It was before noted that scutching machines :now made which do away with skilled labour.

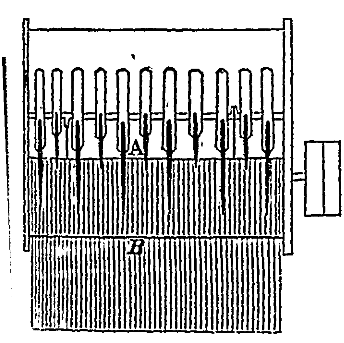


Fig. 24.

.large per centage of codilla, or more com-ily, tow, is made in scutching. Different hods are in use to effect the separation of the shove or woody stem. Tow machines are a substitute for hand-picking. Fig. 24 gives a front view of one of these. The wooden arms A, which project in front, are alternately raised and depressed by cranks on their respective axles, connected by rods with others on the driving shaft below

The alternate striking of the tow by these arms has the effect of separating the shoves which fall through the wires B. These shoves are commonly burned and the ashes used as manure.

Tow, like flax, varies much in quality. There are A 1, A 2, B, C tow, &c. A 1 comes from the sorters', A 2 from the scutchers' bags; B and C are the codilla from the machine.

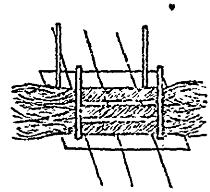


Fig. 25.

Flax is taken from the scutchers to the sort-ing-room. Here it is sorted into first, second, and third qualities, each determined by the judgment of the workman. It is commonly made up in bundles or stones of fourteen pounds each. One method is represented by Fig. 25, in which the sorter lays the stricks lengthwise over three bands, with which the bundle is tied when finished.

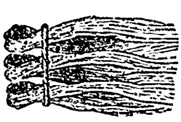


Fig 26.

By another method a twist is given to the strick. It is then doubled at the centre and the two ends brought together as in Fig. 26. A band is then passed round their twisted ends, making them ready for bagging. Two hundred weight are put in each bale, or sixteen stones of fourteen pounds each. The flax is now ready for market.

A store room for flax is no unimportant part of a flax factory. If flax is kept too dry it loses in weight and quality. It should be close ly packed together in a dark and damp apart ment.

Flax has now been brought to that state in which it is purchased by the spinner. But before saying anything of spinning, a description of Watt's chamber for steaming will serve to complete the routine of flax preparation.

It has been before observed that the only point of difference at the present day between the system of Schenck and that of Watt is, that in the former, fermentation at a high temperature is its main feature, while in the latter, the chief characteristic is maceration without fermentation. To Watt, however, is due the extensive introduction of wet-rolling.

A chamber, of which Fig. 27 is a section, may be described as a hollow, air-tight vessel, made of cast iron plates. It is about twelve feet in

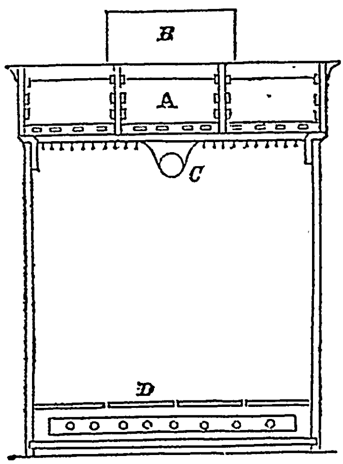


Fig. 27.

length, six feet in width, and six feet in de[pth] including the space between the false and true b[ot]tom, which is about nine inches in depth; but n[ot] including the condensing cistern, (A,) on the t[op] of the chamber, which is sixteen inches.

The hot water cistern, (B,) set in the cond[ens]ing cistern is three feet square. A tube, (C) in the interior of the chamber and run[ning] lengthwise is connected with it, by which t[he] chamber is two thirds filled with liquor imm[edi]ately before steam is admitted.

In the interior of the chamber we find t[he] steam-pipe between the false and true bott[om] pierced with holes to allow the escape of ste[am]. Above the steam-pipe is the false bottom (D) consisting of perforated plates, supported by rame work on feet; also a bar connecting t[he] two sides of the chamber to prevent their e[x]pansion or collapse.

On the outside of the chamber are found air-valve, for the admission of air when ste[am] shut off, two cocks to indicate the quantity water in the chamber; and two doors, o[ne] each end opening outwards, each 2 feet 5 in[ch] square. These are used for filling and empty[ing] and are screwed up and made steam tight by gaskin of tow. There is also a pipe for a[dmit]ting steam to the chamber, exhaust steam fr[om] the engine is used,) and another for the es[cape] of the steep liquor. Surplus steam escapes a safety valve on top.

When flax is ready to be taken out of t[he] chamber, the steep liquor is drawn off into underground cistern, and there mixed with overflow from the condensing cistern wi[th] view to its future use in other chambers. same regard is not had in practice for a cond[ens]ing surface on top of the chamber as the ... of Watt's system exhibits.

The test by which flax is known to be s[uffici]ently steamed, is the easy separation of the [epi]dermis between the finger and finger and th[umb]. All subsequent operations in this system, a[s rol]ling, drying, scutching &c., resemble those ready described, and require no separate not[ice].

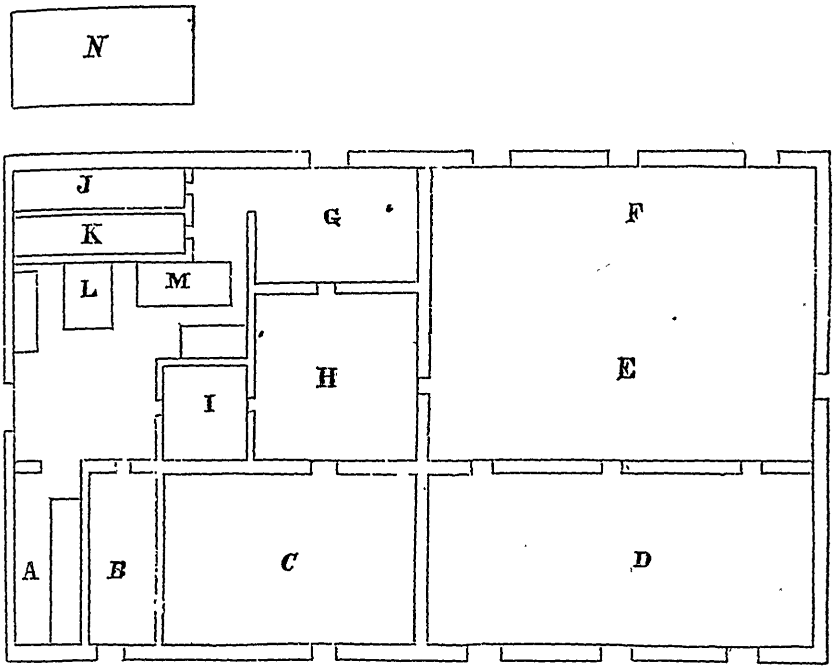
Figure 28 represents a ground plan of a F[lax] Factory on the system of Schenck. A is boiler-house; B, the engine room; C, the se[ed] mill; D, the seeding house; E, the ste[ep] house for the vats; F, the wet-rolling ho[use] both of which are under the same roof is the tow-room; H may be used as a s[...] house; I is a workshop; J and K are d[ry] houses; N is the reservoir which supplies establishment with water, among other th[ings] the tank L, in which water may be heated steam for the vats; and M is the store.

Grounds for a stack-yard and drying fie[lds] usually attached to a rettery of this descrip[tion].

Flax passes from the rettery to the sto[re] the spinning-mill, from which it is selected roughed. The finer qualities are taken t[o] flax-breaker, where the ends are cut off. T[hey] are called cut-line, and are spun to low nu[mbers]

The remainder is called long-middles. The object of cutting is to remove all scabs and impurities which generally exist in the ends of Flax. After cutting, it is hackled by machinery and taken to the sorting department, where it is selected for different numbers, either for warps or wefts accerding to the judgment of the operator.

The tow from the hackling machines is carded and spun to 40 s. and 50 s., for coarse fabrics, as towels, sheetings, &c. It is called first, second and third machine tow.



[Scale 40 feet to the inch.

Fig. 28.

lax, after dressing, is taken to the spread rd, where the cut-line is spread in four slivers. se are seized in the retaining rollers, and afards caught on the reach by the gill. The h is the distance from the retaining to the vering roller. This varies according to the lity of Flax worked. The delivering roller es from twenty to thirty revolutions for one the retaining, thereby drawing the sliver nty or thirty times.

our slivers are united into one, and receiving can holding a certain quantity, which is anced by the ringing of a bell, when the can offed. The cans so doffed are put up for a nd drawing behind another frame, pass over each as before, are drawn twelve times, and ve slivers united into one or two. We have 12 x 20 = 240.

ese slivers are taken to the third drawing e, where the same process is repeated, that gai drawn out twelve times, therefore 24n= 2880, which is the number of times original sliver has been extended.

ee cans are now set behind the roving frame, where the sliver passes over the reach, and i delivered on a bobbin, receiving a twist from the flyer.

Bobbins from the roving frame are taken to the spinning frame. Here they pass through troughs in which water is heated from 100 degrees to 150 degrees by steam, thence to fluted rollers, the reach of which is longer or shorter as the sort spun is finer or coarser.

Finer numbers receive more twists than coarser.

Yarns pass from the spinning to the reeling room. Reels are 90 inches in circumference; each contains 20 hanks, each hank 12 cuts, and each cut 300 yards.

These yarns are taken to the drying loft, and subjected to a high temperature, and when dried made up into bunches for market. Here I will leave them, merely remarking that they are now ready to appear as a textile fabric; assuming the appearance of ordinary linen, or a damask table cloth. In either case before showing themselves in the warehouse of the merchant, they must undergo the operation of bleaching, which itself supports large manufactories.

Flax Culture.

In a late number of the Toronto *Globe*, we find another letter from Mr. Donaldson on this *subject, which contains some additional information* to that embodied in former letters. Mr. Donaldson says :—

Canada should turn her attention at once to this subject, and embrace the opportunity of growing every acre the farmer can put in, as it is in contemplation, with several capitalists here, to put up machinery in Canada, the moment there is sufficient flax grown in the country to warrant them in this undertaking. Now that the Spring is at hand, and the Scutching Mills are already on your shores, ordered by the Canadian Government, parties wishing to try them *should make application, without loss of time*, to the head of the Bureau of Agriculture, Quebec—the machines having no doubt, reached Toronto before this. The cost of cultivation should not deter the Canadian farmer from making the trial of a few acres, as there is not an acre of flax raised in Ireland that does not cost from six to seven pounds sterling—including seed, rent, taxes and labour—before it is ready for our market, and farmers this season, where they have been at all fortunate in getting a fair crop, realized from £80 to £90 a ton, and many of them a great deal more. The quantity of seed sown to the acre should not be less than 2 bush. of 56 lbs., as it is an advantage to have it thick enough to have the fibre evenly and of the same grist. If farmers are not convenient to a mill, they can put the straw in the barns, sheds, or stack it up, after it has been grassed, and the longer it is kept in this state the better the fibre becomes. It is highly recommendable to farmers in the western part of the Province, where more flax growers are than any other place, to endeavour to pull a portion of it before the seed is ripe, as in this state most of the flax that brings the best prices is harvested. The ground should be in good tilth, after having it well ploughed and harrowed, and above all things clear of weeds, then it should be rolled, then the seed sown, then harrowed with a light seed harrow, again, and lastly rolled. Often farmers here sow their clover and grass with flax, as they find in pulling, the flax helps to mould the young clover plant, and seldom, if ever, you will see patches missed, which is often the case with either barley or oats. Farmers in the country who have not much experience in the culture of flax, should go to Norval, Township of Esquesing, or to Canestoga, county of Waterloo, and they will see for themselves the process carried on, both in the cultivation and preparation for the market, by the milling and manufacturing carried on at both these places; and in the place of being able to realize $15 to $16 an acre in growing fall wheat, and less at the present pri[ce] of other spring grains, they will get from $30 [to] $40 clear out of flax, and twice that when th[ey] come to understand the steeping and handl[ing] thoroughly, as they do in Germany, Belgiu[m,] Switzerland, or any flax growing country.

Hoping to hear of a flax association being formed immediately in Canada.

I am, dear Sir,

Your obedient servant,

J. A. Donaldson,

Canadian Government Emigration Agent

Belfast, March 6, 1852.

The Flax Scutching Machines.

The Flax Scutching machines imported [by] order of the *Canadian Government, from I[re]land*, of which a cut and description are gi[ven] at page 99 of this volume, have arrived, and [are] at the date of writing, at Toronto. Of the machines imoprted. three are to be placed [in] Lower Canada, and three in Upper Canada. [Of] these, one is presented to the Board of A[gri]culture in each section of the Province; to [be] used under their direction and control. Of [the] two remaining mills for Upper Canada, one is [for] the present to be placed at London, and one [at] Kingston.

The Composition &c. of Milk.

[We have much pleasure in presenting to [our] readers the subjoined lecture on Milk, deli[vered] by Professor Voelcker, the Chemist to the [Roy]al Agricultural Society of England, at a we[ekly] meeting of the council, held in March 12th. Eds.]

COMPOSITION OF MILK GENERALLY.

Milk is essentially an emulsion of fatty p[arti]cles in solution of *caseine*, or curd, and [milk] sugar. The fatty matter of milk, howe[ver, is] not contained in it in a free condition, but [en]closed in a little cell, consisting of the identical substance which, in a state of solu[tion] exists in milk, and which is participated [when] milk gets sour. In other words the butt[er], the fatty portion of the milk, is encased in [...] I have here some milk globules, and they [are of] different sizes in different species of animals, even in animals of the same kind they vary [from] the 1-2000th to the 1-4000th part of an [inch.] They are generally round, but sometimes slightly egg-shaped. The yellow spots [repre]sent some of the epithelium cells which are [gen]erally found in minute quantities even in [...]

k. In addition to the substances just men-ed, milk invariably contains a certain por-of mineral water, and it is important to ce that this mineral matter consists es-tially of the same materials of which the mbustible part of bone is composed. The of milk is rich in phosphate of lime and phate of magnesia, or bone earth. Butter, l, milk-sugar, and mineral substances are the pal constituents of milk. In diseased milk, find a number of accidental matters which not be identified by any chemical test, but be well indentified by means of the micros-e. In diseased milk, pus, or common matter, erally manifests itself under the microscope, even the microscope is not sufficient in all s to prove whether the milk is wholesome ot, or whether it is conducive to the health imals or the reverse. In many instances constituents of food, or any substances ch have a decidedly medicinal effect; pass ra-into the milk, and confer the medi-l properties upon the milk which the reme-themselves possess. Thus, if an animal castor oil in considerable quantities, the ative effects of the oil pass into the milk. ouring matter, the red colour of madder, and blue colour in indigo, the common weed *curialis amma* and *polygonium aviculare*, wise pass into the milk and colour it. re are also, no doubt, smelling substances h rapidly pass into and give a peculiar taste flavour to the milk, and when these pe-r flavouring substances are largely infused affect the milk. Thus we know that the ip flavour, for example, is readily imparted e milk. Milk appears white on account of uspended milk globules. In the measure in h those globules separate in the shape of , and milk becomes clearer, and acquires culiar blueish tint, which is a very good in-ion of the character of the milk. The less parent it is the better; the more opaque it e more butter it contains. And allow me to notice that the quality of the milk is more regulated by the amount of butter of cheesy matter. An extensive series of ses which I have made of milk have ght out this fact, that whilst the proportion seine varies but in a trifling degree, the nt of butter or fatty matter in milk is sub-to very great varieties indeed. If you a glance at the tables on the wall, you orm an idea for yourselves of the great tions that exist in the amount of butter a given quantity of milk is capable of ing. Thus, in the first sample of milk you no less than 7½ per cent of butter, in the d 5 per cent, in the third 3½ per cent., and fourth only 2 per cent. I have separated analyses from a number which I made time ago, and I have further increased by analysing, from month to month, dur-e past season, the morning and evening milk of our dairy cows, and greater variations than those given here I have not found. These four examples, therefore, may be safely taken as indicating the wide range of the variations which exist between the different constituents of milk; the specimen of milk which is exceedingly rich in butter is derived from a sample from the diary of Mr. Harrison, at Foster Court. The second sample indicates a richer butter than usual. The third fairly represents the composition of milk of a-verage good quality. And the fourth that of milk of a poor quality. But they are all four genuine milks. They are not in any way reduc-ed abnormally; and I ascribe the great richness of the first sample to the extreme good pasture upon which the cows had been fed, at a season of the year when generally, milk becomes richer in quality, but less in quantity. In the months of September and October, and up to November, the quality of the milk very greatly improves, but the quantity recedes and becomes smaller. Whilst, however, this is true generally, it is not so always; for if the animals are stinted in food, they yield not only little milk, but also a poorer milk, and that at a period of the year when they should, and generally do, produce a richer milk. Speaking generally, milk is richer in the fall, and poorer in the spring of the year. But other circumstances may influence the character of the milk so as to produce different results. I shall have to speak presently more in detail of the various circumstances by which the quality of the milk is modified; but before doing so, I will point out the great difference in the com-position of the milk of different animals.

COMPOSITION OF MILK OF DIFFERENT ANIMALS.

And first let me direct your attention to the composition of the milk of herbivorous animals —the cow, the ass, the goat, the ewe; and then the milk of carnivous animals—the canine race, taken as an example of the suspension of milk. You will notice that the milk of carnivorous animals is very much richer in all its various constituents, more especially in *caseine*, or curd, and also in butter. It is an extremely rich milk and we have no food to compare with it. Solid butcher's meat contains less real food and more water than this description of milk. This will explain at once the extreme difficulty we experi-ence in bringing up a puppy dog by hand. The fact is, that you have no food rich enough for that purpose. Perhaps the only food available, if you had to rear a valuable puppy by hand, would be a highly concentrated beef tea; that is an infusion of beef highly concentrated. No solid food or pure flesh is sufficiently concentra-ted to provide for the nourishment of a young dog. It is not only the amount of curd, but also the amount of butter, which is extremely rich. There is another peculiarity also. It is this: that the milk of carnivorous animals con-tains no milk-sugar at all. Milk-sugar, however, is very abundant in the milk of other than carni vorous animals; and curiously enough, it makes its appearance in the milk even of carnivorous animals when, by domestication, they are gradually accustomed to a bread diet. If you feed a dog with bread, the milk increases, and will contain some milk-sugar, and that quantity increases with the amount of bread and the starchy food with which you supply the dog. This shows the intimate connection which subsists between the character of the food and the composition of the milk of animals Contrasted with the milk of carnivorous animals, the milk of the ass appears most inferior, and an extremely poor milk. But whilst it contains, as indicated in the analysis, 91½ per cent. of water, little *caseine*, scarcely any butter, and a very small quantity of ash, it is comparatively speaking rich in milk-sugar. Now, milk-sugar is a very digestible material. It is easily digested. Indeed, on the continent it is used as medicine in cases of indigestion. It is a household medicine for children. Children suffering from indigestion have administered to them a teaspoonful or two of this milk-sugar or *lactine*, as it is also called; and as an aperient medicine, I do not know another so wholesome. For invalids, therefore, ass's milk is, no doubt used in this respect—that it is an easily digested food. Persons suffering from indigestion are frequently unable to well assimilate the butter which is contained in good rich milk, and ass's milk, for this reason, is peculiarly well adapted to them. I question much, however, whether the composition of the milk of all donkeys is so poor as this. I ought to mention that my analysis is made of the milk of a German donkey, which, like Irish donkeys, is fed on the road side, not upon the richest of food. In short, it eats what it can pick up; but I believe that a well-fed donkey would furnish a much richer milk. I am led to this belief from having seen, by investigations, which I hope to publish in future number of the Royal Agricultural Society's Journal, on the variations in the composition of milk, what an important influence the amount and quality of food have upon the composition of milk. For a moment or two, allow me now to point out a few particulars with respect to the milk of ewes. I have here the composition of two samples of ewe's milk. Both were analysed by myself recently; one a fortnight ago, and the other was completed only the day before yesterday. The first sample of ewe's milk I had the pleasure of analysing for his Grace the Duke of Richmond, who had experienced a great many losses in his flock of sheep. Many lambs had died, and his grace thought it probable that the milk of the ewes was of a poor character, or contained something that was injurious. I put it under the microscope, and subjected it to a careful examination; but I found it perfectly normal. No pus, or other matter, which occasionally occurs in diseased milk, was present; and on comparing the analysis with the published analyses of ewe's milk, I found it agreeing as nearly as [illegible] could expect in two samples of milk. The [illegible] lished analyses of ewe's milk made it closely [illegible] semble goat's milk, for this reason; but on [illegible] alysing the milk from our own ewe pen I [illegible] struck with the very great difference in quality. You will observe that in the first [illegible] ple of milk, which is from the ewe pen of [illegible] College Farm, we have no less than 30 per ce[illegible] in round numbers, of solid matter; whereas the second sample we have only 16 per c[illegible] There is thus, in the one sample of milk, ne[illegible] double the quantity of solid food that is in [illegible] other. I have not learned what time had ela[illegible] from the ewes having lambed; but the [illegible] analysed by me from our own ewe pen is d[illegible] ed from ewes that had lambed only three [illegible] previously. Now, the time at which the la[illegible] had dropped has unquestionably great influ[illegible] upon the quality of the milk. We know [illegible] the very first milk which is yielded by the [illegible] after the lamb is dropped is more like cr[illegible] than butter. The sample I have before [illegible] not the very first milk: it is milk that was se[illegible] ed two or three days after. I gathered it f[illegible] a number of ewes, and all had lambed within [illegible] period; but I was not prepared to find so [illegible] a variation. It is an important subject to [illegible] certain what are the variations in the mi[illegible] the ewe at different times. But we have [illegible] data for making that comparison; and alth[illegible] I have made a report to his Grace the Du[illegible] Richmond, that the milk of the ewes w[illegible] good quality when compared with other sa[illegible] of ewe's milk—analyses, however, which [illegible] not made in England, but on the Contine[illegible] is very possible that a poorer milk is prod[illegible] and after all that this milk was of an in[illegible] character and of poorer condition. At any [illegible] it is interesting to notice the high state of [illegible] centration of the milk that is yielded by e[illegible] the first week, or even three days after la[illegible] It is an extremely difficult thing to bring [illegible] lamb when its mother dies within the first t[illegible] or four days. There is a peculiarity in the [illegible] dition of ewe's milk which throws some [illegible] upon the subject, and it shows the reason [illegible] such difficulties are experienced. I propose [illegible] to reserve a couple of ewes, and analyse [illegible] milk from time to time, in order to see i[illegible] milk gradually becomes poorer, or remains [illegible] tionary, and also with a view of ascert[illegible] what the average composition of ewe's milk [illegible]

CIRCUMSTANCES AFFECTING THE QUALITY OF [illegible]

Passing on, I would notice some of the [illegible] cumstances by which the quality of milk [illegible] fected. The distance from the time of calv[illegible] have already referred to; I may, therefore, [illegible] it over here, and refer briefly to the age [illegible] animal. It is well known that an old cow [illegible] not yield such good milk, nor so much mi[illegible] have lately seen an analysis of milk which [illegible] ite as poor a result as the one I have men-ned; it is that of milk analysed in Holland Dr. Baumhauer. He states that it is the milk a cow that had had ten calves, and nothing pears to be so unprofitable as to keep cows r so long a period. Generally speaking, as is ll known to practical men, the milk becomes her after the third or fourth calf has been opped. The climate and the season of the r affect the quality of milk in a remark-le degree. In the moist and temperate clim-es we obtain a larger quantity, though usually poorer description of milk, than in dry and rm countries. The quality of the milk is thus cted by the temperature of the air, and by amount of moisture in the atmosphere. It y perhaps, be also due to the amount of mois-re which in wet seasons is present in the pro-ce; and that the general state of health and condition of the animals have a marked in-nce upon the quality of the milk, need hardly mentioned. It is so well-known, indeed, that remark is necessary upon the subject. The e at which the milk is tak n, however, has an ct upon the quality of the milk. In most cultural treatises you will find it stated that morning milk is generally richer than the ning milk; but my results do not favour this ion. I find the following to be the case;— t of 32 samples of milk which I analysed, ing the morning and evening milk, I found t of 16 different cases, in 8 the morning milk poorer than the evening milk, in 4 the ning milk was richer than the evening ; and in the remaining 4 there was no per-tible difference between the quality of the ning and of the evening milk. I mention particularly, in order to show how careful should be not to generalise, to come to a clusion hastily. At first I took it for grant-hat the morning milk was richer; and, in-d, the first three analyses I made confirmed general impression; I need not go over the ts at present. I merely mention the gener-ect. The first three mornings' milk which alysed were, indeed, richer in milk; but on nding the series of analyses, I found after-us a larger number of instances in which the ng milk was richer than the morning; and enous times I found that both were perfect-ike. What then, is the general conclusion ould draw from such facts? I believe the time of the day had not so much to do it as the quantity and quality of the food h is given some three or four hours before ing. I have traced this most distinctly. e time I found the milk of our dairy stock poor in the evening. The cows were out on grass. They received in the g, therefore, oil-cake and rape-cake, and in the morning they produced a richer ; which shows plainly the effects of the on the morning milk. And at another n the winter—I found that when the cows were fed in the morning, and again in the middle of the day, with barley-meal and rape cake, they produced a richer evening milk. I believe, then that the quality of the milk is affected by the food, and the time at which the food is given to the cows, and that we certainly cannot say that, in a general way, the morning milk is richer than the evening milk, or that it is poorer. It may be one or the other. It may be perfectly alike, or poorer or richer, as the case may be. The race, breed, and size, of the animal have also an important influence on the quality of the milk; and that Alderneys, Chatelains, and others are noted for the rich quality of their milk is too well known to the practical men to need any comment from me.

Lord Feversham—Have you ascertained what is the difference in the *quantity* as well as quality of the morning and evening milk?

D. Voelcker—The yield was not much greater in the morning than the evening; but I was about to make an observation on that very subject. It is generally believed that the thorough-bred cows do not produce so much or so rich a quality of milk, and that the common dairy stock or cross-breeds produce more or a better description of milk; but some experiments which I have made on the subject have given me a rather undecided result—a result from which I cannot draw any satisfactory inferences. In the month of September, 1860, I selected three cows from the common dairy stock, and three pedigree short-horns. They were kept in the neighbourhood of Bristol, on the present Mr. Stratton's farm, then in the occupation of Mr. Procter. They were on good pasture land, and I carefully ascertainted the quantity of milk, and also the quality of the milk. After I had kept them some time on pasture, the milk was collected. I then gave to each set of cows 1 lb. of excellent linseed cake, and in one week's time increased the quantity to 2 lb. I then carefully analysed the milk of the commoner and of the pedigree cows; but upon looking over the results I could find no perceptible difference between the quality of the milk of the common stock and that of the thorough-bred short-horns. Thus, the common cows yield a milk which returned nearly 4 per cent. of butter, and the thorough-bred short-horns gave within two-tenths per cent, of the same quantity. The total amount of solid matter in each case was just alike. When 1 lb. of linseed cake was given them the quality of the milk was not materially improved. In both cases milk of about the same quality was produced; and the same general remark may be made with respect to the 2lb. of linseed cake which were given to the cows. In all these cases the quality of the milk was not improved, neither of the common cows nor of the pedigree cows. The quantity of milk produced by the three pedigree cows, kept on grass alone, amounted to 28 pints in the morning, and 21 pints in the evening, making together 49 pints. The common dairy stock produced rather more, being 31 pints of morning milk, and 21 pints of evening milk, in the whole 52 pints. When they received 1 lb. of cake the three pedigree cows gave in the morning 26½ pints, and and in the evening 22 pints, together 48½ pints: very nearly the same quantity as before, (A member—do you mean the three?) Yes; and the three common dairy cows produced 28½ pints in the morning, and 18 pints in the evening, making 46½ together. When 2 lb. of cake were given to them, the three pedigree cows yielded 26½ pints in the morning, and 21 in the evening, together 47½ pints; whilst the three common dairy cows produced 30 pints in the morning, and 19 in the evening, together 49 pints. It follows from this that, whilst the quality of the milk was not materially bettered, the quantity became slightly less in the case of the three ordinary cows; because we had from the three pedigree cows 49 pints of milk when kept on grass, 48½ pints when they got 1 lb. of cake, and the quantity was further reduced to 47½ pints with 2lbs. of cake; and from the three common airy cows, when fed on grass alone, we got 52 pints, with 1 lb. of cake 46½ pints, and with 2 lb. of cake 49 pints. It would appear from these facts, then, that the additional food had a tendency to go to meat, or to produce fat. This would show that we cannot increase *ad infinitum* either the quantity or the quality of the milk. Cows that have a tendency to fatten, when supplied with additional food rich in oil and in flesh forming matters like linseed cake, have the power of converting that food into fat. They do not produce a smaller quantity. It is this, then, which renders all investigations respecting the influence of food on the quantity and quality of milk so extremely difficult. Accordingly to theory, it would appear that food rich in oily or fatty matter would be extremely useful for producing a rich milk; but in practice we do not always find this to be so. Indeed we often find that very rich food has just the other effect. It produces by no means a better milk, but a smaller quantity, and fat and flesh instead of milk. Well, I repeat, these things render all investigations on the influence of food extremely perplexing. There are so many circumstances which have altogether a disturbing influence on the food in its passage through the animal system that it is difficult to trace its course, and still more difficult to predict beforehand what will come of it.

INFLUENCE OF FOOD ON MILK.

"These remarks lead me naturally to speak a little more in detail of the influence of food on the quality of the milk. I just now noticed that the quality of the food, the composition of the food, does not always indicate its adap- tion or fitness for producing a good and abundant quantity of milk. For, besides the tendency which cows that are good fatten- have to convert peculiarly rich food into f- there are some purely practical considerations be taken into account before we can decide up- the quality of the food which ought to be giv- to milking cows. It is well known that oi- matters pass rapidly into the milk. Cows th- are supplied too abundantly with linseed ca- produce milk that does not make butter. very curious instance was brought under notice some time ago, by Mr. Barthropp, Crettingham, in East Suffolk, of milk furnishi- cream that could not be made into butt- When put into the churn it beat up into fro- and could not be converted into butter; th- *caseine* would not separate, and I have been formed by Mr. Barthropp that he had given cows linseed-cake in considerable quanti- This excess of linseed-cake, and, perhaps, th- want of good dry hay, have evidently the ef- of producing too much liquid fat; and in try- to separate as well as I could the solid or cr- talised fat from the liquid fat I obtained th- proportion: one-third of solid fat, in ro- numbers, and 23 parts of liquid fat. In ch- ing the whole of it was made up into a sort froth; in fact, it could not be churned. butter remained a liquid, even at the cold per- of the year when the milk was analysed—nam- last January. I have never become acquai- with so striking a case, as *showing the influ-* of a great excess of oily food on the quality the cream and butter. In speaking of the qu- of cream, more especially the fatty portion of the butter, I would likewise take this opportu- of observing that bad oil-cake, and especially linseed cake, does a great deal more harm t- is generally supposed by the dairymen. *inferior taste of the milk of stall-fed cow-* well known; but I believe it is not so well kn- that the wholesomeness of milk is affected the abominable matters which are occasio- put into linseed cakes. At the present time, cake crushers seem to enjoy the privilege incorporating any kind of oil refuse, no m- what it is, with linseed cake; and since this been so, we hear *more frequently of di-* milk, and of milk which has a disagre- flavour. When the necessity arises for fe- cows with additional food, and linseed ca- found by practical men to be preferable to kinds of food, I would suggest that it is m- well laid out to buy the very best and cake, and not, for the sake of the lower f- get it of an *inferior quality*. The use of food, distillery wash, the acid waters of makers, and similar refuse, make the milk, well known, watery, and dispense with the sity of mixing water with the milk after. By far the most commonly adulterated walery food. Water is not so much added to milk, after it is drawn off from the animal, it is incorporated with the milk in the system fore. It is well known that food which contains lactic acid has a tendency to produce an undance of milk; and when animals are fed th concentrated food, such as bean-meal or e, it may perhaps be advisable, in the absence brewer's grains or distillery refuse—two terials which contain lactic acid—to generate ne lactic acid by keeping barley meal for some e in contact with water, and letting it slightly ment, perhaps with some vegetable refuse tter, which has a tendency to hasten the mation of lactic acid from barley meal. By ng this, I am inclined to think that concentred food, like cotton cake, bean-meal, or rapee, would be rendered more digestible, and re readily made available for the production milk of a good character. Time does not mit me to speak in detail of the influence of various kinds of food upon the quality of milk; and I purposely cut it short, in order t, if some spare time is left, those who are ctically better acquainted with the subject n I am may have an opportunity of throwing some hints, and perhaps of opening up a e discussion respecting it. What time I have my disposal I hope to fill up usefully by cting your attention to the mode of testing quality of milk.

(To be concluded in our next)

On Steam Cultivation—its rise and Progress.

very interesting paper on this subject was d at a recent meeting of the London Fars' Club, in England, by Mr James Howard, celebrated Implement Maker, of Bedford. following paragraphs give the substance of communication, which will not be devoid of est to our readers generally.—Eds.

fluence of Steam Power.—It may appear tling, but 'tis no less true, that to the disry of the steam engine, more than to any r cause, this country owes its great wealth, manufacturing greatness, and the means of porting its abundant population.

Until the discovery of this mighty agent, population and the wealth of England were st at a stand still. So lately as 1780 we numbered 8 millions; and 200 years bethe population was 6½ millions. No sooner ever, was the steam engine fairly brought use than that wonderful expansion of our merce commenced, which brought with it a sponding increase in population, and which made England the great mart of the world. quick processes, and rapid results of the factory have of late years been imported into the thrashing of our crops; no wonder, then, that the farmer has begun to regard the ploughing of his land by horse power as a slow and tedious operation, and has become desirous of introducing into his fields the same despatch and the same powerful agency he has found of so much advantage in the preparation of his grain for market."

History.—Although, until a recent period, public attention had hardly been turned to the question, steam ploughing is by no means a new subject.

"(1) As long ago as 1618, one David Ramsey and a Thomas Wildgoose obtained a patent for 'Newe, apte, or compendious formes or kinds of engines or instruments, and other p'fitable invencons, wayes, and meanes, for the good of our Commonwealth, as well as to plougbe grounde without horses or oxen, and to enrich and make better and more fertile, as well barren peate, salte, and sea sande, as inland and uplande grounde, within our Kingdomes of England and Ireland, and our Domynyon of Wales; as alsoe * * * * to make boates for the carriage of burthens and passengers runn vpon the water as swifte in calmes, and more s. ff in storms, then boates full sayled in great wynes

"(2) In the same year that Ramsey took out his last patent, a William Parham and others had a patent granted for a 'certain newe and readie waye for the good of our Commonwealth, for the earinge and plowinge of lands of what kind soever, without the vse or helpe of horses or oxen, by meanee of an engine, by them newly invented and framed.'

"(3) About 40 years after Ramsey and Wildgoose, another genius arose, named Francis Moore, who took out no less than three patents, having for their object 'the dispensing with animal power in tillage, navigation, &c., &c. Mr. Moore states, 'his machine to go without horses.' 'Tis recorded in a periodical of the day that Mr. Moore had such faith in his inventions that he not only sold his own horses, but by his advice many of his friends imitated his example, fearing their value would be affected by the general introduction of his machine.

"(4) About the same time, 1770, another inventor appeared, a Mr. Richard L. Edgeworth, who patented an engine with an 'endless railway,' almost identical with that patented by the late lamented Mr. Boydell.

"(5) In 1810, in which year a Major Pratt obtained letters patent for a steam ploughing apparatus. One of his schemes was to place the engine and anchor on opposite headlands, or in boats, as Mac Rae's. The implement described by Major Pratt may be regarded as the first 'balance plough,' the ploughs being placed back to back, or heel to heel, and working on a fulcrum in the frame, one set being thereby raised out of work while the other set was lowered into work.

"(6) Between 1810 and 1832, numerous schemes were propounded and patents taken out for ploughing, digging, or trenching the land, by engines working in various ways, but I find nothing of real value until the latter year, when the celebrated John, Heathcote, M. P., a lace manufacturer of Tiverton, obtained a patent for certain new and improved methods of draining and cultivating land, and new or improved machinery and apparatus applicable thereto.'

"His engine travelled along the headlands, and when ploughing bogs was constructed with an endless web, forming an endless roadway. His anchor, called by him an 'auxiliary carriage,' also moved along the headland as the work proceeded. Mr. Heathcote described in his specification a means of making his anchor self-propelling. The engine he proposed to fit with two winding barrels, one on each side, so as to work either one or two sets of implements at a time.'

In connection with Mr. Heathcote's scheme, I may mention one fact highly honourable to the foresight and public spirit of the Highland and Agricultural Society of Scotland.

"As long ago as 1837, this society offered a premium of £500 for the first successful application of steam power to the cultivation of the soil. Mr. Hall Maxwell, the zealous and indefatigable secretary writes me :—'At the society's show held at Dumfries the same year, £100 in addition was subscribed to pay the expenses of exhibiting and working what was called 'Heathcoats' Plough"' The trial of this plough was to some extent satisfactory: but the judges did not consider the implement sufficiently perfect to entitle it to the premium. The society, however, continued to offer the prize until the year 1843

"Some 20 years afterwards, the Royal Agricultural Society of England followed the example of the Highland Society, by offering a prize of a similar amount, and it would have done well and saved a great deal of 'heart-burning' if it had also followed the Highland Society in the simple wording of the offer, viz., 'the first successful application of steam power to the cultivation of the soil.'

"(7) Mr. Heathcoat was followed by Alexander Mac Rea, who in 1839 obtained a patent for 'machinery for cultivating land by steam power.' The primary object it would appear, was to adapt his apparatus for use in British Guiana, where the fields are intersected by wide ditches and canals.

"Mac Rea, although his engine and anchor are shown working in boats, described his apparatus as applicable to the unlevel lands by working the engine and anchor along the headlands.

"The implement of this inventor is worthy of notice, for, as the drawings show, it is arranged with the ploughs point to point, as Messrs. Fiskins and Mr. Fowler's, to which it bears a strong resemblance; Mac Rae also anticipated our friend Mr. Williams, of Baydon, by hav[ing] each plough independent of the other, like coulters of a drill.

"(8) In 1849 Mr. H. Hannam, of Bur[...] near Abingdon, a well-known agriculturist, [in] connection with Messrs. Barrett and Exall, [con]structed an apparatus for steam ploughing wh[ich] may be regarded as the first attempt to w[ork] *ploughs or cultivators by the ordinary port[able]* engine, and also to be the first attempt to plo[ugh] the land by an engine stationed at one corner outside the field. We have no evidence [that] wire ropes were ever employed for steam plo[ugh]ing until those supplied to Mr. Hannam [by] Messrs. Barratt and Exall. From Mr. Ex[all we] learn that the ropes were 1600 yards in len[gth], and from the drawings exhibited it will be [seen] that they were coiled and uncoiled by a stat[ion]ary windlass, having two winding barrels, in [the] same manner as those now in use. The r[opes] were also passed round pulleys at the corner[s of] the fields and now so well known.

"About 60 acres were ploughed or culti[vated] by this apparatus at the rate of about 5 [acres] per day, when it appears the rope, from defi[cient] strength, or probably from bad handling, [gave] way. *Doubtless, had more perseverance b[een]* shown, the parties would have been rew[arded] with greater success; but I very much que[stion] whether any system of rope traction would [have] become a permanent success but for the [intro]duction of ropes made of steel wire, which contributed very greatly to their durability.

"(9) In 1851, at the great exhibition, L[ord] Willoughby D'Eresby showed a complete st[eam] ploughing apparatus, consisting of two eng[ines] with a winding barrel on each—*i. e.*, an en[gine] for each headland. These advanced as [the] work proceeded. A number of ploughs on [Hay]cock's turnwrest principle were placed in a f[rame] and wound or drawn from engine to engine [by a] chain. I believe if a wire rope instead [of a] chain had been employed his lordship w[ould] have succeeded.

"*(10) Following up the course of inven[tion]* we next come to the scheme of Messrs. Fi[skin] of Stockton-on-Tees. A stationary engine [being] employed, a main object of Mr. Fiskin bei[ng to] dispense with wire ropes, and give off the p[ower] of the engine by means of a light, en[dless] hempen cord, worked at a high velocity, [which] passed round pulleys on a self moving an[chor] and thence to winding-drums placed upo[n the] implement, the revolution of which imp[arted] motion to the ploughs. The anchors were [self]-propelling, their onward motion being eff[ected] by the revolution of the pulley placed on [the] anchor and round which the rope was pa[ssed]; second, the plough was on the balance prin[ciple] and was steered in either direction by mea[ns of] locking the wheels. This apparatus was ex[hibi]ted at the Royal Agricultural meeting in 1[...] and created quite a sensation; as well as m[ade] a very favourable impression."

(11) In 1854 Mr. Fowler exhibited at the yal Society's meeting held at Lincoln his m draining plough and apparatus.

"In the report of this meeting, published in Journal, a diagram is given of this machine. judges, in speaking of its wonderful per-ances, wind up with these remarks:— rely this power can be applied to more ral purposes; we earnestly commend the to our engineers and mechanists.'"

(12) Whether those to whom the idea was mended took much notice of it or not we do know, but we do know that the idea com-ded itself to a farmer, in the person of Mr. ith, of Woolston, who in a published letter rmed the public that he commenced his riments after reading this report.

"Mr. Smith subsequently ordered an appa-s of Mr. Fowler, with which he proposed to k, and subsequently did work his cultivator. opinion has been prevalent that Mr. Smith a claim to the invention of the whole appa-s; but in 1856, at a meeting of the Society Arts, Mr. Smith admitted 'that his first dlass was constructed by Messrs. Ransomes, r the direction of Mr. Fowler.' I do not tion this to detract from the great merit due r. Smith as a pioneer in steam cultivation, simply that the merit should be properly led or given to the right party; and I will ark, in passing, that I believe Mr. Smith has as much or more than any other man in ing the country to the importance of steam re, and to the fact that land can be omically worked by steam power; he has proved that land can be successfully and inuously farmed by simply 'smashing' or ing, and that inversion of the soil is not so lutely necessary to successful cultivation as generally believed to be."

uses of delayed Success.—Political econo-tell us that the "machinery of a country naturally correspond with its wants, and the history and state of its people." This doubtedly true; the schemes we have ibed having been invented before they were wanted or before their need was felt.

There can be no doubt that a redundant lation and the paralysing effect of the old law had considerable influence in retarding e of machinery in farming; also the wide and deeply seated conviction that the oyment of mechanical power diminished the d for hand labour; and this conviction, was shared by all classes, led people to very little interest in labour-saving inven-

gain for want of railways, coal was at a price, and so distant from the farm, that st districts half the horse power that have been saved by the introduction of power would have been employed in haul-al for the use of the engine.

he revolution which has taken place in farm practice by the substitution of the steam thrashing machine for the flail and the horse gear has, doubtless, been brought about very much through the intersection of the country by railways.

"This again has led the farmer to appreciate the value of and imbibe a taste for steam-driven machinery; it has, moreover, accustomed him to expend comparatively large sums of money in the purchase of machinery. We are creatures of habit, and 'tis astonishing, when we begin to spend money on machinery or anything else, how easy it is to jump from £300 to £500, and from £500 to £800.

Classification of Inventions.—I divide the inventions, which since 1855 have been brought before the public, into the following classes:—1. Engines to travel over the surface, drawing their implements with them. 2. Locomotive engines working on railways and drawing implements after them. 3. Engines moving along the headlands and working implements by means of wire ropes. 4. Engines stationary whilst at work, and working implements by means of wire ropes. A number of schemes under each head have been either brought before the public or patented; and without using names more than absolutely necessary, I will simply allude to the alleged advantages and disadvantates of each system.

"I would here take the opportunity of stating that in endeavouring to bring steam cultivation into practice, I believe no one has worked harder or spent his money more freely than Mr. John Fowler, and so far as I am concerned I hope he may be amply repaid for his great efforts.

"(1) Engines which move over the land. Under these disadvantages, their weight is immense, and they have to propel themselves over surfaces more or less uneven or more or less yielding; the consumption of fuel and water is at least fourfold that of a stationary engine, and the repairs, owing to the irregularities of the surface of the land and greater friction, would probably be tenfold. The weight of such a machine, passing over the land, is also most objectionable. Mr. Romaine, to whom much praise is due, has worked hard to carry out the principle of a rotary cultivator moving over the surface—a scheme so ably advocated by Mr. Wren Hoskyns. I believe, however, Mr. Romaine has abandoned the plan in favour of rope traction, for which he has obtained one or two patents.

"(2) As to the scheme of laying down rails all over a farm and working locomotive engines upon them, whatever may be the economy and despatch of such a system when once carried out, I think it highly improbable, considering the outlay to be £20 to £30 per acre, that it will ever come into use in this country; at all events, not until landlords generally are much richer, and until a disposition to spend their money in the improvement of their estates has obtained more hold throughout the country.

"(3) Next in order are the engines which travel along the headlands as the work proceeds. These doubtless employ their power more direct, and with a smaller quantity of rope than engines stationary at one point, but they have these drawbacks: when the soil is at all wet the passing of a heavy engine along the headlands, and the necessary coal and water haulage after it, destroy in great measure the fertility of the headland, as well as leaving a good deal of hard work subsequently to be done by horse power in bringing the land to a tilth.

"Again, in hilly countries the engine is at work sometimes on a steep ascent and sometimes on as steep a descent, at times inclining to the right, and at others to the left; this will doubtless render the cost of keeping the engine in repair much greater than one that is stationary and always working upon the level. Another disadvantageous feature is that a headland all round must be left unbroken if the field has to be worked a second time by steam.

"(4) Lastly, we will take the engines stationary while at work. The main objections urged against these schemes are, the extra length of rope required, and the loss of power by the employment of pulleys round which the ropes are passed; the advantages claimed are, they are less costly to purchase and to keep in repair, more simple of construction, consequently better adapted for ordinary farm labourers, and irregular shaped fields can be ploughed as well and almost as quickly as square ones. By stationing an engine at one point, fields of 30 or even 50 acres each can be cultivated without any remove of engine or apparatus, and if the farm be well laid out, twice this quantity can be done from one point. A pond or a well sunk at convenient spots saves all water carting, and the coal is all brought to one point instead of having to be carted after the engine.

"Some parties have greatly exaggerated the loss of power entailed by the passing of ropes round pulleys. I have heard it stated in this room that for every pulley used a horse power is sacrificed. Now, so far from this being the case, I find by most careful experiments that when working a cultivator drawing 15 cwt., and the ropes arranged in a square, the loss of power from friction is 25 lbs. per pulley, just one-sixth of a horse-power. Even this is not so great a disadvantage as at first sight would appear, for if the pulleys were reduced to two and the same strain put upon them, thh friction would be increased one-third; this arises from the fact that the ropes would then have to pass half round the pully instead of one-fourth only. The experiments at the Leeds meeting proved most conclusively that very little power was lost in the friction of the wire ropes, when properly supported upon pulleys.

"Mr. Pike, in my neighborhood, has a fi of 50 acres, in which he stations an 8-ho engine, at the extreme corner, where he has a pond. This 8-horse engine, without re moving, breaks up this field of heavy tenacio soil to a depth of 7 or 8 inches, at the rate of or 8 acres per day: so much for loss of pow from pulleys and extra length of ropes."

Achievements.—Having now very imperfec *sketched the rise and progress of steam* cultiv tion, I will, in a few words, sum up what I co sider what has already been anchieved.

"Some 400 or 500 farmers have purcha steam cultivating apparatus, of one kind or oth From the Britannia Iron Works, Bedford, alo about 200 steam cultivators have been sent o

"The experience and the opinions of a la majority of the purchasers have been publish and all, or nearly all, have testified to their proval and appreciation of steam cultivation."

As to the future of steam tillage I shall but little. What effect the general adoption steam power on our farms will have upon country no one can foresee. To expect t steam will do as much for agriculture as it done for manufactures and commerce would idle; but that it will enormously increase productiveness of the country no one who paid the least attention to the subject can fo moment doubt. Whether it will increase c respondingly the profits of the farmer we m wait to see; but it is worthy of remark that most highly remunerative amongst the manuf turing trades of this country have been th which require a large plant in the shape steam-driven machinery. To the landlords the country the question of steam ploughing of the greatest importance, and a few noble and landed proprietors have come forward introduced steam cultivators on their esta but it is mainly to the enterprise of the te farmers that the system has made so much in the country. Landlords will consult t own interests as well as that of their tenants removing all hindrances to the adoption of st power. All unnecessary fences, to say noth of trees in ploughed fields, must be got ri the farms must be properly laid out; and, a all, greater liberty of action must be given the tenant in the course of cropping and o matters, before the resources of our farms be fully developed. That the new order things will have a considerable influence on labourer I have no doubt. The great adva which have been made of late in agriculture, and the changes which are taking place, on our notice the fact that a more intelli and a more careful class of labourers are be ing indispensable to the farmer; and by emp ing these in the use of a higher order machinery they will be a field for the more telligent and useful farm servant. Under old order of things—however willing to en the skilful the farmer might be—this was cult to be found. In conclusion, nothing cates more clearly the great advance ch is being made in the agriculture of this atry than the introduction and spread of a er class of farm machinery. The machinery country has ever been a gauge of the intelence of its inhabitants; iron clad ships and d guns are not the implements of warfare of arous or semi-barbarous nations; nor are m-driven thrashing machines and steam ghs the implement of a backward or bigoted culture.

Rot in Sheep.

Plenty of skins, but we are saying as little ossible about it," was the report recently n us by a friend who lives in a certain sheeping district, which shall be nameless, and of m we had inquired how matters were proing with respect to what some call "the lly people."

Plenty of skins," is a very significant expres- telling not only of actual losses, but of r points to which we may allude before closhese remarks. And when we see the bleached- pastures, saturated with water, and the equal- eached-like sheep, with their wool apparent- uck close down upon their skins, but ready el off at the slightest touch; when we nothe yellow tinge which pervades the eyes, the general absence of that sprightliness h characterizes sheep in high health; and these and other well-known spmptoms are ermore accompanied by the teli-tale "*poke*" we feel assured that if there is not already, soon will be "plenty of skins," although bundant supply of that article is not accomed, in that case, with either profit or satison to the stockmaster.

t is justly dreaded by the sheep-owner as the direful calamity which can befal his flock. eeps off the animals like a pestilence, and if known to exist or occur in a flock, a grave icion arises as to the general health of that —such a suspicion, moreover, becoming, made pubic, a very serious matter; for all are aware of the stigma will avoid the risk rchasing when the seeds of a fatal disease be lurking in the constitution of the animals. these reasons it is of the utmost consequence e sheep-owner that every practicable means be resorted to in order *to cure*, if possible, hat is much better, *to prevent* the appearof this disease, if such can be accomplished.

ow, we may at once say we have no faith in o-called cures for rot, because by the time gins to be so much developed as to attract tion the disease is beyond the power of cine. We must endeavour to prevent the ence of the malady; we may delay its pro- when sheep are even affected by it, but we cannot actually cure it—we cannot eradicate it so as to restore the affected animals to a pristine state of health.

Excessive moisture stagnating in the soil is a predisposing cause of rot. We are not alluding at present to the scientific view of the question, embracing the history of those animalculæ which exist in the livers of rotten sheep: those who are desirous of following out this part of the subject will find it fully and ably discussed in Professor Simonds' admirable lecture, delivered at a weekly council meeting of the Royal Agricultural Society of England, and reported, in Nos. 17 and 18 of our volume for 1861. We are considering the subject practically, and for that reason we refer in the first place to the effects produced by excessive moisture, particularly stagnant moisture in causing rot among sheep. The removal of this agent in the developement of the disease is entirely within our reach. When we drain the land we lessen the probability, if we do not actually remove altogether the possibility, of rot making its appearance on such land. When we say this, we refer to sheep which are bred and kept on drained land. It is true, cases of rot may and do occur on pastures which are either artificially or naturally dry; but if so, we may be certain that the disease is confined to sheep which have been bought in, or brought from another place where draining has been neglected; unless, indeed, some rotting spot has been left unnoticed and undrained in the range of pasture. We know this from experience. We have bought sheep early in autumn—sheep which were apparently perfectly sound when purchased, yet, although put on sound pasture, those sheep have rotted and died to such an extent that very few remained alive out of the lot at shearing time. At the same time, sheep bred on the ground, and others brought from healthy localities, although grazing along with the diseased sheep, and treated in every respect in the same manner, remained perfectly sound. The seeds of the disease were laid in those sheep prior to their purchase, although the disease itself had not become sufficiently developed to attract attention.

Referring to the death of sheep from rot during the winter and spring months, Prof. Simonds remarks that the most dangerous period for sheep is about midsummer, particularly when there is much rain with the elevated temperature of that season. It is at that period the foundation is laid of the disease which terminates, some months after, in a change from a thriving to a wasting state of condition, in jaundice-like appearance of the skin, &c., in the accumulation of that particular swelling under the lower jaw which invariably accompanies this disease, and in all the other tokens of an unhealthy constitution ending in death. We feel convinced that Prof. Simonds' views are correct, and it shows the necessity of avoiding hasty conclusions when rot does make its presence apparent during the winter months.

But as draining has been proved to be effectual in preventing the disease—nay, more, in changing the character of the districts which at one period were notoriously unsound—it is evident that every flockmaster should strive to have his land drained, and thus permanently secure the health of his sheep. Through draining, as we usually understand the phrase—that is, drains 42 or 48 inches in depth, having conduits of pipes or broken stones for the passage of the water—is the system which must be adopted when the sheep pastures are combined with tillage operations; but when this is not the case, a more simple and more cheaply executed mode of draining will suffice to carry off excessive moisture and lessen or remove the danger from rot. Surface draining has proved of immense service in sheep-rearing districts, improving the climate, increasing to a great extent, the production of nutritious grasses, and not only lessening the annual mortality, but enabling the stock-masters to keep more sheep than they could do whilst the land remained in its natural condition.

These drains are from 16 to 18 inches in depth, 20 to 24 inches wide at the top, and 6 to 8 inches wide at the bottom. Double drains—that is, the drains made for the purpose of carrying off the accumulated water from drains of the foregoing dimensions to the nearest main drain or rivulet—are 30 inches wide at the top, 18 inches deep, and 12 inches wide at the bottom. The distance at which the drains are cut from each other depends on the nature of the land, and may vary from 6 yards to 60, according to circumstances. The cost of cutting surface drains of this kind ranges in Scotland, where the system is much practised, from 1d. to 2d. per. seven yards, the double drains being just double the price of the minor drains, each seven yards of the double drain counting as fourteen yards of the other. The acreable cost, therefore, is comparatively trifling, amounting, at say 20 yards distance between the drains, to from 3s. to 6s. per statute acre Mr. Cullen, of Corry, Co. Lincoln, finds "that open drains, 50 feet apart, may be formed 2 wide feet at top, 10 inches at bottom, and 15 inches deep, at a cost of "about 7s. 6d. per statute acre."

Yet, trifling as the cost of such draining is, the benefits resulting from it are immense. Mr. Cullen's experience is "that land so drained (after two years) will be worth double, treble, or even fourfold more than when undrained;" and Mr. Latham, of Alberchalder, Inverness-shire, in a prize report "On Draining Sheep Farms," which appears in the recently issued part of the *Transactions of the Highland and Agricultural Society*, illustates the advantages of surface draining, with reference to rot, in the following manner:—

"Striking instances of the cause and cure of this disease have come under my observation of late years. On an adjoining farm its ravages were very serious previous to the marshy ground being drained, but as soon as this was accomplished the rot gradually disappeared, and sheep became, under careful manageme[nt] sound and superior stock. Now, however, being open for thirteen or fourteen years, [the] drains, which were cut much too shallow, are gradually filling up, *and the rot has re[turn]ed.*"

Open surface drains, we must observe, sh[ould] be scoured out once in every three or four [years,] and if this is done the drains will be kept al[ways] in good working order, at a trifling expense.

If pastures which contain much stagnant [mois]ture are of such a nature as to cause rot, [it is] certain there are some other points in ma[nage]ment which tend to foster the development of [the] disease. Some of the most prominent may [be] summed up in one word—over-stocking—be[cause] this not only includes the want of a suff[icient] amount of nutritious food, but also the fo[uling] of the pastures—a circumstance which is hi[ghly] detrimental, whenever it occurs, to the heal[th of] sheep. To confine a lot of sheep on a li[ttle] piece of pasture for months, without ch[anging] them to another field where they can get a [fresh] bite—that is, where they are entirely depe[ndent] on the pastures—is about the worst treat[ment] sheep can receive. Yet we often find it pra[ctised] —we find lambs, when weaned, put on a[n] indifferent piece of grass, kept there during autumn and during the winter, without b[eing] shifted for a single day; and when such i[s the] case, we never feel surprised to learn that [there] are "plenty of skins" lying about the ex[tensive] premises. Dirt and starvation are sure me[ans of] bringing on disease on the human subject, dirt and starvation are just as certain to bri[ng] disease and lead to death among sheep. [We] have heard of pasture lands which bore a [good] character—where rot was, in fact, unkno[wn] until the flocks were increased beyond the [num]bers which the land previously carried, and [no] sooner was this done than rot appeared, nor [was] the disease banished until the flocks were re[duced] to the former compliment.

Professor Simonds shows that a gen[erous] diet will stay the progresss of rot, if it will [not] actually prevent its appearance. Alludi[ng to] sheep in the earlier stages of the disea[se, he] says:—

"If the simple plan of protection with [a] genous food is persevered in for some [time] you may often save your animals. I did [it;]" he further says, "many years ago, I pur[chased] a number of rotten sheep: I gave th[em no] physic of any kind, but merely kept th[em in] sheds during the winter time, fed them with [corn] and cake, giving them the most generous [diet] I could; and I not only prevented the [further] progress of the disease in several of these [animals,] but I even made the animals accumulate [fat,] and they went into market in the foll[owing] spring, forming pretty fair meat for the [butcher.] This shows what can be done by generous [diet] and a protection of the animals."

In the course of his remarks, Professor Sim- ... showed that he still followed the same ...tice when apprehensive of rot. Referring 1860, he said :—

"Now, what have we had in the past season? ...e have had a very wet summer. I had a num- ...of sheep, and foresaw what was coming. I ...d to some of my neighbours, 'We shall have ...reat deal of rot this year;' and I thought I ...ld attempt, if I could, so far as my own ...p were concerned, to save them. What did ...? The sheep were on wet meadows, up to ...fetlock joints, nearly every day, and nobody ...uld avoid it. But at midsummer I began to ...d the lambs and sheep with corn and nitro- ...ized food, giving them with every meal a ...ll quantity of salt. I continued that plan ...ng the autumn, and I have the satisfaction ...saying that I do not believe at the present ...e [April 1861] I have one of those lambs af- ...ted by rot. I kept killing them week by ...k to watch their progress."

Before concluding his lecture, he again return- to the advantages derived from the use of ni- ...genized food—that is, food which forms ...d and flesh, not fat—and wound up his re- ...ks in the following manner :—

"I again say, that if we commence at mid- ...mer, and continue the treatment through the ...gerous period of a wet season, we may do a ...t deal in the prevention of the disease. And ...ay go further, and say that even on farms ...re we have what are called rotten pastures, ...which sheep are placed, they may be pre- ...ed to a very considerable extent, simply by ...ing nitrogenized food and salt, to destroy ...e creatures within the stomach, and to pre- ...t their final change, alternating with the salt ...nic, invigorating agent, such as sulphate of ... I do not depend on the salt alone—far ... it; but it is a valuable agent, and its value ...nds more upon putting these things into ... water, as it were, in the stomach, than any- ...g else. This is the course I recommend. ...have to look to the condition of the liver ... wet season; you have to look to the neces- ... of laying the foundation for a good quality ...blood, by giving these animals nitrogenized ..., and throwing sulphate of iron into the or- ...m. . . . . This is the reason why ...hate of iron should be employed. It should ...iven in fine powder, and in doses of about ... a dracham a day; not, however, that a ...er quantity would be prejudicial. The sheep ...ld be divided into small lots; and if you ... about a score feeding in one trough, there ...ld be ten drachms of sulphate of iron mixed ... the food for the day: and then, if one ...d get a little more, and another not quite ...uch, it will be of very little importance."

...he publication of Professor Simonds' lec- ...drew out a letter from "A Yorkshire clay- ...farmer," which first appeared in the *Mark ... Express*, and was transferred to our columns in the 13th number of last year's vol- ume—page 231. The writer of that letter had suffered for many years from rot, owing to the "marshy nature of the soil" of his farm "and poverty of the herbage."

Twelve years ago he had commenced giving his sheep "about one gill of fine old dry barley each during the autumn and early part of spring," and so satisfied was he with the results, that he persevered in the practice during all the twelve years, having kept his sheep in perfect health by means of this more nutritious diet than the "poverty of the herbage" of his farm could have supplied them with. This is precisely the same principle as that upon which Professor Simonds acted, "for fine old dry barley" contains a considerable portion of nitrogenized matter.

If, therefore, we are desirous to ward off that fatal disease which we have been discussing in these brief remarks, we must make up our minds to relieve the pastures from the superabundance of moisture with which they are saturated, and which, at present, remains stagnating in the soil; we must stock our pastures moderately; we must protect our flocks as much as possible from the inclemency of winter; we must feed them on generous diet, thus "laying the foundation for a good quality of blood;" and when we have fulfilled all these conditions, we may rest assured that if we have in future "plenty of skins" these will be in their proper place—on the outside of good, healthy, living bodies.—*Irish Farmers' Gazette.*

Agricultural Intelligence.

Spring Shows.

We are informed of the following Shows to take place this Spring. We request secretaries of Agricultural Societies to inform us of the date of their exhibitions at as early a date as possible, so as to admit of publication in time to be of use to those interested :—

Fullarton, Logan, and Hibbert Agricultural Society, at Mitchell, April 2.

West Riding of York Agricultural Society, at Weston, April 23.

King Township Show and ploughing match; at Kettleby, April 22.

Reach and Scugog, at Epsom, April 29.

Pickering, at Duffin's Creek, April 30.

West Gwillimbury, at Bond Head, April 30.

Brant Township, County Bruce, at Walkerton, April 28.

County Peel, at Brampton, May 1.

North York, at Newmarket, April 30.

County Halton, at Milton, April 23.

Walpole, at Humstreet's Hotel, Stage Road, April 16.

Rainham, at Rainham, April 18.
Western Branch, Haldimand, at York, April 23.
County Haldimand, at Cayuga, April 24.
County of Lincoln, at Grimsby, April 22.
Hamilton Horticultural Society, 1st Show, May 24.
East Middlesex, at London, April 29.
Lobo Township Society, at Mr. E Cutler's, April 19.
County of Norfolk, at Simcoe, April 9.
West Middlesex, at Strathroy, April 24.

Removal of Mr. W. H. Lock.

Our readers will regret to learn that Mr. W. H. Lock, of Yarmouth, Elgin, the well known agriculturist and breeder of Devon cattle, has left this Province, and has taken up his residence near Urbana, Champlain Co., Illinois. Mr. Lock has been the most successful breeder and exhibitor of cattle in the county, and has taken more prizes for his Devons than all the other breeders combined. Mr. L. imported the stock, six in number, fourteen years ago, and at this time the progeny are to be found scattered all over the Province. He has bought a farm of 1,300 acres of land, 800 acres of which are improved, 300 in grain, and 200 in wood. Besides this, he has rented 500 acres. He took with him seventy-eight head of his fine Devon stock; one hundred pure bred sheep; thirteen horses; six hogs of the finest quality, besides a large assortment of implements. His wife, three sons, and one daughter have gone with him. Upon enquiry as to the cause that induced Mr. Lock to leave we find, that he thought that by removal to the States he would be less heavily taxed than in Canada—a most erroneous idea, for in addition to the ordinary State taxes, at all times heavier than similar imposts in Canada, the cost of the war has yet to be paid, and the landed interest will naturally be the one on which the charge will principally fall. We are sorry to lose Mr. Lock, sorry that so much valuable stock has gone with him, and sorry that so far as taxation is concerned he will find that he has jumped out of the frying pan into the fire. —*London Free Press.*

Horticultural.

Fruit Prospect in Niagara Township.

EDITOR AGRICULTURIST:—As the fruit crop forms an interesting topic for inquiry, your readers in Toronto, and the cities north of the lake, will be glad to learn, that up to this date, the prospect of peaches is all that we could desire. The fruit buds are uninjured by the frost of last winter, and the cold weather of March, has retarded the swellin of them, and as there was no crop last yea the trees are in fine condition, to produce a abundant one this, if not injured by the la spring frosts. But as a general thing we d not apprehend much danger from this cause The cold winds from the lake greatly retar the opening of the blossoms, and often pre vent a frost near the lake shore, when a fe miles back every thing is cut off. It is sel dom that we lose our peaches by spring frost The greater danger we are exposed to, i that of the buds not being sufficiently ripen in the fall, or by being pushed too forwa by the late warm moist weather of autumn, was the case last year. *In such cases a fe* degrees below zero is sufficient to destro them, while in a proper condition they wi bear even twenty degrees below zero wi impunity. I am *glad to say that there* several large peach orchards in this vicinit that will be in good bearing order in one two years more, that will afford you a suppl *even if our friends across the river should* excluded by the repeal of the reciproci treaty. In the last two or three years a gr number of trees, principally apple, pear, peach, *have been planted in this townsh* more particularly that tract lying along t river and lake shore from Queenstown to the city of Hamilton, which may be sty *the fruit garden of Canada, par excelle* More especially so for the supply of the la cities along the lake and the river St. La rence, enjoying as it does an easy commu cation with them all; which is much m favorable as well as cheaper than railr transportation.

As the season for planting orchards is n at hand, I would earnestly *entreat those* tending to put out trees to plant no m than they can well attend to. It is n necessary that land for orchards should be *the very richest description, nor yet is it ne* sary that the trees should be over fed abundant applications of manure. Trees, l children, can be killed by kindness, but t *is the exception not the rule. Any g* wheat land will do for apples or pears; it all the better if it has a mixture of clay in And all good corn land will produce g *peach trees, climate being favourable.* course good surface drainage is necessary, under drainage highly advantageous, to successful cultivation of fruit or any o crop. *Subsoil plowing is a very great be* to a young orchard, and should be done be planting, as it can never be so well done a ward. Let any one be assured that fifty t *well planted and cared for are worth* than five hundred stunted, moss covered and in ten years give more bearing trees.

It is really distressing to see a lot of yo

-s struggling for existence in a field of blue -s or Canada thistles, broused off by cattle barked by sheep, while it is indeed a plea- re to see a thrifty young orchard growing under one's careful management, and in a w years it will repay any generous treatment may have received. But a neglected or- ard is a subject of constant reproach and ways ends in pecuniary loss.

I am glad to see such active exertions being -de to establish a fruit growers' association - Upper Canada. It is a society eminently uired for the wants of the country, and I feel nfident from the names already connected th the enterprise that it will prove a success. e information that it has already diffused regard to some fruits being hardy in certain -lities, and not hardy in others, is especially erested to those intending to plant, and if ended to by them may save much expense d disappointment.

Since writing the above we have been visit- with a very severe storm of sleet accom- nied with a high wind. That veritable in- dual the "oldest inhabitant" never recol- ts of so much ice being on the trees, small es of last year's growth were loaded with les of an inch and a half in diameter. Of rse such a load swayed by a heavy wind de great destruction among trees, but the er peach trees were the greatest sufferers, ink fully one half the bearing wood of trees is destroyed, while the younger though not so badly broken are sadly tilated

R. N. BALL.

Niagara, March 20th, 1862.

the Failure of the Apple Trees in the neighborhood of Montreal.

Communication to the Committee of the Natural History Society of Montreal. By OHN ARCHBOLD.

(From the Canadian Naturalist and Geologist)

he failure of the apple trees in the neighbor- of Montreal, and I believe in all the Island, sad calamity as regards domestic luxury, as as in a commercial point of view. I have Montreal in its palmy days of apple-growing, rt its thousands of barrels of Pommes , Bourassas, and Fameuses. These were principal sorts sent to Europe, the refuse of as well as the great quantities of the wild , that is apples from seedlings, always a ready market at Quebec and the ports it, at remunerative prices. With these before us, it is not to be wondered at, that enquiry should be made by all who feel least interest in the culture of the apple, as cause of its decay. I have been a resident ontreal since 1832, and for the last twenty- years have lived on the south-eastern slope of the Mountain, on the Cote St. Antoine road, and have acted in the capacity of gardener at Mount Pleasant, the then residence of the late Joseph Savage Esq.; also at Rosemount, the residence of the Hon. John Young, and subsequently at Forden, the residence of Capt. R. T. Raynes and of the late Charles Bowman Esq.; one of the most zealous friends and supporters of Horticulture, in his day, that Montreal could boast of. All these places were noted for the production of fine varieties of the apple, the pear, and the plum. The latter place, Forden, in particular, used to yield about fifteen years ago, from 1,000 to 1,500 lbs. of fruit, but the last three years have made sad havoc with the trees, and unless some reaction in the growth take place, there will not be one of the old trees living, three years hence. I noticed the decline of some sorts of the apple twenty years ago. I had a talk with the late Henry Corse Esq., about that time, on the failure of the Early Harvest apple, and he was under the impression that it was then extinct about Montreal, but I convinced him that it was not, for in each of the above mentioned places, I had seen trees of the Early Harvest which gave from three to four barrels of good apples, but these few trees are, I have every reason to believe, now gone. There were also the Ribston Pippin, (much on the decline these last ten years,) the Keswick Codlin, Hawthornden, Grant's Major, John Richardson; but these and some others, I always looked upon as being tender, from the softness of their wood, which is not nearly so hard as that of the Bourassa, Pomme Grise, and Fameuse, and therefore, do not wonder at their destruction. These latter sorts have, however, for the last ten years been declining in vigor of their growth, and size of their fruit. I was for some time under the impression from what I could learn from some gardeners, and other cultivators of fruit, that the above named three sorts of apples, would not bear fruit in any other locality than in the Island of Montreal, but that impression was completely removed on visiting the Provincial Exhibition held at Brantford, C. W., some years ago. I saw there as fine specimens of the Bourassa as Montreal could produce in its best days. At Hamilton I also visited some of the gardens, and there to my surprise, I found the Pomme Grise, Fameuse, and Ribston Pippin, growing side by side, and loaded with fine fruit, with not the slightest appearance of decay. These remarks, however, are by the way; the point of discussion at present is the cause of the decay in the apple trees in the vicinity of Montreal. There will, no doubt, be a great many opinions put forth on the subject, and some light will, I hope, be thus thrown on both the cause and the cure. Were the decay confined to one place, one kind of soil, or one mode of pruning or culture, there would be less difficulty in discovering both the cause and cure, but when we find the decay in one fell swoop, taking off the whole of the young orcharos that have been planted within these fifteen or twenty years past, and that even the old *savage*, as the Canadians call it, that has stood the severity of the winters for the last fifty years, is suffering the same fate, the difficulty of giving an opinion is all the greater. When also it is observed that apple trees both in the most sheltered nooks and on the bleakest exposures, on the best alluvial soil, and on the gravelly and lime-stone rock, all alike share the same fate, the necessity of careful consideration is much increased. I noticed in several of the apple trees, after the severity of the winter three years ago, that many of the large limbs became disordered by their cellular tissues not admitting that uniform and free flow of sap to the outer extremities of the branches, which was necessary for healthy growth. The consequence was, that there remained in the trunk an overflow of sap, and some very severe freezing nights coming at the time, the sap froze, and caused the outer bark to burst; the trunk soon after presenting a black and decaying appearance. This is one of the causes to which I attribute the decay.

I have also observed in gardens and orchards, at a season when the trees are in full vigour of flower and foliage, that they have been completely denuded of their leaves by the ravages of the caterpillar; thus being left bare to the influence of a June sun, their health and vigour were seriously impaired. I have observed that trees which suffered so, for two years in succession, hardly ever recovered from the effects of it; this is one other cause to which I attribute the decay of the apple. To avoid injury to the trees, care should be taken as to the time of pruning. When this is done in the beginning of March, or, as is sometimes the case, before that time, and wounds are left bare, without any cover or protection, the influence of a hot sun by day, and hard frost by night, is such, that these wounds emit a portion of the sap, and cause the parts affected to become black, a sure forerunner of decay. In my humble opinion, that work should be deferred till later in the season. My reason for forming this opinion is, that I have observed in my practice of budding, which commences about the middle of July, for stone fruits, and continues all through August for the pear and the apple, having to cut and prune the stocks to a considerable extent, I always found the wounds, at that season, to heal up very quickly, and leave no trace of black, such as might be seen in early spring pruning. Another cause of decay, seems to me to be some kind of atmospheric agency, for I have frequently noticed a portion of the branches of apple trees, becoming black in parts where there were no wounds. Sometimes at the junction of the lateral branches with the main branch, and sometimes near the outer extremity of the branch. Some persons attribute the appearance to lightning, but that appears to me rather doubtful, for although thunder and lightning [is] common in the summer months, in Canada, [I] never noticed any parts of apple trees to [be] blackened to the extent they now are, until the last four years past. There might, inde[ed], occasionally have been symptoms of decay [in] some trees, and in certain localities, but [the] cause in such cases was easily accounted fo[r]. This commonly occurred when trees were plant[ed] in hard blue sub-soil, saturated with water at [all] seasons of the year, without the least attentio[n] being paid to drainage. On consulting any [of] the British authors who have written on [the] culture of the apple, they will all be found [to] agree that the soil should undergo a thoro[ugh] preparation previous to planting, and that [it] should be trenched at least to the depth of t[wo] feet. If such preparation is an essential in s[uch] a mild climate as Great Britain, it is much mo[re] so in Canada, where we have frequently such long continuance of drought in the summer, [and] severe frost in the winter. I have often be[en] struck with the short life of the apple trees ab[out] Montreal. There was an impression made [on] my mind, in early life, that the apple was a lo[ng] lived tree. I have known apple trees in [the] west of Ireland, in the neighborhood of [the] town of Sligo, to attain the age of 150 ye[ars] and then to be bearing good crops of apples. [I] also find that A. J. Downing, one of the m[ost] reliable and best American authors, in writ[ing] on the long age of the apple tree, says he saw [in] Rhode Island, two trees 130 years old. [He] however, reckons our fine garden sorts to [be] only from 50 to 80 years. Now, I question [if] we could find about Montreal any of our [fine] garden sorts half that age, that is 40 years [old]. He also strongly recommends trenching the [soil], and says it adds greatly to the long life of [the] trees. I must confess that I have not seen [the] proper attention paid to fruit trees in the ne[igh]borhood of Montreal which they require. [I] have seen, in many cases, trees planted on [the] green sward, without any other preparation [than] simply making a hole and putting in the t[ree], leaving it afterwards to take care of itself. [In] such cases the result may be easily conjectu[red]. In taking up numbers of both pear and a[pple] trees, the heads of which were dead, I [have] found that their roots were generally perf[ectly] sound, not showing the least symptom of d[ecay] below the surface. The cause of decay does [not] therefore lie with the root.

The question often occurs to me, shall [we] ever see Montreal producing the fine fruits [which] it had twenty-five years ago? The ma[rkets] were then filled to overflowing with the [finest] varieties of the plum and the pear, and a [very] good quantity of the peach and apricot, of [open] wall culture. Now there is no such thing [to be] found as a good Bon-chretien pear, or [an] Autumn Bergamot, or a Burmese Spruce, or a lucious Bolman's Washington plum, [a] Greengage, or even a coarse Magnum Bo[num].

...t seldom will you find a good basket of ...mmon wild red plum of the country. I also noticed a decline in the vigour and ...h of several other plants, these last few past, in comparison with what might have ...een twenty years ago. Then I saw the ...s about Montreal produce enormous crops ...lons, with very little care or attention; ... is uncertain if you can get a good crop ...ll the care you can give them. I have ...en good crops of grapes raised in the ...s and have myself raised at Mount ...nt, good crops of the Sweet Water and Cluster in good condition, in the open ... Then there was no such thing as the ..., or the nip, as it is now; nor was that ...ome pest, the curculio, known about ... Yet with all these facts before us, it ...t do to be idle lookers on; better to be ...l doing. I would suggest that any man ...ed of land, whether little or much, should ...ees according to his means, and let what ...ed, be planted in the best possible way, ...der the best conditions of the soil and ... He may then hope for good results in ...come.

...e few remarks, hastily penned, are ...fully submitted to the Montreal Natural ... Society.

...n, 6th January, 1862.

...Growers' Society of Western New York.

ANNUAL MEETING.

...ruit Growers' Society of Western New ... its Annual Meeting at the Court- ... the city of Rochester, on the 8th ult. ...ting was large, and its discussions inter- ...d harmonious.

...T FORM FOR AN APPLE TREE.

...t is the best form of an Apple tree, ...ch is the time for pruning?

...RP thought he might not agree with ...his views of pruning. Would head ...trees low. Branches pruned near the ... more vigorous and stocky than those ...her up the main stem. They show a ... to ascend instead of running out ...y, make a good spreading top, and ...more weight without injury. Trees ...this way are also less exposed to the ...this is particularly the case with pears. ... agreed with Mr. Sharp. Branches ... the root are stronger than those ... or seven feet from the ground.

...ER considered the question a difficult ... grow naturally of all forms. The Spy has an upright growth, Greening crooked and drooping, while the Baldwin makes a round-headed tree. Cut out the young wood from a Tompkins County King, as is desirable for a Northern Spy, and soon there would be no bearing wood left. The variety requires shortening, while the Northern Spy requires thinning out. It is well to study the habits of trees, for, do the best we can, they have their peculiar shape.

Mr. MOODY said they had come to some system of culture that would suit farmers. Farmers would not use the fork. He found no evil from ploughing. Commence ploughing when the trees are young, and the roots will not come near the surface. Would form heads four or five feet from the ground. Some tender trees have the bark injured by the sun in winter. This is prevented by growing branches low.

Mr. BEADLE said the climate in which trees are grown may have a good deal to do in determining the form of the tree. Mr. Moody spoke of the sun burning the trunks of trees. Had seen the same frequently in Canada, the bark injured for seven or eight feet up the trunk. Thought it the effect of the sun followed by hard frosts. By keeping the head low the trunk is protected. Never saw any ill effects from heading trees low. In Canada they have severe south-west winds. Every tree leans. The main crop is blown off high trees. Mr. B. would not use a plough under or near the the trees, in an orchard. The roots like to come near the surface for air and dew. Use a cultivator.

J. J. THOMAS had made a good deal of observation in the length of roots. The radius of the roots is equal to the height of the tree. If the tree is twenty feet in height the roots will extend twenty feet from the trunk in every direction. Mr. T. enquired if any one had ever known injury to result from ploughing an orchard? The tearing of the roots a little, he thought, not so injurious as neglecting to stir the soil. Apple roots, many of them, go down low, but peach roots lie near the surface.

Dr. SYLVESTER said it is necessary to shade the trunks of trees, and it is also necessary to keep the tree growing to obtain good fruit. To effect this it is necessary to keep the ground well cultivated, and it is hard to do this if the head is formed very low.

At the close of the discussion on this subject members were requested to prepare and leave with the Secretary a list of the best six summer, the best six autumn, and the best twelve winter varieties. The following is the aggregate vote:

Best Six Summer—Two Sweet.

Red Astrachan	12	Summer Permain	2
Primate	10	Early Joe	3
Early Harvest	8	Lowell	1
Early Strawberry	8	Benoni	8
Keswick Codlin	2	Sweet Bough	12
Summer Rose	5	Golden Sweet	8

Best Six Autumn—Two Sweet.

Colvert	2	Munson Sweet	7
Twenty Ounce	10	Fall Jennetting	1
Gravenstein	9	Twenty Ounce Pippin	1
Duchess of Oldenburgh	7	Pumpkin Sweet	1
Porter	7	Maiden's Blush	1
Jeffries	8	Fall Pippin	2
Pomme Royal	3	Sylvester	1
Beauty of Kent	2		

Best Twelve Winter—Two Sweet.

Rhode Island Greening	13	Minister	1
Tompkins Co. King	12	Smith's Cider	1
Northern Spy	12	Norton's Melon	1
Baldwin	12	Canada Reinette	2
Tolman Sweet	14	Blue Pearmain	1
Spitzenburgh	8	Raule's Jannet	2
Golden Russett	8	Seek-no-further	2
Roxbury Russett	7	Green Sweet	3
Peck's Pleasant	7	Ladies' Sweet	5
Yellow Bellflower	6	Cooper's Market	2
Pomme Gris	4	Cranberry Pippin	1
Canada Red	5	Ribston Pippin	1
Swaar	6	Bailey Sweet	3
Red Cheek Pippin	3	Jersey Sweet	3
Wagener	6	Pound Sweet	1
Belmont	2	Hill Sweet	1
Fameuse	7	Pomme d'Or	2
Rambo	5	Jonathan	1
Vandervere	1	Mother	2

Mr. Barry announced that among the distinguished fruit growers present, he was happy to observe the Rev. J. Knox, the celebrated Fruit Farmer of Pittsburgh, who has two hundred acres in fruit, and fifty acres in strawberries The President requested Mr. K to favour the meeting with an address.

Mr. Knox stated that as he had more experience with strawberries than any other fruit, and without pretending to make an address, he would give the members the benefit of his experience in strawberry culture, treating of soil, preparation of soil, cultivation and varieties. He considered a rather light clay soil best for strawberries. The first work in its preparation is through drainage, next breaking up or pulverizing, from twenty to twenty-four inches in depth. This is effected by the plough alone. First use an ordinary plough, with two horses, followed by Mapes' lifter, a kind of sub-soil plough, with two yokes of oxen. Give the ground several ploughings in different directions, until it is well broken up and pulverized. Could produce two or three very good crops on land ploughed in the ordinary way, eight or ten inches, but on that two feet deep could obtain ten or twelve crops in succession. Strawberries do not require much manure. Any good wheat or corn land is good enough for strawberries. Plants in rows thirty inches apart, and the plants ten inches apart in the rows, making twenty thousand plants to the acre. When he commenced strawberry culture, Mr. K. ploughed between the rows, but latterly has discarded all implements in his strawberry plantations, except the hoe. Weeds are taken out by hand. The less soil is disturbed after planting the better, as the whole ground is covered with a net-work of small, fibrous roots. Never allows the vines to bear the first year planted, but picks off all the fruit stems and runners, and removes the runners every year that the plant is fruited. Pr setting out early in the spring. Protects plants in winter by wheat or rye straw, thr with the flail. Oat straw is not heavy eno and blows off. Plants bear much better for protection. The straw is removed in the spr and placed around the plants as a mulch, helps a little towards furnishing manure. half the straw is wasted each year, and need be supplied every autumn. Two tons to acre is about the right quantity of straw commence with, but after that, one ton of straw each season will answer. Varieties succeed in some soils and situations, fail others. The Hovey is good in Boston, and K. had seen it good in Cleveland, but with it never succeeded. Some varieties seem to out after culture a number of years. Pist varieties do better when impregnated with staminate sorts, than with others. On subject he is trying experiments. The st berry season ought to be lengthened. I usually about three weeks, but with pr selection of sorts, can be extended to five The sorts Mr. K. liked best were the follow

Early.— Baltimore Scarlet, Jenny L Burr's New Pine.

Late.—Trollope's Victoria, Kitley's G Nimrod, Buist's Prize.

Medium.—Brighton Pine, Boston Pine, Avoy's Superior, Scott's Seedling, Moy ing, Downer's Prolific, Fillmore, Golden S British Queen, Vicomtess Hericart de T. Wilson's Albany, Triomphe de Gand.

The Apiary.

Ants.—To Keep Away from Hives

When hives are properly constructed, ants not get into them to propagate their y. They frequently, however, get into hives in sequence of not being properly constructed, do much injury as they annoy the bees, inj hive by eating into the wood, and will honey if accessible. It is very little trou drive and keep the ants away from the hi though much trouble has been experien many, for the simple reason that they k remedy. *To drive the ants away from* or out of their retreat, direct upon them a quantity of the smoke of wood or to Each one will usually shoulder a number of young, and "secede" *instanter!* *To ants away from the hive*, apply, as soon have mostly disappeared, thinly in places they frequent, with the feather part of a *spirits of turpentine*; they will not be seen in general, during the remainder of that but should they return, repeat the app This preventive is very simple as well cacious; try it.—M. M. Baldridge, *Journal.*

PROFITS OF BEE-KEEPING.—Mr. R. H. Davis, -actical farmer, and one of our subscribers, o has a large and well-managed farm at Larone, Somerset county, furnishes us with the follow- notes relating to the profits of his small api- during the year of 1860. In the spring of t year, Mr. Davis had four swarms, which 'ng wintered through, he valued at five dollars h, or twenty dollars. These four swarms sent during the season ten new swarms, eight of ich were worth in the fall four dollars each, thirty-two dollars. The other two swarms ' not honey enough to winter on. It was, efore, strained and sold, (thirty pounds), as cents per pound, which amounted to three ars. From the eight new swarms Mr. Davis ' two hundred and fifty-eight pounds of box ey, at twelve and a half cents per pound, mounting to thirty-two dollars and twenty-five ts. There was also some wax made, not taken account. The old stocks of bees were reck- d at four dollars each in the fall, the same as new swarms. This gives a clear profit of .25 from four swarms in one season. Who give a better account from so small a lot of ?—*Maine Farmer.*

Editorial Notices, &c.

SECOND ANNUAL REPORT OF THE PROVINCIAL .D OF AGRICULTURE, NEW BRUNSWICK.— are indebted to Jas. G. Stevens, Esq., etary of the Board of Agriculture in the r province, for a copy of the interesting .e under the above title. It contains a ment of the doings of the Board during the 1860 and 1861; Essays on Agricultural ects; Reports of Committees, &c. &c. Ap- .d is the Report of the first Provincial bition held under the superintendence of the , in 1861, from which we may learn that progress has been made in Agriculture, factures, and arts, and generally in develop- e great natural resources of the province, good grounds for sanguine expectations future. We shall be happy to hear of ontinued progress of the agricultural, as as all other important interests in the bouring province.

H ANNUAL REPORT OF THE SECRETARY OF INE BOARD OF AGRICULTURE, 1860.—We s welcome the Agricultural Report from tate of Maine, edited by the accomplished le Secretary of the Board of Agriculture, Goodale, Esq., as amongst the most valuable of the publications which come to our table. Amongst the contents of this volume is placed the able treatise by Mr. Goodale on the "Principles of Breeding Domestic Animals," which we had previously received, and noticed in a separate form. Besides the usual reports of proceedings of the Board, and abstracts of returns from the Agricultural Societies of the State, there are also essays on Sheep Husbandry, Underdraining and Deep Tillage, Irrigation, Practical Entomology, &c. &c.

COUNTY OF PETERBORO'.—By the courtesy of the Rev. V. Clementi, President of the Peterboro' Horticultural Society, we are in possession of a neat pamphlet entitled "An Exhibit of the Progress, Position and Resources of the County of Peterboro', Canada West, Based upon the Census of 1861, together with a statement of the trade of the town of Peterboro';" by Thos. White, Jr. This little compilation makes a useful and convenient hand-book of reference for those interested in that county, and also contains some interesting information in regard to the progress of the new settlements in the rear of that part of the country.

Some of the above-mentioned publications have been received a considerable time, and we have to apologize to the donors for accidentally omitting to notice them sooner.

GEORGE LESLIE,
NURSERYMAN.

OFFERS FOR SALE, THIS SPRING, A GENERAL assortment of Nursery Stock, consisting of

Apples, Standard and Dwarfs,
Cherries, do, do.
Pears, do. do
Plums, do. do.
Peaches, do, do.
Appricots and Nectarines,

GRAPE VINES,

NATIVE AND FOREIGN.

CURRANTS, GOOSEBERRIES, RASPBERRIES, BLACKBERRIES, STRAWBERRIES, &c., &c.

The collection of fruits cultivated is extensive, and embraces all the different varieties that have been found of value, as well as those of late introduction.

The ornamental department is also extensive, consisting of Shade Trees, Shrubs, Roses, Hardy Herbaceous Plants, &c., &c., with a fine collection of Evergreens.

LARGE TREES
FOR
STREET PLANTING,

can be supplied, as also Evergreens, and Deciduous Plants for Hedges.

All the above are of FIRST QUALITY. Packing for a distance carefully performed by experienced hands.

All orders by post or left at the Nursery, will have prompt attention.

Catalogues forwarded gratis on receipt of 2 one cent. stamps.

Address GEORGE LESLIE.
Toronto Nurseries.
Toronto.

TORONTO NURSERIES,
April 1862.

Seeds! Seeds!! Seeds!!!

JOHN GEORGE WAITE,
181 *High Holborn, London, England.*

HAS THE LARGEST STOCK of VEGETABLE, AGRICULTURAL, and FLOWER SEEDS, IN THE WORLD, and can supply dealers on better terms than any other wholesale house, as he makes most extensive arrangements with none but experienced growers to produce his supply of seeds, which are raised and grown from stock selected under his own personal superintendence, and as they are all cleaned and picked in his own extensive warehouses by an auxiliary strength of several hundred men and women, kept for that purpose, he is enabled to recommend, with the greatest confidence, every description of Seed offered by him for sale, and he therefore invites Seed Dealers to apply for his Catalogue.

TERMS—Cash, or satisfactory references in England.

March, 1862. 6t.

Fresh Garden, Field, & Flower Seed

FOR SPRING SOWING.

JAMES FLEMING & Co, Seedsmen to th Agricultural Association of Upper Canada beg to inform their friends, and the Farmers Canada generally, that their stock of Fre Seeds is now complete and very extensive, embracing almost every kind of seed suitable the country. The stock of Agricultural Se is large and well selected. The vitality of ev sort is carefully tested, and their genuineness may be fully relied upon. A large stock Peas, Timothy, and Clover:

Spring Tares,
" Wheat,
Black and White Oats.
Swede Turnips, Purple top.
" " Green top.
" " Laing's Improved.
" " Skirving's Improved.
White Globe Turnip.
Yellow Aberdeen "
" Altringham "
Waite's Eclipse Turnip.
Stubble or Six Weeks "
Mangel, Long Red.
" Long Yellow.
" Yellow Globe.
" Red Globe.
" New Olive Shaped.
Sugar Beet.
Field Peas, several varieties.
Marrowfats, " "
Barley, two and four rowed.
Buckwheat.
Indian Corn, several *varieties*
Alsike and White Clover.
American Orchard Grass.
Kentucky Blue Grass.
English Rye Grass.
French Lucern.
Cow and Rib Grass.
Carrot, White Belgian.
" Long Orange.
" Altringham.
Parsnip, Hollow Crowned.
&c., &c., &c.

Also a full and general assortment of kinds of Garden Seeds: a Catalogue of w with directions for sowing, can be had on cation. Agricultural Societies ordering will be supplied on liberal terms. Co Merchants supplied with complete assort of Garden Seeds on Commission, neatly p in boxes of 200 papers each, for retaili five cents a paper. Also a large assortm Flower Seeds, embracing the novelties season.

No. 126 Yonge Street, Toronto.

March, 1862.

...ricultural, Horticultural, &c.

...following Books on these subjects to be had at

BAIN'S BOOK STORE,

...6 KING STREET EAST.

...'s Modern Horse Doctor, cl.	$1 00
. American Cattle Doctor, cl.	1 00
...on's Treatise on Milch Cows. cl.	60
...w on the Horse, 8mo.	2 50
...tt & Martin on Cattle, 12mo	1 25
...tt & Spooner on the Horse	1 25
...'s Cattle Doctor, 12mo	1 25
...r's Farriery, 12mo	1 25
...n's Stable Economy, 12mo	1 00
...on the Horse's Foot	50
...son on the Food of Animals	75
...and their Management by Mayhew:	63
...m on the Cow	25
...on Cattle	38
...on the Horse	25
...on the Sheep	25
...on Domestic Poultry	1 50
...on the Poultry Yard	25
...s and Rabbits by Delamee	25
...on the Pig	25
...ngault's Rural Economy	1 25
...s Muck Manual	1 00
...'s Agricultural Chemistry	38
...on's Agricultural Chemistry	1 25
...on's Elemens	1 00
(R. S.) Hints for Farmers	25
...on Farm Drainage, 12mo	1 00
...n Grasses	1 25
...uille on the Honey Bee	1 25
...ruit, Flower and Vegetable Garden	1 00
...an's Kitchen Garden.	60
Family Kitchen Garden	75
...en's American Kitchen Gardener	25
...' American Fruit Culturist	1 25
... Pear Culture	1 00
...n the Fruit Garden	1 25
...merican Fruit Book	50
... the Grape Vine	1 00
...a's Grape Grower's Book	50
...s on Graperies	1 25
...' Orchard House	40
...on Strawberry Culture	60
...lower Gardener's Directory	1 00
Flower Garden	1 00
...'s Lady's Flower Gardener	25

...f these Books can be sent by Post to ... of Canada, upon remitting the price ...he rate of 20 cents on the Dollar for ...

...Feb. 28, 1962. 4 t.

FOR SALE.

...T of thorough bred improved Berkshire ...s of various ages.

R. L. DENISON,
Dover Court.

... Aug, 1861.

BOARD OF AGRICULTURE.

THE Office of the Board of Agriculture has been removed to 188 King Street West, a few doors from the late location adjoining the Government House Agriculturists and any others who may be so disposed are invited to call and examine the Library, &c., when convenient.

HUGH C. THOMSON,
Secretary.

Toronto, 1861.

Notice of Partnership.

THE Undersigned have entered into Partnership as Seedsmen and dealers in all kinds of Agricultural and Horticultural Implements, under the firm of James Fleming & Co.

JAMES FLEMING,
GEORGE W. BUCKLAND.

NOTICE.

JAMES FLEMING & CO., Seedsmen to the Agricultural Association of Upper Canada will carry on the above business, wholesale and Retail, at 126 Yonge-st., 4 doors North of Adelaide-street, until next July, when they will remove to the new Agricultural Hall, at the corner of Queen and Yonge-streets.

JAMES FLEMING will continue the business of Retail Seedsman and Florist at his old stand, 350 Yonge-street.

Toronto, January 1st, 1861.

FOR SALE.

AT

WOODHILL, WATERDOWN P. O.

MR. FERGUSSON expects to have several *pure Durham bull calves* to dispos of next Spring, 1862, not intending to raise any this season. These calves will be all of the *well known DUCHESS tribe*, and will be put on the G. W. R. R. at six weeks old for eighty dollars each.

N. B.—Frst come, first served.

Waterdown, Nov. 14, 1861. 4—t.

THOROUGH BRED STOCK FOR SALE.

THE SUBSCBIBER has for Sale Durham and Galloway Cattle, male and female: Leicester, Cotswold, and Lincolnshire Sheep, male and female.

January 1, 1862. JOHN SNELL,
tf. Edmonton, P. O., C. W.

Contents of this Number.

The Agriculturist,

OR JOURNAL AND TRANSACTIONS OF THE OF AGRICULTURE OF UPPER CA

IS published in Toronto on the 1st each month.

Subscription—Half a dollar per Single copies; Eleven copies for Fi Twenty-two copies for Ten Dollars,

Editors—Professor Buckland, of College, Toronto, and Hugh C. Th tary of the Board of Agriculture, whom all orders and remittances dressed.

Printed at the "Guardian" Steam Street East, Toronto.