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VOL. II. HALIFAX, N. S., NOVEMBER---DECEMBER, 1875. No. 117.

HALIFAX, 31st December, 1875.

The rapid progress of Improved Agriculture during the present century, both in European and American countries, has been intimately related to the development of our modern systems of Agricultural Exhibitions. In Germany, where the whole population who need the instruction are systematically taught scientific and practical Agriculture from their earliest years, we have necessarily the most perfect cultivation of the soil, independent of any influence that Exhibitions might exert; but everywhere else Improved Agriculture embraces the improvement of stock as well, and it would be a hard thing for the farmers of any country to try to improve their stock without the facilities which Exhibitions afford. It is true that, both in England and America, the smaller local Exhibitions have been often the mere blossoming out or fruitage of a better Agriculture in the district. But, to a very large extent, Exhibitions generally are to be regarded as the great incentive to Improvement, and actually its most active cause. The real object of the Improver in this as in other Industrial Arts—the making of more money—the attainment of a more profitable system—is best brought home to his fellows, the Farmers, and those classes of the community whose sons are likely to become farmers, by the actual results which an Exhibition displays. Agricultural Colleges, Agricultural Papers, Agricultural Clubs, are all important and efficient means of Improvement, but an Exhibition tells, not only upon those who go to hear lectures, or who read agricultural papers, or who speak or listen at a Club meeting, but upon every class of the community. It gives the Exhibitor

an honest pride in his farm, his animals, his productions; it begets in the public mind a respect for Agricultural pursuits, and it spreads an interest around them that before the world knew not of. If a farming people are backward in adopting novelties, whether in the way of machinery, or modes of culture, or methods of feeding, or of utilizing farm products, an Exhibition is the very best means that can be devised, not only of telling them in what way to improve, but of showing how the improvement is to be done, and what the results will be after they do it.

What has proved to be the case in, we believe, every other country, is showing itself to be true likewise in Nova Scotia. The Resolutions passed by the Board of Agriculture last winter, the Report of the Agricultural Committee of the House of Assembly, and the approval of their recommendations by the Legislature, were all, in effect, a declaration of belief that our Agricultural Industries could not be satisfactorily developed without a system of Annual Provincial Agricultural Exhibitions.

The Resolution of the Board was:—“That, in addition to the sum annually voted for agricultural purposes, a further sum of \$4000 be annually given as a prize fund for a Provincial Agricultural and Industrial Exhibition, to be held under direction of the Government and Board of Agriculture, in any County, selected by the Board, in which an Agricultural Society, or other responsible body, shall be prepared to furnish suitable Exhibition grounds and buildings, and shall be willing to undertake the necessary expense attending the management of such Exhibition,—the Managers to collect a small

entrance fee from visitors, and from each Exhibitor, to go towards defraying the general expenses.”

The Agricultural Committee of the House of Assembly reported as follows to the Legislature:—“Your Committee recommend that for the better encouragement of Agriculture, an Agricultural and Industrial Exhibition be held annually on the plan suggested by the Board, for which purpose a sum of four thousand dollars will be required. First Exhibition to be held in the autumn of 1876.”

On the 14th of May, in the House of Assembly—

“Mr. Archibald moved that the Report of the Committee on Agriculture, presented on the 28th day of April last, be adopted by the House; which, being seconded and put, passed in the affirmative.

“Ordered, accordingly, that such Report be adopted.”

We have now placed the whole matter before those whom it may concern, viz: our readers, the Members of the various Agricultural Societies throughout the Province. Our quotations show that, severally, the Legislature and the Agricultural Board have each done their part, so far, towards the establishment, on a satisfactory basis, of a system of Annual Exhibitions. We may depend upon the Government carrying out their views. What is now required is activity on the part of Agricultural Societies or similar local bodies willing to take up the offer that has been made, and prepared to carry the scheme into actual operation. The first Annual Exhibition is fixed for the autumn of 1876. What preparation is being made for it? Intending Exhibitors are already looking for the Prize List be-

fore they order their spring seeds. But, before any Prize List can be issued, the place of Exhibition must be fixed, and many other arrangements made. The Board must be satisfied, before fixing upon a locality, that the parties offering are willing and able to erect suitable buildings, and to carry out the necessary arrangements to the satisfaction of other Counties, and that, over and above legal guarantees, there is a fair prospect of their doing so.

It appears as if there would be several Candidates in the field for the first Exhibition. Both Colchester and Halifax Counties have given notice of their readiness to undertake the responsibility; but, so far as we know, no definite scheme has as yet been offered for the consideration of the Board. In Halifax there is a proposal for the establishment of Exhibition Halls and Grounds, on a grand scale, in connection with a Driving Park, a scheme that seems to have the vital germ within it of prospective commercial profit, and which may, therefore, be expected to commend itself to the attention of capitalists. King's County may be inclined to dispute the claim of Colchester or of Halifax to be considered the Agricultural centre of the Province. If so, let King's bring forward their offer. We know that the Yarmouth County Society obtained an Act of Incorporation last year, to enable them to hold property, so as to acquire Exhibition grounds, but we do not anticipate any application from that quarter at present. Lastly, the County of Annapolis has taken measures to raise Exhibition Buildings in what seems to be a very sensible and simple and effective way. We do not know whether Annapolis has any intention in relation to the first Exhibition. The appended correspondence with that County will show, however, that there is a serious determination to have the Exhibition there before long. We have now given all the information of which we are possessed, and commend the whole subject to the earnest consideration of the Members of every Agricultural Society in the Province. Delay in the preliminary work was the terrible evil we had to contend with, both in 1868 and 1874, and now we are within a year's time of our next Exhibition, with, so far as is known to us, really less preparation than at the corresponding time prior to either of those Exhibitions. Until arrangements are definitely fixed and published all over the Province, it is vain to attempt to stir up the enthusiasm of Exhibitors, and if that is not done before seed time we shall have a repetition of the sorry show of roots and vegetables that marked the Exhibition of 1874. Neither can we expect the Fruit Growers' Associations, the Poultry Clubs, the Horticultural Societies,

or any other bodies or private individuals, to come forward with offers of Prize Lists or additional prizes until preliminary arrangements have assumed some definite form.

CLERK OF THE PEACE OFFICE,
Bridgetown, Nov. 19th, 1875.

PROFESSOR LAWSON, Sec'y. Central Board of Agriculture, Halifax,

SIR,—In pursuance of an order passed at the October Term of Sessions last past, I have the honor to forward to you a copy of a resolution passed at the said Term in reference to the erection of a suitable building in the County of Annapolis for the purpose of holding Agricultural Exhibitions.

I have the honor to be,

Sir,

Your obedient servant,
J. G. H. PARKER,
Clerk Peace.

[A TRUE COPY.]

ANNAPOLIS S. S., GENERAL SESSIONS OF
THE PEACE, OCTOBER TERM, 1875.

Whereas, it has been brought to the notice of this Court that the Central Board of Agriculture have offered inducements for the several Counties to erect buildings for the purpose of Agricultural Exhibitions.

And Whereas, the County of Annapolis is largely interested in the varied Agriculture, Horticultural, and other industries of the County, this Court earnestly recommend to the attention of the Legislature the necessity for an Act based upon such Resolution.

And Whereas, a Petition, signed by the Agricultural Societies and leading inhabitants of this country, is addressed to this Court (said Petition hereto annexed) asking for a sum of money to be assessed and collected for such purpose; and the Court deciding they have no power in the premises without Legislative enactment, yet willing to aid the Central Board (so far as they legitimately can.)

Do hereby Resolve, That this Court strongly recommend the prayer of said Petition to the favourable consideration of the Legislature, and that the Clerk of the Peace be directed to send a copy of this Resolution to the Secretary of the Central Board of Agriculture.

By the Court,

J. G. H. PARKER,
Clerk Peace.

IN New York State, in 1874, a hundred and seventeen butter and cheese factories used up the milk of 36,429 cows. Milk received, 59046½ tons, or at the rate of 3242 lb. of milk per cow (387 gallons). Average of cheese per cow, 331 lbs. Average amount of milk required for 1 pound of cheese, 10 lbs. nearly.

Foot and mouth disease is still exercising European farmers. Cow-pox is now brought forward as a preventive. M. Feizet, of Elbeuf, has during the last four months, vaccinated 30 oxen. Jenner believed that cow-pox was a preventive against the distemper in dogs. At one time it was also a belief among English sportsmen, but has been long exploded. Probably M. Feizet does not know this.

—According to the *St. John Telegraph*, New Brunswick, last year, exported enough deals to "make a plank platform 10 feet wide from St. John to Liverpool, and a thousand miles beyond it." It is not said when the platform will be ready for use.—England at present pays 80 millions of pounds sterling to the farmers of other countries for produce, and England is still as hungry as ever, and like her own little workhouse boy, asks for more.—A number of Long-horn breeders met in Birmingham on 29th November, to establish a Herd Book of that breed.—

The time for receiving pedigrees for the 15th vol. of the American Short Horn Herd Book closed on Christmas day.—

The Fruit Crop in England occupies 145,622 acres of land; this is exclusive of gardens. In Devonshire alone there are 24,312 acres of orchard. We confess that Nova Scotia is not the "greatest"

fruit country in the world, but we grow the best apples notwithstanding.—The latter part of November was a trying time in Halifax for conservatories and other plant houses, as well as for cellars, and a good many plants were destroyed by the low temperatures so unusual at that early period of the winter.—Nova Scotia Cattle will be represented at the Philadelphia Exhibition by Short Horns, Devons, Ayrshires and Jerseys or Alderneys; the Devons may be more numerous than any of the others, as we have more of them, and attention has been longer paid to their breeding.—The Ellesmere Pigs at Mount Hope are beauties without paint or printer's ink. We heard the other day that orders had been received for all the first litter at ten dollars a piece, but who, out of the Asylum or in it, knows when the first litter is to come. The complaint is that stinting them of food does not prevent their getting remarkably fat.—

J. E. Starr, Esq., of Starr's Point, Cornwallis, went to England by last steamer. We hope to see him accompanied, on his return, by some choice Short Horns.—The Building between Bedford Basin Bridge and Tolson's Mill is not a new church, nor a school house; it is a Fish House for the hatching of Salmon Fry. It has now been occupied, and the hatching in operation, for some time, and with every promise of success.—Gentlemen who wish to establish a permanent interest in the Fruit Growers' Association of Nova Scotia may do so now by paying

ten dollars for a Life Membership to D. Henry Starr, Esq.—Cawood's Rose, the "big cow" of Lucyfield, brought a heifer calf on 24th November. The calf is pure white, like her sire the famous Captain Tregunter, and like her full sister (Cawood's previous calf by Capt. Tregunter) which was sold to the Earl of Beattie for 100 guineas.—At a Kentucky sale in October a "three year old calf" was sold by Broom & Sons to Spear & Son of Illinois, for 3150 pounds sterling. The purchasers have since resold her to a Mr. Fox for 3960 pounds. Her name is 2nd Duchess of Airlie. It a "three year old calf" is a calf at all, this one is surely a golden calf, or else a goose that is expected to lay golden eggs.—Dwarf Phloxes are coming into fashion in England. They are quite hardy in Nova Scotia; let us make our flower gardens fashionable too.—Many persons have offered advanced prices for the animals sold at Parker's stables on 10th November, but no purchaser has offered back his purchase at the original price.—Mr. Goldie, of Guelph, Ontario, a well-known zoologist and botanist, whose father discovered the finest of all North American Ferns, *Aspidium Goldiannum*, (to be seen in Mr. Barron's greenhouse), has been spending some time in Halifax, on business, and embraced the opportunity to visit some of the interesting zoological and botanical localities of the district.—The dullness of all other kinds of business is naturally turning the attention of our young men to Agricultural pursuits. To a man who likes it, and who has sufficient capital to make a fair start, and sense enough to manage it like any other business, farming is sure to be profitable and pleasant. But where there is a want of capital, or a want of sense, or a dislike to the pursuit, it cannot be expected to be either pleasant or profitable.—The most interesting botanical discovery that has been made in Nova Scotia for many a year is that of Robert Morrow, Esq., who has obtained the splendid evergreen *Rhododendron maximum* from the wild country in rear of Sheet Harbour. It is a magnificent plant, growing to the height of ten, fifteen, or even twenty feet, and keeps its bright green leaves all winter. Mr. Morrow has a living plant in his charming little conservatory at the North West Arm. We understand that Mr. Jack also has a plant, somewhere about Sheet Harbour, waiting for the opening of Spring, to be transported to the city. Mr. Morrow has, in his grounds, several trees of the rare *Pinus Banksiana* (Sir Joseph Banks's Pine) obtained on the rocky grounds near the North West Arm, where it grows perfectly wild, being an indigenous plant. This is the conifer that reaches nearest to the north pole.—The Secretary of the Board of Agriculture

brought from Europe some live stock that were not embraced in the resolution of the Board, viz: Edible snails of the identical species used by the old Romans and by modern Frenchmen, called by zoologists *Helix Pomatia*. The snails are being fed on apples and oatmeal during the winter, and will be turned out into the woods in spring-time to increase and multiply. On the Thuringian hills where they were obtained, the winter is nearly as severe as in Nova Scotia. Epicures may look forward to a feast of snail-flesh.—We learn that Princess Mary, served by Cambridge Barrington, and respecting whom doubts were expressed at the sale on 10th November, is certainly in calf. There is now every reason to believe, also, that Polly Vaughan is in calf to Gwynne of the Forest, which nobody seems to have believed at the time of sale.—The Ayrshire Belle of Avondale's Heifer Calf is thriving nicely as might be expected under the care of her owner, Alex. Anderson, Esq., and promises to make a neat Cow. Belle herself looks more blooming than ever.—Some Secretaries of Societies and others, when they write to the Secretary of the Board on business, add a few items of news relative to the live stock in their district, or whatever else calls for remark. If our correspondents generally were to do so, we should be able every month to tell all the farm news of the whole Province.—The Union Society of East Cornwallis, has resolved to raise the annual subscription of members to four dollars.—Farmers requiring Ram Lambs will find some nice Hampshire Downs at Mr. John McDonald's Farm, Shubenacadie; they were raised by himself from a Ram imported by the Board some years ago, and are offered at a low price.—We hear that the Wild Eyes Short Horn Bull Baron Lightburns, has risen considerably in estimation since he went to Cornwallis. He was sold for a hundred and seventy dollars, but we suspect he could not be bought back again for seven hundred.

THE following Nominations to the Central Board of Agriculture by the officers of Agricultural Societies, have been received:—

- District No. 1. County of Halifax.*
 Halifax County Agricultural Society, Col. J. Wimburne Laurie, Oakfield.
 Lower Musquodoboit Agri. Society.
 Upper Musquodoboit Agri. Society, Col. Laurie.
 Salmon River. Beaver Harbour, Agricultural Society, Colonel Laurie.
- District No. 2. King', Annapolis, Digby.*
 Union Agri. Society of East Cornwallis, John E. Starr, Starr's Point, Cornwallis.
 King's County Agri. Society, Lower Horton, J. E. Starr.

- Aylesford Agri. Society, John E. Starr, Starr's Point.
 Central Agri. Society of King's County, John E. Starr, Starr's Point.
 West Cornwallis Agri. Society.
 Eastern Annapolis Agri. Society, W. E. Starratt, Paradise.
 Bridgetown Agri. Society, W. E. Starratt, Paradise.
 Paradise Agri. Society, W. E. Starratt, Paradise.
 Township of Clements Agri. Society, W. E. Starratt, Paradise.
 Annapolis Agri. Society, James Horsfall, Annapolis.
 Port Williams, Ann., Agri. Soc'y, W. E. Starratt, Paradise.
 Digby Central Agri. Society.
 Weymouth Agri. Society.
 Clare Agri. Society, John Dakin, Digby.
 Union Agri. Society of Digby. St. Mary's Bay.
- District No. 3. Lunenburg, Queen's Shelburne, Yarmouth.*
 Mahone Bay Agri. Society.
 Mutual Benefit Agri. Society of Queen's, North Queen's Agri. Society, Caledonia, C. E. Brown.
 Kempt Agri. Society of Queen's County.
 Shelburne Agri. Society, Chas. E. Brown, Yarmouth.
 Clyde River Agri. Society.
 Barrington Agri. Society, Chas. E. Brown, Yarmouth.
 Barrington West Passage Agri. Society, Chas. E. Brown, Yarmouth.
 Yarmouth County Agri. Society, Charles E. Brown, Yarmouth.
 Yarmouth Township Agri. Society, Chas. E. Brown, Yarmouth.
- District No. 4. Hants, Colchester, Cumberland.*
 Windsor Agri. Society, William H. Blanchard, Windsor.
 Fenwick Agri. Society of Noel.
 Nine Mile River and Hardwoodland Agri. Society.
 Newport Agri. Society.
 Union Agri. Society of Hants County, Maitland.
 Upper Nine Mile River Agri. Society, Samuel Blois.
 Enfield Agri. Society.
 Onslow Agri. Society, Israel Longworth, Truro.
 Shubenacadie Agri. Society.
 Lower Stewiacke Agri. Society, Israel Longworth, Truro.
 Tatamagouche Agri. Society, Wm. Blair, Onslow.
 Stirling Agri. Society of New Annan, Israel Longworth, Truro.
 Brookfield Agricultural Society.
 Earltown Agri. Society.
 Parrsborough Agricultural Society, Israel Longworth, Truro.
 Malagash Agri. Society.
 Minudie and Barronsfield Agri. Society



Wallace Agri. Society, T. M. Morris.
 Union Agri. Society of Pugwash, Israel
 Longworth, Truro.
 Scotia Agri. Society of Fox Harbour, I.
 Longworth.

*District No. 5. Pictou, Antigonish,
 Guysborough.*

Pictou Agri. Society, David Matheson.
 Pictou.

River John Agri. Society.

Egerton Agri. Society.

Morignomish Agri. Society, D. Matheson,
 Pictou.

Millbrook Agri. Society, David Matheson,
 Pictou.

Morristown Agri. Society.

St. Andrew's Agri. Society, John A.
 Chisholm, St. Andrew's.

Arisaig Agri. Society.

Guysborough Agri. Society, William
 Hartshorne, Guysborough.

Milford Haven Ag. Soc'y, T. W. Ferguson.

Glenelg Agri. Society, Cross Roads, St.
 Mary's, David Matheson. Pictou.

*District No. 6. Cape Breton, Richmond,
 Inverness, Victoria.*

Boularderie Agri. Society, John Ross,
 Grove's Point, Little Bras d'Or.

Sydney Mines and Little Bras d'Or Agri.
 Society, John Ross, Grove's Point,
 Boularderie.

North Sydney Agri. Society, John Ross,
 Grove's Point.

Mabou and Port Hood Agri. Soc'y, J. Ross.

North East Margaree Agri. Society.

St. Ann's Agri. Society, David McCurdy,
 M. P. P.

Middle River Agri. Society, John Ross,
 Grove's Point, Little Bras d'Or.

THE operations of our neighbors in New Brunswick, in the way of Agricultural Improvement, are not without interest to us. It has happened before now that we have borrowed ideas from them, and maybe that they have borrowed ideas from us. The agricultural conditions of that Province are more nearly similar to our own than those of any other Province of the Dominion, and the similarity is not confined to soil and climate, but extends to markets, prices, facilities for transit by sea and land, and other obvious conditions affecting the practice of agriculture. For this reason it behoves us to keep an eye upon the sister Province, to watch the efforts that are being made by the Legislature and the farmers themselves to promote and extend her agricultural prosperity, to ascertain how far the modes adopted are successful, and wherein they fail, and to apply all the knowledge of observation and experiment thus obtained to the development of the agriculture of our own Province. It is for this reason that we have frequently, on former occasions, devoted portions of our JOURNAL to details of operations in

New Brunswick, and it is for the same reason that we now ask the attention of our readers to a summary of the Rules and Regulations made under the new Agricultural Act of that Province, and recently published in the *Royal Gazette*. In the following outline we endeavour to indicate as briefly and clearly as possible the essential features of these Rules and Regulations.

Provision is made for the formation of Agricultural Societies, with objects similar to our own. The minimum number of Members is forty, minimum of aggregate subscriptions sixty dollars, the amount of individual subscriptions not limited in any way; but no Society can go into operation without sanction of the Governor in Council; it then becomes a corporate body. No more than four Societies can be formed in one County.

Such Societies receive annually, as a bounty, treble the amount of their subscriptions, no County, however, receiving a greater sum in the aggregate than \$800 in any one year. The amount to be drawn by individual Societies is limited to \$180, except where there is only one Society in a County, in which case it may qualify for receiving \$600.

In any year in which it may be considered advisable to make a Provincial Importation of Stock, the Governor in Council may retain half of the grant of each Society to supplement the fund for the purchase of Stock. A Society purchasing at the sale of Imported Stock is allowed credit on such purchase to the extent of the sum retained, but, if a Society fail to purchase, the sum retained (or the balance over the purchase) is forfeited. On sufficient cause shown, the Governor in Council may relieve a Society from such forfeiture.

In the disposal of seeds, stock, implements, or other property imported by any Agricultural Society, such articles are not to be sold for less than their true cost and charges, unless at public auction, of which at least seven days notice has been given by public advertisement, at which all persons present have a right to bid, whether Members of the Society or not. The Secretary of each Society is to indicate three public places in the Parish or District where notices are to be posted.

The Accounts are to be certified under oath of the Treasurer. Each Treasurer is to give a Bond to Her Majesty the Queen, to the extent of double the amount of Grant, which is to be forwarded to the Secretary for Agriculture.

The Secretary of every Society is required to furnish an Annual Report under the following heads:—

Name and extent of District included in the following Report.
 Character of past Season,

Character of Soil of District,
 Principal Crops of District,
 Average produce of Wheat per acre,
 Quantity of Wheat raised the past Season,
 Name of principal varieties raised,

Corn,	same as for Wheat,	
Oats,	do	do
Rye,	do	do
Barley,	do	do
Peas,	do	do
Beans,	do	do
Buckwheat,	do	do
Hay,	do	do
Clover Seed,	do	do
Timothy Seed,	do	do
Potatoes,	do	do
Turnips,	do	do
Mangle Wurzel,	do	do
Carrots,	do	do
Fruit,	do	do

Names of principal breeds of Horses,
 Names of principal breeds of Cattle,
 Quantity of Butter and Cheese produced,
 Breed of Sheep and quantity of Wool,
 Breed of Pigs and quantity of Pork,
 Poultry,
 Remarks and suggestions.

The amount of premiums awarded by Societies is limited to double the amount of subscriptions for the year. Premiums are confined to the following schedule:—

Horses, Cattle, Sheep, Swine, Poultry;
 Grain and Seeds of all kinds; Roots,
 Fruits;

Horticultural Produce; Dairy Produce;
 Flour and Meal;

Domestic Manufactures in Woollen; Cot-
 ton, Linen, and Ladies' fancy work;

Improved Implements of Husbandry;
 Best system of Culture; Manures and
 Composts;

Improvements in Farm Buildings and
 Farm arrangements;

Ploughing matches.

All Stock purchased by any Society is to be sold within fourteen days after arrival in the District, either at private sale for not less than cost and expenses, or at public auction to the highest bidder, (of which at least seven days notice is to be given), under such conditions as the Society may deem just, except in the case of Stallions and pure-bred Bulls, which may be retained, provided their services are sold at public auction within fourteen days after their arrival in the District, with like notice, with such restrictions as are just; or should any Society hire the use of any animal for breeding purposes, he shall be of some well established breed, and his services shall be sold in like manner, and a full and particular account rendered to the Secretary for Agriculture as soon after as convenient; but in no case are animals other than imported to be purchased or hired which are already in the County in which the Society is located, or the adjoining County.

EVERY effort should be put forth to promote Agriculture in this Province, and also the numerous branches of Industry related to Agriculture. There is, for example, the Artificial Manure Manufacture. Around our shores there are no doubt large quantities of useful material annually running to waste. Mr. Vice-Consul Crowe's Report on the Norwegian Fisheries for 1874, offers some suggestive hints as to the uses to which the refuse of codfish may be applied. In Norway this refuse is converted into Artificial Guano.

It appears that this special manufacture has now become an important article of export, exceeding in value the export of ice-packed fish to England, and it is said to have such good prospects for future development that, ere long, it is not improbable that the annual export from Norway will exceed a value of 1,000,000 Spanish dollars. In 1872 two guano factories had been started, since which time seven more have been erected. These are all in operation, utilising the refuse of the cod; but one factory has been established for transferring into guano the refuse of the whale. "The raw material annually consumed by these factories now amounts to about 15,000 [?] tons of] fish-heads and backbones. Although the prices for fish-heads have risen in later times, from a trifle to 10½d. for a hundred, and from 1s. 5½d. to 1s. 10d. for a similar quantity of dried heads, the supply has sometimes been rather scanty. The reason assigned is, that fish-heads have hitherto been used among the common people as a substitute for winter fodder for the cattle. It is estimated that the cattle in the fishing districts consume about 10,000,000 of cods' heads annually. On visiting one of these guano factories, the first thing that attracts the attention is the accumulation of the raw material, consisting principally of dried fish heads and backbones in millions. In the factory itself one observes, in the first compartment, some large iron plates and stone slabs with furnaces underneath. On these plates the raw material goes through the drying process preparatory to ulterior operations. Although previously dried in the air, they have to be submitted to this additional drying process before being ground. A series of wooden shovels fixed over the pans, and set in motion by mechanical means, keep constantly stirring the material to prevent its burning. When thoroughly dried, the raw material is brought to the mill, and placed between the discs, furnished with sharp steel knives, rotating over each other, so as to tear the heads and backs into shreds. The raw material, after having gone through this process, is then brought to a common coarse mill, from whence it issues

as a homogenous coarse powder, which is then weighed into sacks holding 1 cwt. and stored ready for sale. Another novel and remarkable article, prepared from fish, viz., fish-flour, has been brought forward in the last few years. It is not as yet manufactured in any great quantity, as the article is still new in the market, and consequently there is no great demand for it. The flour is prepared from dried fish of the first quality; it is thoroughly desiccated, and then ground in a mill. There are two qualities—coarse and fine ground. It is especially the former which has found favour with the public, from which an excellent dish of preserved fish can in a short time be prepared; while the finer flour is used for fish puddings, a dish highly appreciated in Norway. To those who have no regular supply of fish, it is presumed this article will be more particularly important. Nova Scotia might supply the West India market.

WE have already seen some indication of a benefit to be derived from the dark cloud of "hard times" that has been hanging over us. Whatever may be the cause of all the financial difficulties and the comparative stagnation of manufacturing and mining industries, the unprofitableness of fishing, and the depreciation in freights,—one circumstance forces itself upon attention everywhere, whether in Nova Scotia or Ontario, or the United States, viz.: that wherever dependence has been placed upon Agriculture there has been no falling off. Crops have been good, prices are fair, and farming communities are everywhere enjoying ease and comfort. Now this should have the effect of turning the attention of young men to Agricultural pursuits, and of leading capitalists to enquire whether their money may not be as safely and as profitably invested in Agriculture as in any other Industry. With proper education and sufficient capital there is no pleasanter pursuit, and there is no branch of Industry that yields a more certain profit. It is true that the profits are not large in proportion to the capital employed, but neither are the risks. Compare the following account of the cheering state of matters in one of our own agricultural districts, (which we copy from the *Amherst Gazette*) with the dismal prospect that has lately been presented in some commercial communities, and in country districts dependent upon lumbering, &c.:—

"The fine weather and good roads of the past few weeks, have given quite a stimulus to all branches of business. Farmers have been busily employed in removing their hay from the marshes, and bringing their produce to market; indeed, the casual observer, noticing on our streets the loads of hay, the sleds piled up with

pork, butter, &c., and the large quantities of goods being removed from the several stores, would think it all a mistake about "times" being "hard."

"During the past season our farmers have gathered excellent crops, which are being disposed of at remunerative rates, our mechanics are all busily employed, laborers find employment, yet shopkeepers complain that they cannot collect overdue accounts, and have difficulty in getting money to meet their liabilities, which are sharply collected. The country will soon have to learn that the old-fashioned system of long credits will not suit the new style of doing business, and will have to pay more promptly.

"Our farmers complain of hard times more from a chronic habit than from any real cause. Indeed, we do not see how they can expect better crops or much better prices than the present year affords. Money is not as plentiful or prices as high as when the Intercolonial Road was being built; but that being completed, and no public work of equal magnitude being in prospect, we could not look for a continuance of such prosperous times.

"It is a little singular that in no year in the history of Amherst have there been so many buildings, and expensive ones, as during the present, and from what we learn the building business will be very brisk in the coming year.

"The principal business in this county is Agriculture, and with good crops and comparatively good prices, the county may safely be reported as in a healthy state,—and, with the evident revival of trade which must soon be experienced, we may expect to see all other branches of business equally prosperous with that of the farmer."

We hear that in the United States, it is the great grain growing and cattle grazing States that are now being looked to to lift the manufacturing and commercial communities out of their distress. The farmers are rapidly becoming the great power in the land, and the holders of the national wealth. Let us take a lesson from all this in time.

THE Lower Stewiacke Agricultural Society have purchased from the Asylum at Mount Hope, Dartmouth, a White Boar, about a year and a half old, which is considered a very fine animal. He is believed to be out of a Sow imported by the Board of Agriculture from Western Canada, of the Large Yorkshire breed, and by a white Chester Boar, one of the stock purchased by the Board at an earlier period, from Mr Cochrane, of Compton, Quebec. Notwithstanding the repeated importations by the Board, there is not now, it is believed, a single thorough-bred Pig in the Province, with the exception of those of the recent Im-

portation from England. Some pork raisers prefer the White Chesters, but there is not now a White Chester to be found in Canada. We hope the same thing will not have to be said of the Ellesmeres and Royal Berkshires ten years hence. Let every one who raises pork strive to obtain one or other of these breeds, and perpetuate it in its purity. Every Society in the Province should secure at least one Boar.

RECENT experiments at a Creamery in Oneida County show that the morning's milk is richer in cream than the evenings. Another deduction from these experiments is, that the shorter the interval between milkings the richer the milk in cream or butter,—this being accounted for by a theory that after the udder is filled there sets in dissipation of the fatty matter. How much of the greater richness of the morning's milk is due to the cool and quiet surroundings of the cow during the night, as compared with the heat and annoyance under which secretion goes on in day time, has not been determined. It is obvious, however, that frequent and regular milking is of the greatest practical importance. Where it can be done the English practice of milking three times a day should be adopted; to realize the full benefit from cows in really good cultivated pasture this practice is an absolute necessity. Where, however, they range through wild Nova Scotian woods, and have never been taught to come home except at night, the common method of milking morning and evening is the only practicable one.

THE Herd of Mr. William Smith Cragg, Arkholme, Lune Valley, North Lancashire, England, near Arkholme Station (of Furness and Midland Line) is described by the Editor of the *London Agricultural Gazette* as follows:—"This Herd does not appeal to fancy breeders at all; but we are assured that, 30 years ago, really good cattle were bought, and that to these the best available sires have been put, and that the stock has good local reputation, and wins favour from the butcher and the dairyman. And it must be said that to win a local reputation in this district, is no trifling feat. It is a neighbourhood where almost all the cattle are good, and almost every occupier of land is a painstaking breeder. No spot in England has enjoyed greater advantages, or made better use, for years, of the opportunities it has had."

From this Herd were purchased, for Nova Scotia, the splendid Bull Captain Cawood, who went to Shubenacadie, and Princess Mary (in calf to Cambridge Barrington) now the property of C. F. Eaton, Esq., Cornwallis. The largest and finest ♂ of the whole Herd was Cawood's Rose, now at Lucyfield Farm, Old Windsor Road.

THERE are two thousand sheep-devouring wolves in France; let us not complain of a bear now and then.—Peruvian Guano, so highly prized at one time as of constant composition, is now found to be of uncertain quality, varying in value to the extent of from 15 to 25 dollars per ton.—Sutton's Golden Tankard is said to be the richest Mangel for feeding cattle: it does not grow large, and is grown rather close in the drill to keep down size and increase its nutritious qualities.—Steam ploughing in Europe is rendering draining unnecessary.—The onion crop this season is the largest ever known in the United States, but it brings no tears of joy, for the odorous bulbs sell in Philadelphia wholesale at 50 cents a bushel.—In the case of the King of Portugal *versus* Carruthers, it has at last been decided that the King is entitled to Dr. Welwitsch's "study set" of Portuguese Plants, the next best set to be placed in the British Museum.—*Adiantum Fairleyense* does not come true from spores or seeds.—There is some talk of introducing English pheasants and sparrows.

THE Members of the Pictou Agricultural Society are so much pleased with the imported stock purchased for them by Mr. Matheson at the Board's sale, that they have agreed to double their subscriptions. The Members of every Society in the Province may safely follow the example, and double their subscriptions, with personal advantage to themselves and their families, and great benefit to the Province at large.

IN reference to the Edible Snail (*Helix Pomatia*) spoken of elsewhere in the present number, we are indebted to the kindness of the Rev. W. E. Wilson, Rector of Sackville, N. S., for the following translation of an Anecdote of Sallust:—

ABSTRACT OF SALLUST BELLUM JUGURTHINUM, 92, 93, 94.

Marius was anxious to capture a certain stronghold of Jugurtha's situated near the river Mulucha (now the Malwa in Morocco), in which all the treasures of the King had been deposited. This fortress, however, appeared inaccessible, by reason of the precipitous slopes which surrounded it, until by chance a way was discovered to it on this wise. A certain soldier of the Roman auxiliaries, Ligus by name, wandered from the camp in search of water, until he approached the side of this fortified hill. Here he noticed some snails crawling among the rocks (*cochleas** *inter saxa repentes*), and, picking one and then another, and looking for more, he was led on until he emerged at the summit of the hill, but in an exposed, untenanted spot at the rear of the besieged. Descending unobserved, he imparted his

discovery to Marius, who sent a band under his guidance and captured the place. This was one of those culminating successes of Marius which resulted among other circumstances in bringing on a termination to the Jugurthian War.

* *Cochlea*. A snail—such as *Hydraco* speaks of as being swallowed by the epicures of his day to tickle the jaded appetite after a debauch, applying an epithet to them which illustrates this passage of Sallust.

Jostis marcentom squillis recreabis et Afræ Potorem cochleæ.

("With broiled prawns or an African snail shalt thou refresh the seedy tippler.")—Sat. 2, 4, 58.

The snail was (according to our version) forbidden meat to the Jews.—*Leviticus* xl. 30. But the septuagint and Vulgate translate the Hebrew by *saura* and *lacerta* severally—Lizard, and are probably correct.

THE New York "Horticulturist" is now merged in the Philadelphia "Gardener's Monthly and Horticulturist." The combined Magazine will continue under the Editorship of Mr. Thomas Meehan, the Germantown Nurseryman, who has been so long and so favourably known as Editor of the "Gardener's Monthly."

FINE OXEN.—Mr. W. L. Piper, Nappan, sold his fine oxen last week to Mr. Dean, of St. John, who always picks up something choice for his customers in holiday seasons. These oxen were probably the heaviest and fattest ever fed in this county. Their weights were 2280 lbs. and 2070 lbs., and girths 8 ft. 5 and 8 ft. 1. They were raised by a Mr. King, of Mount Pleasant, in this county, and when four years old were bought by Mr. Pipes, who worked them for a year on his farm, and then commenced to fatten them. They were seven years old last spring. They are well mated and symmetrical in form, and have been much admired by judges.—*Amherst Gazette*.

It is so much cheaper and better, in every way so much more profitable, to feed Cattle of all kinds upon Koots than upon Hay, that we have, again and again, urged the propriety of our Farmers throwing their dependence more and more upon Root Crops. During the past Summer we paid particular attention to this subject, examining the crops everywhere in England and Continental Europe, so as to form a just comparison of them with those to be seen in well cultivated fields in Nova Scotia. The conclusion of the whole matter, so far as our comparisons went, was that there is no country better adapted for the cultivation of Roots than Nova Scotia. In Scotland we saw the most regular fields of Turnips, (in England they were burnt up), but none better than we have seen on Boularderie Island and in the County of Pictou; about Magdeburg, in North Germany, we saw the finest Mangels, where it was too hot and

sandy for Turnips to grow, but the Mangels even in that great centre of manure factories, were not better than we have seen on the Halifax Peninsula: about Leipzie (where the soil is heavier, much like our own) we found the most extensive cultivation of Roots of all kinds; but a Nova Scotian farm, with the same cultivation, would most certainly yield as large and as fine crops. We refer to this subject now in order to commend to the special attention of our readers an article of very great value which appears in the present number, and which, without some such indication, might be passed over as a mere piece of heavy reading, on a par with what scientific Professors are supposed to produce for the mystification of Farmers. The article in question is a complete treatise on Root Crops, by Professor Voelcker, in which the whole subject of their cultivation and comparative values under varied circumstances is dealt with in a masterly and thoroughly practical manner. We should like to have Dr. Voelcker's paper read at length before at least one Farmer's Club in every County of the Province, and its various points discussed by our Farmers. But, if that cannot be done, every Farmer can at least read it for himself and explain it to his boys, and talk over moot points with his neighbour of a long winter evening. Then, if any doubts arise, if any further explanation be wanted, if any position seems to be untenable, he can write a note or a post card to the Editor of the *Journal of Agriculture*, and we shall be glad to reply and explain as fully as possible in a succeeding number. Roots feed the cattle and the sheep, roots make beef and mutton and wool, roots furnish material for manure to fertilize the fields, root cultivation ameliorates the soil and extirpates weeds, roots bring money into the farmer's wallet, roots do just everything that is wanted to make farming pay. Every Farmer in Europe knows this, and yet every Farmer knows also that there it costs more to raise an acre of roots than the produce is worth after it is raised. This is the reason our people don't take to roots. Roots are a paradox, an enigma. Roots are only a part of farming. The "pay" in roots, is indirect, is derived from other crops: none the less certain, however; but that is a branch of the subject that we must work out arithmetically at another time.

The following notice from the *Journal of Horticulture* refers to a very neat, and, in every way, very remarkable plant, which we saw during the Summer, not only in the Rockwork at Kew, but in Mr. Bull's plant pits at Chelsea, and in several other public and private gardens in Edinburgh, Dundee and other places. It scarcely rises above the surface of the

soil, forming in fact a mere coating, like some flat lichen, and the fruit also has a resemblance to the apothecium of a lichen. Strange to say, (if we are not mistaken) the nearest affinities of this plant in botanical structure, are the buckwheats:

NERTERA DEPRESSA.—On the Rockwork of Kew there is a nice patch of the charming *Nertera depressa*. It is thickly studded with berries like of those *Solanum capsicastrum* reduced to the size of small peas. Though cultivated for the last five years, it seems only now to be receiving the favor it deserves. It is a native of bleak antarctic mountains, and, notwithstanding, grows rapidly and well in a forcing pit during the spring of the year, and may then be increased to any extent by means of the creeping rooting stems. In summer it does well in cold frames. It is known to some as *N. scapanioides*, which name was given by Lange in his seed catalogue of 1868. *N. depressa* is the oldest, and should therefore be upheld. It is found on the Andes from Cape Horn to New Grenada, on the Island of Tristan d'Acunha, and in New Zealand and Tasmania.

MILK FEVER OR "DROP AFTER CALVING."—Believing prevention to be better than cure, will you kindly allow me a little space to give my opinion. Many methods are advocated, but many of them seem contrary to nature, and in such we have no faith. Nature may be helped but not run against if any substantial good is to be the result. Our cows are kept mostly for butter making and cream, as we have a large consumption in the mansion. We have cows calving all the year round at the rate of two per month, and mostly all in high condition, and some milking as heavy as 22 to 24 quarts of milk daily. These we term good milkers even in Cheshire; and, having been uncommonly fortunate in our simple treatment, I thought it might benefit the country to make it public, seeing so many notes treating on the same disease. Our treatment is as follows:—Should the cow be at grass we bring her into the stall or loose box at night (the latter preferable), about three days before calving, and give her 1 pint best linseed oil. We let her go out all the day up till the very time of calving. When she calves we take 2 quarts of the beestings and leave the calf with the mother for two or three days, and we adopt the same treatment if we take the calf away when dropped. Ten hours after calving we take about 4 quarts, 10 hours after that we milk nearly clean, and the next meal as clean as you like. Our treatment in winter is the same, only give a little more linseed oil and watch the bowels, and especially if they have been eating much, give dry food. I

think the most dangerous time of the year is the months of March and April, not so much from milk fever, although called by that name, but through constipation of the bowels, the cold east winds being also very fatal at that season on cows newly calved. But such cases may be greatly averted by letting the cow calve in a loose box instead of being tied by the neck. If they do go down in the back, get a good sheepskin newly flayed and put along the cow's back and give a little opening medicine. Should any reader have faith enough to try the above simple treatment, by so doing his faith will be increased. — *W. Gray, The Roobery, Nantwich, in Agricultural Gazette.*

The Halifax County Agricultural Society is looking about for another Ayrshire Bull,—a match for Pictou Charlie, if such can be found. An order has been sent to Mr. Fleming, of Strathavon, to make a raid among his' neighbours Herds.

PHILADELPHIA INTERNATIONAL EXHIBITION, 1876.

CANADIAN COMMISSION—AGRICULTURAL DEPARTMENT.

Objects for Exhibition will be received at the various railway stations during the third week in March, 1876. Woods, grains, grasses, wool, flax, cotton, agricultural machinery, and all objects, *except* Fruits and other perishable articles and Live Stock, must be received at that date. Fruits will be admitted in their season. Models in plaster or wax may be substituted for tropical fruits. Vegetables and other perishable products will also be admitted in their season. Dairy products will be admitted during the period of the Exhibition.

Cards supplied by the Canadian Commission will be affixed to goods, stating the Exhibitor's name, address, and place of manufacture, class of objects, catalogue number, and price. Exhibitors' business cards, circulars, and samples, will be placed within their space for distribution, but visitors shall not be solicited to receive them. All products arriving at the doors of the building by rail, wagon, or otherwise, will be received by the Bureau of Transportation, and delivered on the space granted. The Canadian Commission will then unpack and arrange the goods without delay. Provision has been made for the removal and safe storage of empty boxes and cases immediately after unpacking.

LIVE STOCK.

The exhibition being open to the whole world, it is of the first importance we bring forward the best of their kind

only, as the character of our stock will be judged by the general average of those exhibited. The Commission will provide for transporting and feeding the stock.—All forage and other food will be furnished at depots conveniently located within the grounds. The Canadian Commission will furnish their own attendants, on whom all responsibility of the care of feeding, watering and cleaning the animals, and also of cleaning the stalls, will rest. Though the American Commission will erect ample accommodation for the exhibition and protection of Live Stock, contributors who may desire to make special arrangements for the display of their stock, will be afforded facilities at their own cost. All animals will be under the supervision of a veterinary surgeon appointed by the American Commission, who will examine them before admission, to guard against infection, and who will also make a daily inspection, and report. In case of sickness the animal will be removed to a suitable enclosure, specially prepared for its comfort and medical treatment. Rings will be provided for the display and exercise of horses and cattle. It is highly important that all who design exhibiting, should now make application, as the extent of preparation necessary can only be regulated by an estimate based upon actual demands. Imported cattle will be exhibited in the Canadian Department, if the property of a Canadian Exhibitor. Proprietors whose stock has not been selected, will be allowed to exhibit at their own cost, if space can be procured, and on the recommendation of the Advisory Board of each Province.

It is understood that the Centennial Commission has concluded to have the Live Stock display at the International Exhibition within the months of September and October, 1876: the periods devoted to each class and family being fifteen days, and the division as follows: Horses, mules and asses, (as one class) from September first to fifteenth. Horned Cattle, (of all varieties), from September twentieth to October fifth. Sheep, swine and goats, (as one class), from October tenth to twenty-fifth. Poultry will be exhibited from October twenty-eighth to November tenth. Animals to be eligible for admission to the International Exhibition must be, with the exception of trotting stock, walking horses, matched teams, fat and draught cattle, of such pedigree that the exhibitor can furnish satisfactory evidence to the Chief of Bureau that:—As applied to thorough-bred horses, as far back as the fifth generation of ancestors on both sides they are of pure blood, and of the same identical breed. As to Short Horned cattle, they are registered in either Allen's, Alexander's, or the English Herd-Books. As to

Holsteins, Herefords, Ayrshires, Devons, Guernseys, Britanmys, Kerrys, and other pure breeds, they are either imported or descended from imported animals on both sides. As to Jerseys, that they are entered in the Herd Register of the American Jersey Cattle Club, or in that of the Royal Agricultural Society of Jersey.—As to Sheep and Swine, that they are imported or descended from imported animals, and that the home bred shall be of pure blood as far back as the fifth generation. In awarding prizes to animals of pure blood the Judges will take in consideration chiefly the relative merits as to the power of the transmission of their valuable qualities; a cardinal object of the exhibition being to promote improvement in breeding stock. In case of doubt relative to the age of an animal, satisfactory proof must be furnished, or the animal will be subject to examination by a veterinary surgeon; and, should the state of dentition indicate that the age has not been correctly stated, the person so entering as an exhibitor will be prohibited from exhibiting in any class. All stalls will be regularly and distinctly numbered; corresponding numbers on labels of uniform character will be given to each exhibitor, and no animal will be allowed to pass from its stall without its proper number attached. Numbers *alone* will distinguish stock in the show-yards preceding the awards of prizes. The Judges of live stock will make examination of all animals on the opening day of each serial show, and will for that day have exclusive entrance to the show-yard. No premiums will be awarded an inferior animal, though there be no competition. On the last day of each serial show a public auction will be held of such animals as the exhibitors may desire to sell. Animals may be sold at private sale at any time during their exhibition. During the period of a serial show no animal, even in the event of being sold, will be allowed to be definitely removed. An Official Catalogue of the animals exhibited will be published. Exhibitors of thorough-bred animals must, at the time of making their entries, file with the Secretary of the Advisory Board of each Province a statement as to their pedigree, affirmed or sworn to before an officer authorized to take affidavits, and the papers so filed shall be furnished to the Jury of Experts. The ages of live stock must be calculated up to the opening day of the exhibition of the class to which they belong. Sheep breeders desiring to exhibit wool, the produce of the flocks, will display not less than five fleeces. All animals must be entered according to the prescribed rules as given in forms of entry, which forms will be furnished on application to the Secretary of the Advisory Board of each Province.

FISH.

It is the desire of the Canadian Commission of the International Exhibition to afford all reasonable facilities for the Exhibition of Fish, and the various appliances and processes used in fish culture. All parties engaged in the propagation of fish as a business pursuit, will, no doubt, find it of advantage to exhibit, as also those who are engaged in the manufacture of appliances for the culture and capture of fish. It is therefore suggested that the "Commissioners of Fisheries" of the various Provinces, take such concert of action as may surely accomplish so desirable an object; individual effort, however praiseworthy, can hardly be relied upon as expressing the importance and prospective extent of this new national industry. The details of arrangement for a display of fish and fish-breeding apparatus will be under the administration of the Canadian Commission.

POMOLOGY.

It is the purpose of the Centennial Commission of the International Exhibition, to afford every inducement and facility for a full and complete display of the fruits of every climate. It being questionable as to the practicability of exhibiting many perishable fruits, models in wax and plaster will be acceptable. Such a display of Pomological products as herein designated will, it is expected, cover the entire period during which the Exhibition will be open, though at all times varying in importance and extent. For instance, berries and other small fruits will be included in this department, and of these there will be certain classes as strawberries from the South, ready for exhibition on the opening day; and the variety and quantity will be presented in an increasing scale as the season advances. It will be perceived readily, that the most important display will be made during the months of September and October. The classification and arrangement of location of fruits sent for exhibition, will be according to their species and variety; all of similar character being assembled together, that a more satisfactory conclusion may be reached as to the respective merits of like products from different soils and Provinces; thus all grapes, from whatever source, will be placed in one position; the same with apples, pears, and the entire list of cultivated and wild fruits, and nuts. Exhibitors may be assured that the proper arrangements will be made for the united interests of themselves and pomological science. It is hoped that the Pomological Societies of the several Provinces, and individual cultivators generally, will co-operate in an effort to place before the world creditable evidence of the resources and capacity of our country in respect to fruit culture and products.

Fruits, shipped from Canada by express, will be received in Philadelphia, during the summer months, and displayed by the Canadian Commission, free of charge to the Exhibitor.

PRODUCTS OF THE FOREST.

It is earnestly requested by the Commission that Foresters forward samples of the trees of their respective Provinces. These samples or specimens may be presented in any convenient and portable form. In addition to specimens of trunks of trees should be exhibited timber and lumber in all forms; as samples of masts, and spars, large and small; knees and square timber, as prepared for naval purposes; planks and boards exhibiting unusual breadth and character of cell and fibre. In brief, every description, quality and form of wood used in construction and decoration. Foreign specimens are confidently expected, let us not fail to place ours side by side with them. It can hardly be necessary to add another word. The lumber interests of this country are too important not to be fully represented at the International Exhibition. Few of us, it may be assumed, comprehend and appreciate the lumber resources of the Dominion, and we can only do so by such an exhibit as is herein proposed. A Log House, measuring 60 feet by 40, will afford an excellent opportunity for the display of the heaviest timber produced in the Dominion. Sawn Lumber will be represented by ten pieces of each variety and size, in every Province. Samples of logs, one of each variety, are also desired from every Province.

The above are all the particulars for which we can find room this month, as the present number was nearly all in type before we received the Circular from which the information given was culled. Further particulars may, however, be obtained on application to the Hon. P. C. Hill, Chairman of the Advisory Committee for Nova Scotia, or to Professor Honeyman, D. C. L., Secretary.

THE ALDERNEY AND GUERNSEY COW.

While staying in Liverpool, getting our cattle together for shipment, we had the pleasure of making the acquaintance of Mr. Edward Parsons Fowler, of Southampton, and of examining with him a large Herd of Alderney and Guernsey Cows that he had just imported from the Islands, and was offering for sale at Liverpool. Mr. Fowler put into our hands a pamphlet he had prepared on the management of these Cows, and as it contains much information and good advice, given in a simple and intelligible

style, we intend to reprint portions of it for the information of our readers. Here is the first instalment:—

INTRODUCTORY CHAPTER.

The general preference which has been shown of late years for the Alderney and Guernsey Cow, as producing a higher quality of milk for dairy purposes than any other species, has induced the author, as well from his own conviction of its necessity, as from the suggestions of friends and customers, who have felt the want of such a treatise, to place the following epitome of his knowledge and experience before the public.

Until very recently, an impression has much prevailed that the Cow of the Channel Islands was unfitted, by its apparently delicate appearance and blood-like breeding, for the use of such persons as were unable to bestow on them the most assiduous attention and care; but experience, and a more intimate acquaintance with the animal, has shown that this impression is entirely without foundation, and we see now constantly the Alderney Cow thriving, under circumstances that would be fitting for any other Cow kept for the same purpose, viz., milking and breeding.

The Channel Islands Cow will be found invaluable for private family use, from its docility, easy pasturage, and small consumption, in comparison with the peculiar richness of its milk, the average in a dairy of forty Cows under such management as is hereafter set forth, having been ten pounds of butter from each Cow per week, whereas, in other dairies not more than from six to seven pounds is producible from the ordinary milch Cow, where alone quantity of milk has been desired, which is not the objection in a private family.

We have, therefore, the animal under consideration, the triple advantage, as before stated, of a symmetry of form, which renders it an ornament to the gentleman's lawn and paddock,—a docility, which makes it quiet under the tether, and in the hands of the milker, whether male or female,—and a richness of production, which not only fills the dairy with butter, but that of a firmness which it retains in the heat of the summer, and a richness through the cold of winter, when the butter of the ordinary Cow is barely marketable.

The prejudice against the Alderney which has existed amongst dairy farmers, whose object is only profit, by whatever legitimate means obtainable, is also now fast wearing away, there being scarcely one such in the Midland Counties who does not have a certain proportion of these cattle among his stock, experience having proved that the introduction of the Alderney or Guernsey, (especially

the latter), in the proportion of one to six other Cows, has so improved the character of the dairy, that from one penny to twopenny per pound in advance is obtained in any market, besides the *prestige* which the best commodity will always command.

The pre-eminent utility of the Alderney Cow as a cross in breeding, with the long horn, is universally allowed where the dairy is the object. For this purpose the Alderney is superior to the Guernsey, although the milk of the Guernsey is preferable to the Alderney for mixing in the dairy. The reasons which indicate the cross above mentioned are, on the part of the long-horn, its large quantity of milk, strength of constitution, longevity, and indisposition to fatten in a breeding state—and, on the part of the Alderney (*its rich quality of milk, fine breeding, and kind quiet disposition.*)

The Cow needed for the dairy cannot, under any circumstances, be selected for those qualities which will produce fat; the two natures are incompatible,—to have the best meat, we must get rid of every tendency to milk,—and to have the best butter, we must obviate every disposition to fatten. We cannot have both qualities in the same animal, and the attempt will only end in disappointment.

The results, then, of the above remarks are these—that in the first place the Alderney Cow is, above all others, especially the Cow for the gentleman's lawn and paddock, and for the dairy farmer the only means he has of recovering that peculiar and important animal, so long *lost sight of, which places breed beyond bulk, and was contemplated in the old adage that says—*

"The Cow to breed,
The Ox to feed."

CHAPTER II.

Having, in the first chapter, expatiated on the peculiar fitness of the Guernsey and Alderney Cow for the purposes of milking and breeding, it follows that I should now give such instructions to purchasers, as may enable them to choose a good, serviceable animal.

Commencing with the general configuration, it is necessary to observe that, as the Cow under consideration is a high-bred animal, very nearly the same general characteristics should be observed as exist in a well-bred horse.

The head should be small, slender, and lengthy from the eye to the nose, the horns thin and open—not cramped, or, as it is frequently expressed, too curly. The eye full, but not too prominent, the latter quality indicating an excitability and consequent restlessness of disposition that is not favourable to the production of milk. The ear lengthy and broad, and well fringed with hair, which protects it

subsists between the character and chemical composition of the land, and the root produce grown upon it. Turnips affected by anbury, I may observe in passing, I find are much richer in nitrogen and in mineral matters than sound roots, as will be seen by the following results, which I obtained in the analysis of a turnip attacked by this disorder:

COMPOSITION OF A TURNIP ATTACKED BY ANBURY.

Water	85.02
Albuminous compounds	3.50
Sugar, pectine, and digestible fibre	3.07
Woody fibre	3.27
Mineral matter (ash)	1.48
	100.00

*Containing nitrogen..... .57

On an average, sound nutritive turnips contain about 91 per cent. of water, and not more than 1 1/2 to 1 3/4 per cent. of nitrogenous compounds, and much less than was found in the diseased roots; and it appears from these, and numerous other results to which I shall have to refer presently, that a high percentage of nitrogen and of ash in roots rather indicate immaturity, and by no means superior feeding quality. Roots grown on peaty soils, it is well known, frequently are spongy, and of a low feeding quality. Peaty land often is greatly deficient in lime, and in that case the turnip crop is liable to finger-and-toe. Such is the character of two soils from Shropshire, analysed many years ago with the following results:—

PEATY SOILS.

	No. 1.	No 2.
Moisture	2.77	4.03
Organic matter	21.15	37.92
Oxides of iron and alumina	5.15	1.91
Carbonate of lime	.80	.52
Magnesia and alkalies	.88	.25
Insoluble silicious matter	69.25	55.37
	100.00	100.00

On No. 1, white turnips grow well up to a certain time, and then die off, and on No 2 soil they suffer from finger-and-toe. Here, then, we have some further examples, which show that the deficiency of lime and probably of other mineral matters in the soil, and the excess of organic matter, greatly effect the character of roots grown upon such land. The preceding examples amply illustrate the intimate relation which exists between the character of the root crops and the nature of the land upon which they are grown.

INFLUENCE OF MANURES.

Before speaking of the next subject, the influence of various kinds of manures upon roots, it appears to me desirable to a clear understanding of the remarks which I shall have to make on this head, to refer, as briefly as possible, to the average composition of the principal root crops, and to consider the various conditions which regulate their nutritive value.

The following table, founded on numerous analysis, shows the average composition of different root crops:

AVERAGE COMPOSITION OF ROOTS.

	Turnips.	Swedes.	Mangels.	Sugar beet.	Carrots (white Holstein.)	Parsnips.
Water	91.5	89.5	88.5	84.5	87.0	82.0
Albuminous compounds	1.1	1.5	1.5	1.5	.7	1.3
Fat	.2	.2	.1	.1	.1	.5
Pectine, &c.	1.5	1.0	1.0	.9	1.2	1.2
Starch	2.5
Sugar	2.0	5.0	5.5	9.5	6.5	3.0
Cellular fibre	2.0	2.1	2.4	2.5	2.5	7.5
Mineral matter (ash)	.7	.7	1.0	1.0	.9	1.0
	100.0	100.0	100.0	100.0	100.0	100.0

The amount of dry feeding matter, it will be seen, is largest in parsnips and smallest in white turnips. In the former we have as much as 18 per cent. of dry substance, and in the latter only 8 1/2 per cent. If we arrange the different root crops according to their percentage of water and dry substance, we get the following order:—1, parsnips; 2, sugar-beets; 3, carrots; 4, mangels; 5, swedes; 6, turnips. As regards the nutritive or feeding values of these different root crops, I am inclined to place them in the same order, and the least to turnips. The amount of solid matter in equally matured root, it strikes me, may be fairly taken as the measure of their comparative feeding value. Well matured roots, it will be seen, contain a considerable amount of sugar. The largest proportion occurs in sugar beets, the smallest in turnips. Upon it the feeding value of roots greatly depends. Excepting parsnips, in which a certain proportion of sugar is replaced by starch—a constituent which serves the same ends in the animal economy—the percentage of sugar in roots affords a good means for judging of their comparative feeding values. Thus we have in

Sugar-beets..... 91 per cent. of sugar on an average.

Carrots	63	"	"
Mangels	54	"	"
Swedes	5	"	"
Turnips	3	"	"

The order, based upon the per centage of sugar, it will be noticed, coincides with that based upon the per centage of dry matter in roots. Whether we judge of the nutritive value of well ripened roots by either standard, the practical result is the same. The proportion of sugar, as a rule, rises or falls with the per centage of water and dry matter in the roots. Starch occurs in considerable proportion in parsnips, and in small quantities in unripe mangels, carrots, and swedes. With the maturity of the last mentioned crops the starch disappears and becomes converted into sugar. The per centage of albuminous compounds and of ash constituents in different root crops on the whole do not vary in well-matured roots in the same degree as the per centage of sugar. The case is different in immature roots. Such roots, according to their comparative state of maturity, exhibit a much greater range of variations in nitrogenous matter and ash. I find invariably the per centage of nitrogen and of ash much larger in roots at the earlier stages of their growth than at a later; a high per centage of nitrogen and of mineral matter in roots, therefore, are indications not of their high feeding value, but the reverse. Briefly stated, the nutritive value of different root crops depends largely upon their state of maturity, or, in other words, upon the per centage of dry matter, and the proportion of sugar in the dry substance of the roots. Unripe turnips and mangels not only are poor in sugar, but they contain organic acids, which, together with an excess of imperfectly elaborated nitrogenous substances, appear to be the cause of the unwholesome properties of unripe roots. Mr. hay found .22 per cent. of oxalic acid in sugar-beet, .43 per cent. in the stalk, and as much as 1.56 per cent. in the leaves. In passing, I may notice that the leaves of root crops contain much more nitrogen than the bulbous roots; and as turnip or mangel tops, in regard to nutritive properties, are not to be compared with the roots, we have here positive proof of the fact already pointed out,

that the feeding value of root crops is by no means proportional to the nitrogen which they contain. That this is not merely a theoretical proposition is clearly shown by some direct feeding experiments which Mr. Lawes made in 1848, and fully described in a paper published in vol. viii., p. 495, of the *Journal of the Royal Agricultural Society of England*. with a view of testing practically the feeding value of four lots of white turnips, grown with different kinds of manures. Mr. Lawes determined the amount of dry organic matter which was consumed to produce 100 lb. of live weight in sheep fed upon white turnips from his experimental field. The following tabulated statement explains itself:—

EFFECTS OF MANURING.

	Mineral Manures only.	Manure with Ammonia	Minerals with Rape-cake	Minerals, Ammonia and Rape-cake.
Dry substance in the fresh turnips	9.37	8.42	7.78	7.88
Ash in dry roots	6.69	7.48	8.21	8.92
Nitrogen in dry roots	1.50	2.08	2.36	3.20
Dry organic matter consumed to produce 100 cwt of live weight.	lb. 2283	lb. 1321	lb. 2371	lb. 1067

The turnips grown with minerals only (superphosphate and alkalies) were over-ripe and pithy; the second lot, which gave the best result, were fully ripe; the third and fourth lots were unripe. The most unripe turnips, containing the highest per centage of nitrogen and of ash, it will be seen, gave the worst result when employed as food. These interesting experiments strikingly exemplify the influence of manures on the composition and feeding qualities of turnips. Let us now examine a little more minutely the modifying influence of different kinds of manuring agents on root crops. Land highly manured with rich dung from the fattening boxes or stalls induces luxuriant and vigorous growth in root crops, and, as is well known, has a tendency to develop over-luxuriance in the tops. This is the case more particularly if the dung is derived from fattening beasts, liberally supplied with oilcake and artificial food rich in nitrogenous constituents. If the autumn turns out fairly dry and warm, the roots in highly manured lands continue to grow vigorously, the bulbs swell to a large dimension; and if the weather in September and October continues warm and dry, a heavy weight and fairly ripe roots result from the liberal use of rich dung. But should the autumn be cold and wet, too liberal an application of good, well-rotten dung is apt to maintain the luxuriant tops in a vigorous, active, growing condition, at a period of the year when the crop has to be taken up, and the result is an immature root crop of a low feeding value. Although the bulbs may be of a good size, they turn out, when grown under such conditions, watery, deficient in sugar, and not nearly as nutritious as they would have been had a more moderate dressing of dung been put upon the land. The main cause of the immature and low feeding quality of mangel grown with an excessive quantity of rich dug is the comparatively large amount of ammoniacal and nitrogenous constituents in the dung, for numerous field experiments have shown that the peculiar tendency of ammonia salts, and of readily avail-

able nitrogenous substances, is to induce luxuriant leaf development and vigorous prolonged growth, which results frequently, in our fickle climate, in a more or less immature condition of the roots. There is thus danger of over manuring root-crops; and the desire to produce heavy crops of mangel not unfrequently leads practical men to appreciate sufficiently this danger. It is quite true mangels are very greedy feeders, and no doubt some soils will swallow up almost any amount of dung; but at the same time it has to be borne in mind that all land is not alike, and that there are many naturally rich clay loams containing immense stores of plant-food, which requires only to be brought into play by good cultivation in order to become available to plants. I am much inclined to think that it is a mistake to manure soils of the latter description too liberally with dung, even for mangel, and that in many cases a more economical result, and certainly a better quality of mangel, although not so heavy a crop, would be given, if, instead of all the enormous dressings of dung which are often applied to that crop, the land were manured in autumn with only half the quantity of dung and the seed drilled in with 3 or 4 cwt. of superphosphate or dissolved bones, which manures, as we shall see presently, have a tendency to produce early maturity in roots. We frequently hear of complaints that mangels scour, or do not keep well. Complaints of this kind are only the expressions in other words for the immature condition of the roots, and in many cases the cause of this undesirable condition has to be sought in the excessive amount of ammoniacal or nitrogenous constituents which are applied to the mangels in the shape of heavy dressings of dung. The same remarks apply with equal force to the exclusive and too abundant use of Peruvian guano, sulphate of ammonia, and nitrogenous manures in general. The special effect of all ammoniacal and nitrogenous manures in general, as already stated, is to produce luxuriant leaf-development, to induce prolonged and vigorous growth, resulting in an immature and watery condition of the bulbs. Luxuriantly-growing roots always contain more water, as a rule, more nitrogen, and mineral or ash constituents, than less vigorous plants of the same age; and hence large roots, generally speaking, are far less nutritious than better matured roots of a moderate size. For illustration of this fact I quote the following comparative analysis:

COMPOSITION OF MANGELS.

	Water.	Nitrogenous Constituents.	Sugar.	Carb., &c.	Crude Fibre	Ashes.
Mangel, 9 lb.....	91.85	1.34	2.86	2.54	1.41	
" 7½ lb.....	89.48	1.24	3.95	4.51	.82	
Mangel, 4 lb.....	89.77	0.73	7.63	.89	.93	
" 1 to 2 lb..	86.98	0.61	10.51	1.07	.91	
Sugar-beet, 5½ lb	83.01	2.03	5.60	1.73	2.38	
" 4½ lb..	84.85	1.17	8.10	5.28	1.10	

Small mangels approach sugar beets in composition, whilst large sugar beets are hardly better than common mangels, and monster beets are even less nutritious than well matured mangels of fair average size. Monster roots, as is well known, are always very watery, poor in sugar, and almost useless for feeding purposes. The contrast in the quali-

ty of excessively big and moderately-sized roots is very striking, as will be seen by the following analyses of a crop of 15 samples of beets, grown in 1869, in the neighborhood of Lavenham, in Suffolk:

COMPOSITION OF SUGAR-BEET.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Water.....	83.76	84.08	91.35	91.50	82.40
Crystallisable sugar.....	10.50	10.98	4.06	3.89	11.00
*Albuminous compounds.....	.03	.78	1.35	1.04	.81
Carb. and colouring matter.....	.02	.03	.34	.30	.00
Crude fibre (pulp).....	2.18	2.71	1.72	1.86	3.87
Mineral matter (ash).....	1.16	.77	1.19	1.81	1.14
	100.00	100.00	100.00	100.00	100.00
Specific gravity of juice.....	1.0570	1.0640	1.0352	1.0388	1.03218
At a temperature of.....	58° F.	58° F.	58° F.	58° F.	64° F.
Weight of roots.....	21 lb.	1 lb. 10½ oz.	16 lb. 12½ lb.	21 lb.	21 lb.
*Containing nitrogen.....	.149	.125	.216	.167	on average.

Nos. 1 and 2 were sugar-beets grown in France; Nos. 3 and 4, two monstrous beets grown at Buscott Park, Berkshire; and No. 5, Lavenham beets.

The sugar-beets which were grown in Suffolk, it will be seen, were fully as rich in sugar as the French roots, and in all respects quite equal to them for the manufacture of sugar, whilst the Lavenham beets contained 11 per cent. of sugar and only 82 per cent. of water, the big Berkshire beets—one weighing 16 lb., and the other 12½ lb.—contained only 3.89 or 4 per cent. of sugar respectively, and, in round numbers, as much as 91½ per cent. of water. This high per-centage of water is accompanied by a larger amount of albuminous compounds and of mineral matter than the proportions in roots containing very much more solid feeding matter. A large amount of albuminous matter and of ash, indeed, indicates immaturity and poverty in sugar, a condition characteristic of big, excessively manured roots.

Numerous examples of the difference in the quality of large and small and moderate-sized roots will be found in my paper on the composition of sugar beets, published in the *Journal of the Royal Agricultural Society* some years ago. Whilst speaking of large and small roots, permit me to say a word or two upon the childish practice of exhibiting monster roots at agricultural shows, and of giving prizes for such roots. Surely, by dint of manure, and plenty of elbow-room, it is no great art or merit to grow monster turnips and mangels. Such roots may delight or astonish women and children, but what, it may well be asked, is the use of such productions? and why should prizes be awarded to monster roots, which generally contain from 93 to 94 per cent. of water, and but little sugar, as the following analysis of a big green barrel turnip will show? In this root, weighing 19 lb., I found:—

Water.....	94.103
*Albuminous compounds.....	.015
Pectine, gum, and a little sugar.....	3.171
Crude fibre (pulp).....	1.535
Mineral matter (ash).....	.576
	100.00

*Containing nitrogen..... 0.93

The general influence of dung upon the weight of the produce and the quality of the roots is well known to practical men, and well illustrated in detail by the following experiments, which were brought under my notice in 1869. Three lots of sugar beets, of four roots each, grown experimentally at Glasnevin, near Dublin, on analysis, were found by me to have the following composition:—

	No. 1.	No. 2.	No. 3.
Water.....	7.60	85.59	89.09
*Albuminous compounds.....	1.47	1.64	1.27
Crystallisable sugar.....	3.59	7.87	0.78
Pectine, &c.....	.54	.75	.45
Crude fibre (pulp).....	2.87	3.06	2.43
Mineral matter (ash).....	.96	1.07	.98
	100.00	100.00	100.00
*Containing nitrogen.....	.230	.250	.264

The average weight of the three lots of roots was about the same in each case, and amounted to about 2 lb. per root. The beets marked No. 1 were sown in drills, on May 13 to 15, 21 in. apart, and 6 in. apart, and 6 in. in the row; no manure was applied, the previous crop (mangels) having been manured at the rate of 25 ton per acre; estimated produce per acre, 13 ton 2 cwt. 3 qr. No. 2, sown May 11 and 12, in drills 27 in. apart, and 6 in. in the row; farmyard manure was applied at the rate of 12 ton per acre; previous crop, swedes; estimated produce per acre, 19 ton 2 cwt. 3 qr. No. 3, sown on May 16, in drills on the flat, 21 in. apart, and 6 in. in the row; farmyard manure was applied at the rate of 25 ton per acre; previous crop, oats, followed by rape as a stolen crop; estimated produce, 10 ton 5 cwt. 2 qr. per acre. These experiments are interesting, as showing the prejudicial effect of the direct application of farmyard manure to sugar-beets, especially if the crop is sown as late as were the roots in the Glasnevin experiments. Without manure, it will be noticed, the beets No. 1 yielded 8.56 per cent. of sugar; with a moderate dressing of farmyard manure, No. 2 produced 7.87 per cent.; and No. 3, with a full dressing of farmyard manure, 6.73 per cent. of sugar.

Peruvian guano, sulphate of ammonia, dried blood, and flesh refuse, and, generally speaking, all nitrogenous manures, either should not be used at all, or only sparingly, for roots on stiffish land and all soils which contain a good deal of clay, and are naturally cold and unfavourable to a vigorous and rapid growth. On the other hand, raw, or better still, dissolved Peruvian guano, is an excellent manure for root crops upon light land, which, like most productive soils and friable turnip loams, favours the quick and vigorous growth of roots, and is conducive to early maturity. On such soils the application of ammoniacal or nitrogenous manures prolongs the period of growth of roots and their assimilation of atmospheric food, and it is mainly for this reason that Peruvian guano and well rotted dung are held in such high estimation by Scotch farmers for producing the heavy crops of roots that are generally grown on the light lands in the West of Scotland. As a rule, the fields intended for roots, I believe, with most farmers, are best dunged in the autumn. Ammoniacal manures, such as guano and sulphate of ammonia, should be sown broadcast in autumn or early in spring, and not drilled in with the seed, for all ammoniacal manures, contrary to the generally received opinion, have a tendency rather to check than to pro-

mote the early growth of the young plant, for which reason such manures should be well distributed, and amalgamated with a large body of soil, and not be placed in too close a proximity with the young turnips and mangel plants. I have made a good many field experiments on this subject, and find that, on moderately stiff soils, rotten dung, Peruvian guano, and sulphate of ammonia, and all nitrogenous manures, which later in the season sustain a vigorous and luxuriant growth, in a remarkable degree retard the progress of turnip and mangel plants in their earliest stages of development. It is not on highly-manured land, but on naturally poor and unmanured sandy soils, that turnips come soonest to the hoe. I have noticed repeatedly that on recently-manured land the fly destroys the young plants much more effectually than on soils dunged in autumn, and believe the explanation of this fact, which is well known to many farmers, is supplied in the circumstance that on the autumn-dunged land the nitrogenous constituents of the dung get more thoroughly distributed in the soil than is the case when the dung is put upon the land in spring, when the young turnip plants come into a more direct contact with the dung, in consequence of which the earliest growth of the young plants is retarded to an extent which gives the turnip fly ample time to clear off the plants. Nitrate of soda has the same general effect upon root crops as nitrogenous manures, but it appears to be more energetic in its action, and, on the whole, to be a useful addition to home manures, and to increase the produce in roots more considerably than salts of ammonia. Its effect is specially marked upon mangels, and to my knowledge heavy crops of mangels have been produced upon rather light land by $\frac{1}{2}$ cwt. of nitrate of soda, 2 cwt. of common salt, sown broadcast, and 4 cwt. of dissolved bones drilled in with the seed. With regard to the use of salt as a manure for root crops, I would observe that salt checks over-luxuriance in the tops, and prolongs the period of active growth. In consequence of this specific action it may be employed with benefit as an auxiliary manure for swedes and mangels upon light land; but, according to my experience, it does no good, and, in quantities larger than 3 cwt. per acre, rather diminishes than increases the root produce upon heavy land. Potash salts, in some field experiments which I have tried in different parts of the country, have shown that potash has a decidedly beneficial effect upon root crops on poor sandy soil; whilst on the majority of land, and notably upon clays or clay loams, or soils in a good agricultural condition, salts of potash do not increase the produce. The special effect of superphosphate, dissolved bones, and similar phosphatic manures, is to produce early maturity; and hence phosphatic manures are employed in practice very largely, and with much benefit, by root growers. In free-growing light soils it is desirable either to use dissolved bones, in addition to half a dressing of farmyard manure as a manure for roots, or to spread broadcast 2 or 3 cwt. of dissolved Peruvian guano, and 2 cwt. of salt, or 2 of guano and 1 cwt. of nitrate of soda and 2 cwt. of common salt, and to drill with the seed 3 to 4 cwt. of dissolved bones. On the heavier description of soils it is preferable to use mineral superphosphate for roots, especially if the land has been dressed in autumn with a moderate quantity of dung. The addition of ammoniacal manures to superphos-

phate has a tendency to retard the maturity of the root crop, for which reason mineral superphosphate, applied alone to the stiffer classes of soils, generally speaking, has a better practical effect upon the produce than dissolved bones, or mixed ammoniacal or phosphatic manures. On account of the valuable property of readily available phosphates to cause early maturity, neither turnips nor mangels, nor, indeed, any root crop, in my judgment, should be grown without superphosphates, 3 or 4 cwt. of which per acre are best drilled in at the time of sowing. Thus much with regard to the special effects of the principal fertilising matters upon root crops. It will appear that a knowledge of the rationale of action of the various manuring matters, and a due consideration of the variable character of soils, and the peculiarities of the prevailing climate in a district, will enable a root grower to compound for himself in the most suitable manner artificial manuring mixtures, or to confine himself to the use of purely mineral superphosphates, and to reap the benefit of his knowledge in the shape of heavy and sound root crops, at a more moderate expenditure than the farmer who, in the selection of the manures he applies to his root crops, is not guided by a proper consideration of the principles involved in the economic application of manures, and who depends, in a great measure, upon the recommendations of the local manure merchants and agents, who, naturally enough, are loud in praising their special compounds.

There remains for our consideration one more fertiliser upon which you will, perhaps, expect me to say a few words. I refer to town sewage, which, as you are aware, has been applied with more or less beneficial effect to roots, especially to mangels. Without doubt, town sewage is a most useful fertiliser for root crops, especially for mangels, provided it be applied to the land at the right time, and in proper quantities. Town sewage may be employed with great advantage repeatedly in large doses during the first two or three months of the growth of the root crops. In dry springs especially the liberal application of sewage cannot fail to be of the utmost utility to farmers who can command a supply of this liquid fertiliser. It then encourages an early, luxuriant, and healthy development of leaves, by which sugar is afterwards elaborated from atmospheric food, and stored up in the roots. Almost any quantity of town sewage may be applied to root crops during the first two months of their growth; but subsequently, and more especially when the bulbs have reached a considerable size, sewage should be withheld, or otherwise the crop will not properly ripen, and will not be worth much for feeding purposes. It is important to bear in mind that the more completely the supply of soil food is withheld during the late summer months, the more fully the roots will ripen, and the richer they will become in sugar in consequence. Town sewage is held in bad repute by not a few farmers, whose experience leads them to suspect that there is something or other in sewage prejudicial to the production of sound roots of good feeding qualities. I believe this is a mistake, for sewage contains nothing inimical to the healthy growth and development of roots; and the examination of mangels and sugar-beets has shown me that perfectly sound and nutritious roots can be grown with town sewage. At the same time I may state that some of the worst and

least nutritious mangels which have ever been analysed by me were grown with sewage; and I have therefore come to the conclusion that ill success with sewage as a manure for mangels in most cases is due to its injudicious use, and not to any inherent bad qualities which it has been supposed to possess.

INFLUENCE OF CLIMATE.

My remarks on the dependence of root crops upon the character of the soil upon which they are grown, and upon the composition of the various manures employed, have already occupied so much of the time that can be devoted to the subject appointed for our evening's discussion, that little or no time is left at my disposal to dwell upon the influence of the climate upon the quality of root crops. I regret this the less, because, under this head, with one exception, I have not any remarks to offer which are based on special and personal experience, and I hardly think it profitable to allude to matters of common observation, with which most agriculturists are familiar. The exception to which I allude has reference to the cultivation of the sugar-beet, not usually grown in England. Doubts have been expressed as regards the suitability of the English climate to the production of beets sufficiently rich in sugar to satisfy the demands of the manufacturer of sugar.—Having had a good deal of experience of beet-root culture, I have no hesitation in saying that our English climate, on the whole, is favourable to sugar-beet culture. Our summers are quite warm enough to ripen sugar-beets sufficiently, and to produce roots rich in sugar, in proof of which I might quote numerous analyses of sugar-beets, clearly showing that they can be grown of as good a quality in many parts of England as on the Continent. This crop does not require an excessive summer heat in order to come to perfection. Indeed, sugar-beets do not do nearly so well in central France as in Germany, nor in the South as in the North, where the summer temperature is much lower. It is not so much heat as a dry and unclouded sky during the autumnal months, which makes the sugar in the beet. A bright and dry August seems to do more for sugar-beet than almost any other condition, however favorable it may be to the luxuriant growth of this crop. Sugar-beet culture, therefore, is not likely to succeed well in a great part of Ireland and Scotland, nor in the Southern and South-western Counties of England, nor in localities in which the late summer and autumn are, as a rule, wet. On the other hand, the climate of the Eastern and Northern Counties, and of the east coast of Scotland, is by no means unfavorable to the cultivation of sugar-beets, so that in all districts where common mangels do well sugar-beets may also be grown successfully.

DISCUSSION.

Mr. J. K. Fowler said he had gathered from Dr. Voelcker's paper the superiority of sugar-beet to ordinary mangel wurzel as a cattle crop. Some years ago he had visited the Eastern counties, and was so struck with the beet culture that he saw there, that he determined to adopt it himself at Aylesbury. He had grown sugar-beet for the last three years, and found them a very valuable crop, though not so valuable in the mean time as mangels. But with larger experience they might do better. The best beetroot for cultivation he had found to be the white Sile-

sian beet. As a successful exhibitor of large roots at various shows, he fully concurred with Dr. Voelcker as to the uselessness of these big roots; what they required was a good crop of medium-sized roots, and not those "sensational" roots that were the admiration of women and children.

Mr. Cousmaker said that the discussion that evening abundantly proved that the discussion of subjects of practical importance to the farmer was as popular as ever to the members of that Club. It was many years since he had been on his feet in that room, but as a large grower of roots the subject had tempted him to rise. Speaking of the value of roots as food, he would mention that he had made a practice of giving mangels kept late on in summer, along with tares, even dispensing with the use of oil-cake. He spoke of Sutton's Golden Tankard as the best mangel he knew.

Mr. Caldecott said mangels were more valuable for feeding purposes than swedes.—He had found that manure manufactured from sewage was hardly worth the cartage. Also that the injudicious application of manure to the land favoured the growth of weeds. Sewage, however, when judiciously applied to young roots, would be found of great advantage.

Mr. Little said that his experience thoroughly agreed with that of Dr. Voelcker, that the excessive use of farmyard manure was rather detrimental than otherwise. He also agreed with him in condemning the folly of growing large roots. Mr. Lawes, in last year's *Agricultural Gazette*, had said that in comparing two crops grown in Ireland, he had found that a crop of mangels, of 40 ton to the acre, did not exceed in feeding power another where only 20 ton per acre were obtained.—Still he would not condemn large roots entirely, but would remind them that they were glad with anything to fill the bellies of their animals.

Mr. J. J. Mechi said he had always been a large grower of mangels, of which he never failed to get a good crop. He had grown as many as 43 ton per acre. Neither kohl rabi nor cabbage had been mentioned, and yet they were both very valuable and important crops.

Mr. Trethewey considered kohl rabi one of our most valuable crops, and he was surprised that Dr. Voelcker had omitted all mention of it from his paper. The keeping power of mangels depended to a great extent upon the mode of stacking. The longer mangels were kept in season the better. He was now feeding his cattle with last year's mangels. Kohl rabi had this great advantage over all other roots—it could be had, by being sown at the proper time, from September to March, and produced more per acre than any other.

Mr. C. S. Read, M. P., said as he had spent some time this summer and autumn in wandering over England, Scotland, and the Continent, he had had some opportunity of observing that which Dr. Voelcker treated last and least—climate. He expressed his wonder at seeing that Norfolk was doing so ill in that which Scotland was doing so well in—the growth of mangel. The wretched crops obtained in Norfolk must be owing to the soil being sick of the mangel, or else the manures were too stimulating, for while gentlemen were talking of raising 40 ton per acre, the average in Norfolk was not more than 10 ton. He had tried kohl rabi, but had given up that. As to the time of using

mangel, some had said it should not be used until July, but he would use the current crop in October, if it had been pulled up for two or three weeks before use. As to the large crops, a year ago he had made a remark expressing doubts as to large crops, (of 46 ton to the acre), and to those who agreed with him in his doubts he said that if they went into the South of England and into Scotland they would be astonished at the growth of root crops. He could say, too, that it was astonishing that the diseases of swedes did not seem to extend to Scotland, for he saw more bad swedes on his farm than he had seen in the whole of Scotland. He considered that in the East the growth of mangel must be persevered with. With regard to large roots he could only say that at the present time a large quantity of dry provender was used, and so the fact of their containing a quantity of water did not so much matter.

Dr. Voelcker, referring to the relation of climate to the subject, said that until last year he had always been rather doubtful about the large root crops grown in Scotland, but after having seen some last year he was no longer surprised. He asked what manure they put per acre in order to produce these crops. He was told 10 cwt. of bone dust, 5 cwt. Peruvian guano, and 5 cwt. superphosphate. They might judge from that of the cost of these crops.

After votes of thanks to Dr. Voelcker and the Chairman, the meeting adjourned.—*Agricultural Gazette*.

ROTATION OF CROPS.

(Concluded.)

We shall proceed to discuss the various kinds of Rotations that have been or are still in use among farmers; and on this part of our subject we may, even at this period, accept the authority of Sir John Sinclair, as one of the most satisfactory of any brought to the discussion of the topic; we shall, therefore, draw largely from the facts and opinions which he details.

The first kind of rotation, we shall notice, is that called the "Two Years' Rotation"—It is only in particular cases that farmers have adopted a rotation of two crops. This was, however, illustrated by a field belonging to the Honourable George Abercromby, embanked from the Forth, which carried, for several successive years, beans and wheat alternately. Upon his best loams Mr. Brown of Markle also obtained wheat and beans alternately, summer following the ground when its condition required that process. Mr. Fairie of Farnie, near Glasgow, adopted the same system, giving a moderate dressing of dung every four years. A similar system has been tried near Edinburgh, on loam, the rotation being wheat and green crops alternately, potatoes and beans, both drilled. In the course of fourteen years, a field of 4½ acres gave four crops of potatoes, three of beans and seven of wheat. To every green crop, putrescent manure was applied; thirty tons at least to potatoes, and twenty-five to beans. The potato-crops were all good. The two first crops of beans were very good—the third indifferent; but the crops of wheat were large, producing from ten to thirteen bolls, per Scotch acre, or from 32 to 21 bushels per English acre. The only deficiency was in a crop which

averaged but 9 bolls per acre; but that might have been caused by a season peculiarly unfavourable. There was no evidence of diminished fertility in the field, and it was perfectly free from couch grass and rooted perennial weeds. In fact, Dr. Stuart stated, that the quantity of produce had not diminished from the above rotation, but that both the wheat and beans degenerated in quality; and on this account, though the result might not be thought unfavourable by many, he would not, adopt it, if he had a larger space of land on his farm calculated for wheat. It is evident that it is only on the richest loams, or most fertile soils, or where manure is plentiful, that such a rotation is practicable.

Three Years' Rotation.—Sir John Sinclair observes in reference to this rotation of three crops, that as there was no instance of that sort in Scotland, he could give an example practiced by a native of Scotland, Mr. Arbuthnot, who farmed at Surrey: that gentleman practiced, for nine years, a three-course system, viz., 1, beans; 2, wheat; 3, clover; and when he quitted the farm where that plan was adopted he was fully persuaded, that he could have continued the same rotation for many years longer. This, however, was effected by means of London dung, which he had at command, and which he gave to the bean crop. He also ploughed nine inches deep, with a swing plough, the construction of which has been justly celebrated.

Other farmers have followed a similar system; for instance, 1, potatoes, cabbage, or hoed crops, with manure; 2, wheat, and 3, clover or grass; or 1, hoed crop, with manure; 2, half oats and half barley; 3, clover or grass.

Dr. Coventry has made some observations upon these courses to which he urges the following objections; 1. That there is rather too large a proportion of fallow or cleansing crop, more than what can be wanted in ordinary situations to preserve the land free of weeds. 2. By there being but one third bearing corn, it is less profitable than it might be. 3. There are two species of crops in the first example, which circumstance does not permit the labour to be sufficiently divided and extended over the year, and leaves too much to be risked on the success of a particular crop. 4. The quantity of straw obtained for food or litter, to live stock, must be rather scanty, or in a deficient proportion to what will in general be wanted.

The advantages of such a system, he states in the following terms:—1. From the great proportion of green crops in this course, much manure will be procured, for all the straw will be converted into dung. 2. This scheme is calculated to render or preserve the land very clean of weeds, in consequence of which Sir John Sinclair thought it might answer as a beginning course in situations where the ground was foul and manure wanted; not indeed that it was in general use in any district, for it had only been followed by some individuals, who found it of benefit in the respects above-mentioned.

Four Years' Rotations.—Rotations of four crops have long been more general, and their merits, as compared with the present improved rotations, were fully discussed in previous numbers. The first to be pointed out here is the celebrated Norfolk system, namely, 1, turnips; 2, barley; 3, clover, and 4 wheat, which was long extensively adopted in several parts of Scotland. Even in Norfolk, however, his

course began to fail fifty years ago, being considered prejudicial to the landlord; and also, because, on a lease of twenty-one years, if constantly persevered in, it would not be found profitable to the tenant. "Half the farm has annually a white straw crop, which, from the frequency of the repetition, would not be productive; besides which the number of sheep and cattle kept under this system is comparatively trifling. It is also much doubted whether wheat will prosper so near the barley crop; and it can hardly be questioned, that without a plentiful supply of extra manure, both the turnip and the clover crop will fail, unless the land is refreshed by grass for at least two or three years." The same writer proceeds to observe: "It may be proper to compare this rotation, with others on a similar principle, for dry soils. In Roxburghshire, Mr. Walker of Millendean's rotation is one-fourth in turnip and drill beans, and sown with grass seeds; one-fourth in hay, soiling and pasture-grass; and one-fourth in wheat or oats, after hay and pasture. In the light soils of Norfolk, neither beans nor oats are cultivated, and beans are certainly not suitable to every light turnip land."

JERSEY COWS—ENGLISH VIEW OF COLOR.

If the value of Jersey stock is to rest on color, deterioration will surely follow of those useful qualities that are far more noticeable in the good old-fashioned parti-colored cow, than that which will be found among the generality of fine, high bred, white-colored fawns, grays, or foxy, so-called Jerseys. I have owned hundreds of acclimated Jersey stock, and have never, as a rule, found the whole-colored such large producers, as many parti-colored ones; in fact by far the most butter-producing cow I have ever possessed, was not only parti-colored, but the most ugly and ungainly beast of the lot, yet her stock have never failed to show their large butter-making qualities. The true type of a Jersey cow is in fact an animal that will not make meat. I do not say that this is not improved upon, by acclimatization and a slight introduction of a hardier breed, of which what are termed Chichester Jerseys are the best description, neither do I say, that Jersey breeders in the Island itself have not in some instances a breed that shows a disposition to make some flesh, and very probably may then be following up the requirements of fashion, yet I maintain that a pure Jersey should throw the bulk of her feeding properties into butter, and with little to flesh. The parti-colored good cow may have but a white spot, especially under the belly, but throughout the body the rich yellow skin, under any colored hair, will be found, black, white, or fawn. I have seen the commencement of a white-colored herd, the property of a noble duke, to obtain which I have seen wealthy and large producing cows sold off to prevent an animal remaining with the

slightest stain of other than one color. I have heard from good authority that usefulness has been sacrificed for fashion in this instance, which, if followed up, as it rapidly is, I have no doubt that the future rich Jersey will be beef, not butter, as it was.—*London Agricultural Gazette.*

FAT IN MILK AND CHEESE.

In reference to the fact recently demonstrated, that fat arises from the decomposition of albumen in living organisms, a writer in the *Milch Zeitung* is satisfied that the same process goes on in albumen after it has been removed from the animal body.

He found that the fatty matter contained in the milk increases in quantity for a few days after it is drawn, while the amount of albumen becomes less. But the formation of fat in milk freely exposed to the air is conditional on the development of fungi. If their germs are destroyed by the milk being raised to a temperature of 180 degrees, or if means are purposely taken to prevent the admission of fungus germs to it while the access of air is still permitted, the fatty contents of the milk diminish, the existing fat is oxydized by the air and no new compensatory supply is formed.

Exactly analogous processes attend the formation of fat in cheese. Here, also, the existing proportion of butter is diminished by the atmospheric air on the one hand, while on the other a fresh supply is formed by the influence of the fungi which are becoming developed. According to the preponderance of one or the other processes, the fat contents of old cheese will rise or fall in amount.

The *Rural New Yorker* in commenting on this says:

The philosophy of curing cheese is very imperfectly understood—at least in America. Many dairymen, as well as cheese dealers, do not believe that fat in cheese can be produced in any other way than by the cream which is in the milk. And yet it has been proved over and over again, that cheese properly cured, though made from milk partly skimmed, is often more mellow and rich tasting than cheese made from whole-milk, but not so well cured.

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