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# THE ILLUSTRATED JOURNAL OF AGRICULTURE

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### PROVINCIAL EXHIBITION, 1882.

The length of time which elapsed before judges could be found for the Jerseys, prevents the appearance of my usual article on the Exhibition until next month.

#### Forestry Association.

A full report of the meeting of the Provincial Forestry Association is, unfortunately, impossible, until the issue of the November number. However, I may say, that the good work is going on well, and great interest is being shown in this most necessary movement by all classes.—A. R. J. F.

#### The American Forestry Association.

The Association met, this year, at Montreal on the 21st of August. The audience was large, and composed of a variety of classes—scientific men, doctors, lawyers, lumbermen, &c., and as might be expected, the assemblage of so many different interests led to no small amount of confusion. Several of those who ought only to have listened and tried to learn, took upon themselves to speak, and worried the audience by their inanities; while those who had really something to say preserved an absolute silence: Self-conceit and self-confidence on the one hand; false-modesty and timidity on the other.

The programme of the Society was extensive; so extensive, that, though some of the subjects were exhaustively treated, others were only skimmed over, and some were not touched.

The principal subjects were as follows:

1. The preservation of existing forests;
2. The best way of utilising the wood-lands in the interests of the proprietors, the public, and the revenue;
3. The duties of government as regards the forests;
4. The development of wood-lands where they are scarce,

and the replanting of them where necessary, particularly in the West;

5. The protection of forests against fire;
6. What trees should be planted for commercial, climatic, sanitary, and ornamental purposes;
7. Connection between forests and the annual rain-fall;
8. Usefulness of roadside trees;
9. Railroad-companies' plantations;
10. Fruit-tree planting;
11. Climatology and forest-culture.
12. Necessity for instruction in arboriculture.

1.—*The preservation of existing forests*: this question was treated by Messrs Hurlbert, Fyles, Ward, d'Ailley, Halsted, Robb, Marler, Martin, &c. After discussion, the general opinion seemed to be that it would be advisable, 1. to compel settlers to keep part of their land in wood; 2. to forbid lumbermen to cut trees less than a foot in diameter, or thereabouts; 3. to oblige lumbermen and other wood-cutters to clear away the branches, tops, &c., and to burn them at a certain fixed time; but at what time, was left unsettled; 4. to keep in the hands of government all wood-lands unfit for agricultural purposes, and on no account to dispose of them; 5. that special guardians should be appointed, to watch over the observation of the forest-laws, and above all to prevent bush-fires.

2. and 3.—*The best way of utilising wood-lands, and the duties of government as regards the forests*. On these subjects, Messrs John Dougall, Editor of the *New York Witness* (this gentleman's address was one of the best at the congress), Beaufort Hurlbert, Thayne, Scofield, Hicks, Jenkins, Haycock, Humphrey, &c., read papers, and the sensible observations of the honourable M. Mailhot, the only French-Canadian who took part in the discussion, were well received by the audience.

4.—*Planting and re-planting*. Mr Hough read a most important and interesting paper on these points. He is without doubt one of the best authorities on forestry of the present day. The questions were also treated by the honourable Mr Joly, Messrs Egleston, Read, Beadle, Beal, Warder, Tay, &c. The general impression made by the discussion that followed was that, 1. the seed of forest-trees should be sown in those regions utterly woodless, as it was held by all that, in such places, sowing is better than transplanting; 2. that the second-growth of wood after fires or other destructive accidents should be encouraged and protected; 3. that wherever land is unfit for cultivation it should be sown or planted with trees at once.

5.—*Protection of forests against fire*. No decision was arrived on this most important point, but the opinion seemed to be general that, 1. burning the clearings should be forbidden at certain seasons of the year; 2. fishing and shooting parties should be watched more closely, as they are the principal causes of bush-fires; 3. all lumbermen and wood-cutters should be compelled to burn the rubbish at a fixed time;

4. A special police be appointed to look after all these matters.

6.—*What kinds of trees should be generally planted.* Many papers were read on the subject, but one especially good by Mr Bernhard E. Fernow, Slatington, Pa. It is no exaggeration to say that this essay is, so to speak, a *résumé* before the fact of the congress, so complete was it in all that transactions of the concerns forestry.

On Dr Howard's paper, on the hygienic properties of forests, a rather warm discussion arose between the President, Mr Loring, and the learned author. I never saw such a display of science, so much wandering from the point, so many hazardous affirmations of, as yet, doubtful scientific doctrines, in one simple article. Dr Howard is evidently a *savant*, but his forests are as evidently full of brambles and briars. It is little, however, that Mr Loring cares for such trivial hindrances. The honourable Mr Joly excited the interest of the audience by his paper on the sowing of forest trees and the best sorts for planting.

7.—*Connection between forests and the rain-fall.* Papers on this subject were read by Messrs Lyon and Humphrey. They showed that forests exercise great influence over the distribution of rain, and over the floodings of the land by the sudden rise of rivers. Certain districts, formerly fertile, have been reduced to a state of sterility by the clearance of timber, by which long droughts have been produced, and the level of the rivers which flow through the country permanently lowered. A question of hygiene was also raised in connection with this subject.

8.—*Utility of tree-planting along public roads and in towns.* Mr W. Hale, of Sherbrooke, treated this subject from the *dilettante* point of view—(and very well he did it, A. R. J. F.); but there are other considerations which must be thought well over before we can recommend the universal practice of thus ornamenting our long and weary roads. The plan answers well where the roads are made of broken stones, and where the land is sandy; but where clay is the principal constituent of the soil, as it is in most parts of this province, trees would prevent the roads from drying, and do infinitely more harm than good. A question of hygiene, as regards towns, meets us again here.

9.—*Railroad-companies' planting.* Dr Hough, and Dr Warder read, each, a noteworthy paper on this subject. After stating the enormous quantity of wood necessary to furnish the railroads of this continent with the sleepers on which support the rails, and the great consumption of the forests which this occasions, it was suggested that the companies should cause large tracts of land to be planted with trees for their own use. They would, of course, plant only such sorts as would answer their purpose, and thus the rapid demolition of our forests would be arrested. Mr Wilson, of Boston, made some excellent remarks on this question, and cited, among other things, the example of the *American Pacific* line, the directors of which have caused large plantations to be made.

10.—*Fruit-tree cultivation.* Strange to say, in spite of the presence of men like Messrs Beadle, Dupuis, and others, well capable of speaking on this subject, hardly a word was said about it.

11.—*Climatology and care of forests.* These questions were not treated separately, but were mixed up with other points in different papers that were read to the meeting.

12.—*Necessity of education in forestry.* Full treatment was afforded to this subject by Mr Loring and the Minister of Education of the United States. To impress upon youth the importance of forestry being a worthy branch of education, must be the first step, if we wish to arrest the destruc-

tion of our wood lands. This is what the *Journal of Agriculture* is perpetually striving after.

Several other papers were read, and I must not close my report without referring to Dr Chas. Mohr, of Mobile, who read one of the most elaborate essays submitted to the congress.

The honourable Mr Loring, President of the meeting, and Commissioner of Agriculture in the United States, read two papers of remarkable excellence: one on forestry, and the other on agriculture in general.

We now can form a general idea of the subjects gone over by the congress. Let us see what conclusion we can draw from its labours:

1. The land-grants to settlers should be so made, that part of each farm shall be retained in wood in perpetuity.

2. Lumbermen should be compelled to leave standing all trees of less than twelve inches in diameter.

3. Clearing land, and felling timber for commercial purposes, should be so arranged, that the burning of brush and of the chips and waste of the lumbermen shall only take place at certain fixed times.

4. The sale of public lands should be so regulated, that those which are unfit for cultivation shall remain in the hands of government, as forest lands to be out in regulated succession.

5. A special police should be appointed to see that all the forest laws be observed, and to put a stop, as much as possible, to all fires and other kinds of destructive accidents.

6. Replanting to be encouraged, whether by seed or transplantation; and some sort of prizes to be offered to that end.

7. Addresses should be presented to government, inciting the chief ministers to put the suggestions of the congress into operation as soon as possible.

Nobody, looking at this programme, can be tempted to say that the congress whose work it is has been wasting its time. Nothing is more sure, than that good, any great good, must arise from these resolutions wisely pondered and carefully carried into execution. Our governing bodies have the ball at their foot: it is for them to see that it is properly directed to the goal. Be it our part to aid them, by forming associations for the purpose in this province, as the inhabitants of the United States have already done.

Now is the time, while the attention of the public is awakened, to work together for the establishment of a "Canadian Forestry Association." I firmly believe that such a body has a great work before it, a work productive of immense benefit to our country, for by it the destruction of our wood lands by the axe of the improvident woodcutter will be permanently arrested.

Before I finish, permit me to say a word on the Canadians who took part in the deliberations of the congress. If the United States were well represented, the Dominion of Canada, and our province in particular, made no default. Let me begin by naming Mr Joly, president *pro temp.*, who took a very active part in the discussions, and Mr Little, vice-president, to whom is due the thorough organisation of this year's meeting. Besides the honourable Messrs Ouimet and Mailhot, there were present Messrs Taché, Dupuis, Massue, Dr Painchaud, and others, many or whom took an active part in the various discussions. I will wind up by a wish: may we have it in our power to publish for the benefit of our readers the most noteworthy papers which were read before the meeting, for they treat of questions of the greatest possible interest to all those who feel an interest in the preservation of the splendid wood-lands of the province of Quebec. J. C. CHAPUIS.

*From the French.*

### The Society for the Promotion of Agricultural Science.

As I mentioned in the last issue of this Journal, the American Society for the Promotion of Agricultural Science held its third annual meeting at Montreal on the 21st, 22nd, and 23rd of August. Whether owing to a lack of interest in the objects of the association, to the great press of work in the hayfield, or to the want of advertising the meetings in the papers, I know not, but the attendance was very scanty: fourteen only were present at the Monday morning session, and not more than thirty on the Tuesday morning. Amongst the company, not members of the Society, I only observed Messrs E. A. Barnard, Director of Agriculture, Chapais, Painchaud M. D., and Wm. Evans, all the rest, as far as I could judge, were from the States.

Mr Freeman, in an article, published in *The Fortnightly* for August, speaking of the impressions he had formed during a recent tour in the States, says that he found not the slightest difficulty in understanding any of the speakers there. For myself, I must confess that Mr Freeman was more fortunate than I. Except as regards a few, among whom I may mention professors Kedzie, Real, Sturtevant, and Arnold, the enunciation of the readers was so rapid and indistinct, that it was with the greatest difficulty I could follow the arguments; and when it came to figures, the difficulty became an impossibility. The final consonants seemed to be left to take care of themselves; and the tongue, teeth, and palate, without a full use of which organs no public speaker can convey his words to an audience without inflicting upon them a terrible amount of overstrained attention, were entirely unused. In fact, I remarked that one gentleman soon left the room, so utterly incapable was he of understanding the address of the then speaker. How the pupils of the different universities manage at the lectures they attend is a puzzle to me, but, as use is second nature, I suppose they guess at the words; the reporters, I presume, made up their matter from the MSS. of the essayists.

I subjoin a corrected report of the lecture on "The Sources of the Nitrogen in Plants;" and I beg to thank professor Kedzie for his great goodnature in complying with my request for it. As I observed last month, some of our Montreal papers made him say the very reverse of what he intended.

Professor Goessman's lecture on "The Mineral Constituents in Plant growth," read by professor Penhallaw in the unavoidable absence of the author, traced the growth of our present knowledge of these constituents from its earliest sources. He showed that up to 1830 a general ignorance on the subject prevailed, even among scientific men, though Sir Humphrey Davy had a considerable insight into the facts of the case. As late as 1830, Sprengel asserted that bone-dust was of no use as a fertiliser, and ten years later, Dumas, the celebrated French chemist, considered the mineral constituents of plants a mere incidental feature in the vegetable economy. (1)

An account followed of various experiments on the use of different fertilisers on vines and strawberries.

The next paper was on "Our Animal Plagues, and the Means of Controlling them," by Mr Salmon, Veterinary Surgeon. A most interesting paper, following closely in the footsteps of the great Frenchman, Pasteur, whose inoculation experiments have won for the investigator the highest reputation among scientific and practical agronomes.

It seemed to be the opinion of the meeting, that the argument in favour of vaccination (as stated by Mr Barnard on

(1) Observe; bones, lime, marl, and ashes of wood, turf, clay, and coal, had been all largely used long before this time. Here, as in many, I might say in all cases, practice employed, before science explained.  
A. R. J. F.

behalf of Dr Painchaud, of Varennes,) namely, that there is no danger in using vaccine, provided that it has been properly selected and carefully treated, is scientifically correct. If nothing but the vaccine be removed from the vesicle, there is no danger incurred in using vaccine from a subject having other (*non-contagious*?) diseases. (1)

A paper on the germination of seeds gave no new facts on the subject. Much, in my opinion, depends on the quality of the land and its state of fineness. Beans (our horse-beans. I mean to say) I have known come up from a depth of seven inches, melons at four inches, and wheat is commonly ploughed in to a depth of four inches in some of the peaty soils in Berkshire, England, and does well. Here Mr J. J. Thomas says, "beans do not reach the surface at a greater depth than four inches, and wheat sown two inches deep produced plants of diminished vigour, decreasing in strength as the depth increased; which is strange, as in England, autumn wheat is always put in on light soils at least three inches deep, if it be possible. This, as in fact most of the papers were, was more suggestive than conclusive.

#### TUESDAY AUGUST 22ND.

After professor Kedzie's paper on the "Sources of Nitrogen in Plants," for which see p. 84, Dr Caldwell, of Cornell University, addressed the meeting on what the Germans have called "The Maintenance Ration," i. e., the quantity of food substances on which an animal can be kept without increase or diminution of weight. The results obtained by professor Sanborn, at the New-Hampshire Agricultural College, go to show that the German ration is larger than necessary; but the subject is full of difficulties, and brings up the whole question of the real value of food grown in different countries, or in different districts of the same country. I have often insisted, in this Journal, on the curious but incontrovertible fact that swedes grown near Brighton, England, will only keep sheep going, while the swedes grown near Shoreham, only 15 miles distant, will fatten them. Therefore, I am inclined to think that when the animals under professor Sanborn's care gained 1.37 lbs a day on the *maintenance ration* of the Germans—and on even less—there must be some strange difference in the quality of the two foods, in the time of year in which they were used, in the influence of the two climates, or in the quality of the animals on which the experiments were tried. Anyhow, a consensus of opinion on the point can only be had after an interchange of trials and visits of inspection between the two continents. Sir John Lawes, to whom I have written on the subject, will probably let us hear his opinion before long.

Mr Gulley's valuable paper, on "The food value of Cotton seed," followed, and is, I think, worth printing *in extenso*: I will not warrant the absolute correctness of the figures, but I believe there is very little fault to be found with the reasoning.

#### FOOD VALUE OF COTTON SEED.

F. A. Gulley, Professor of Agriculture at the State Agricultural College of Mississippi, then read a paper on the "Food Value of Cotton Seed." The crop of cotton seed amounts to 3,000,000 tons or 180,000,000 bushels. During the past year it is estimated that the oil mills consumed 180,000 tons of seed in the manufacture of cotton-seed oil, while less than one-half of the remainder was used for fertilizers, seed, and feeding stock, the balance being a total loss. In the manufacture of oil a ton of seed yields from 35 to 40 gallons of oil and 600 to 700 pounds of oil cake. The husk or hull of the seed, which was removed before the oil is ex-

(1) Dr Emery Coderre would probably deny this conclusion, but the weight of evidence, and the almost universal practice of the medical profession, are against him.  
A. R. J. F.

tracted, constitutes about one-half of the total weight of the seed. Formerly the oil was all exported to Europe, and used for a cheap table oil. It is now used as a lubricant, to mix with paint oils, and to adulterate the so-called olive oils, three-fourths of which it is estimated are now the product of the cotton seed. Its greatest value, however, is for culinary purposes; properly refined and skilfully used it is equal to the best lard for cooking purposes. Cotton seed cake or meal is especially rich in nutritive matter, and is the most valuable vegetable product we have for combining with the coarse forage of the farm for the production of fat on the animal, or the making of rich manure; one ton of the meal being equal to four tons of corn for the latter purpose. The whole cotton seed, as it comes from the cotton gin, when cooked, makes a valuable food. Estimating the cotton seed at ten cents per bushel, the cost price, delivered at the college barn, and oat straw and coarse hay at ten dollars per ton, the average cost of food consumed per head per day of the college cows during the past winter was seven and three-tenths cents, cows averaging one and one-half gallons of milk per day. Dry cows and yearly calves cost four and one-half cents per day for food consumed. One steer fed for beef, weighing 700 pounds when shut up, gained 260 pounds live weight, or an average of over four and one-half pounds per day, consuming an average of fourteen and four-tenths pounds of seed per day and eleven pounds of straw and hay. Average cost of food per day not quite ten cents, cost for whole period \$5.42. Another steer gained 240 lbs. in 49 days, consuming \$3.78 worth of cotton seed and hay. The experiments at the college show that boiled cotton seed with any kind of straw or hay will cause cattle to fatten rapidly, no matter how poor in condition. It also makes very rich milk, the oil of the seed seemingly appearing in the milk in the form of cream. The quality of the butter, however, when the cows are fed largely on cotton seed, is poor. The college is now preparing to test the value of cotton seed and its products for food and manure, on a somewhat extensive scale, hoping to establish approximately the value of the seed for these purposes.

"At the close of the meeting Dr Sturtevant, Secretary, read a letter of invitation to the members to visit Mr Thomas Irving's farm. He pointed out that this would be a good opportunity of obtaining a fair idea of a Canadian farm." Oh, confiding Dr Sturtevant! If you conceive that Logan's farm, Mr James Drummond's farm, and a dozen others I would mention on the Island of Montreal, can give you the slightest idea of Canadian farms in general you have a great deal to learn yet! It would puzzle Berwickshire or the Lothians to beat them.

ARTHUR R. JENNER FUST.

Professor R. C. KEDZIE presented a lengthy report on the source of nitrogen of plants. The professor opened his remarks by stating, that there must be a large supply of combined nitrogen from some source to make up for the heavy annual loss, or else the supply of this necessary material for plant growth must diminish year by year, and starvation from failure of plant growth from want of combined nitrogen would be only a question of time. This annual loss is caused by three sources, viz.: combustion of nitrogenous materials, in putrefaction and decomposition of organic substances, and the enormous quantities of nitrates that are yearly formed in the soil, and by the rivers washed into the sea, and lost so far as land vegetation is concerned. The loss from all these sources is so great that the world's supply of combined nitrogen would have been sensibly diminished, if not exhausted, within historic times if nature did not in some way counteract this enormous waste. It is claimed

that compensation is made in two ways: 1st, by the atmospheric supply furnished in rain water in the form of ammonia and nitrates: and, secondly, by chemical action in the soil, but neither seems to be sufficient to supply the demands of growing crops, and to make good the natural waste of combined nitrogen constantly going on. Two propositions have been laid down as axiomatic:—1. The composition of the manure must be determined by the composition of the plant, if the latter is especially rich in phosphorus, potassium, nitrogen, etc...then the manure must contain corresponding quantities of phosphorus, potassium, etc.

2. The exhausting influence of any crop is to be measured with reference to any element by the amount of this substance which the crop removes from the soil.

Still these propositions often break down in practice. Thus, in actual practice, we find that, in opposition to these rules wheat is specially benefited by increased supplies of active nitrogen, whereas clover is not appreciably benefited thereby. So far as nitrogen is concerned, these seemingly self-evident truths are found to be false. A crop indifferent to nitrogenous manures removes the largest amount of nitrogen during its growth, and is, notwithstanding this, the best preparation for a crop requiring an abundant supply of combined nitrogen for its full development. How can we explain this anomaly?

If clover cannot obtain its supply of nitrogen from the free nitrogen of the air, how, it may be asked, does it derive its large supply of nitrogen under circumstances where wheat would fail to secure its smaller supply? It must find in the soil some form of combined nitrogen from which it may derive an adequate supply, while wheat, though requiring less nitrogen, would be quite incapable of supplying itself from the same soil.

The question now comes up, does the clover find in the nitrogen of the *humus* of soil a supply of nitrogen for its development while wheat would fail to obtain its smaller supply from the same source?

This species of plant food contains a large quantity of nitrogen, which has been called "the latent nitrogen of the soil," which is usually regarded as incapable of supplying plants with nitrogen, as it cannot be driven off in the form of ammonia by heating with alkalis. One remarkable fact connected with this humus is, that however small the amount of nitrogen in the vegetable material out of which the humus is found, the humus itself contains about two per cent.

In order to settle this question I devised a series of experiments on the general subject of nitrogen supply for plant growth, with especial reference to the inert nitrogen of the humus of the soil, in which clean sand was used, as the mechanical element of the experimental soil, from which all forms of combined nitrogen had been carefully expelled by heat; swamp muck as the humus; freshly ignited wood ashes and a pure superphosphate of lime to represent the mineral elements of plant growth; the soil being placed in new flower-pots and kept in a glazed room, but freely exposed to the air and watered with distilled water free from ammonia, in which medium red clover, wax beans and Clawson wheat were planted, it was found that in the early stages of growth the wheat plants came forward vigorously, promising to outstrip the others. This continued until the supply of plant food in the seed was exhausted, when the growth was somewhat checked and many became sickly and weak. In the best pot of wheat, four plants had two stalks each, the roots of which made a firm mat all around the inside of the pot; there were two or three nodes in the stalk, but no formation of head. The beans made good growth and full development, although slow to start. They grew 15 inches high, with six pods and eighteen beans. The red clover grew feebly at first, but soon manifested an astonishing vigor. The best plant had eight

stalks, measuring from 26 to 30 inches in height, with 16 blossoms and a great number of vigorous leaves.

The entire weight of the dry wheat plants was 39 times the weight of the original seed, while the clover plants weighed 3176 times as much as the original seed.

No attempt at generalisation is made, because the plants have not been analyzed to determine the absolute gain of nitrogen; also, because these trials are only tentative, and are to be repeated with greater care and on a more extended scale next year.

A. R. JENNER FUST, Editor Journal of Agriculture.

*My dear Sir,*—Your esteemed favor of 25th is received. No man should be held responsible for the work of a reporter unless he can read the "proof." I confess I hardly recognize my ideas in some parts of the report you sent me. I am not a disciple of Ville, and in my article I distinctly said that the results reached by Boussingault, and by Lawes and Gilbert, were every where received as scientific truth, except by the followers of the French School of Ville.

I consider however the classification of plants into nitrogen-producers and nitrogen-consumers made by Ville, an important one and having a substantial basis. The error of Ville was in assuming that the nitrogen-producers derived their excess of nitrogen from the air. What I seek to establish is, that clover is a nitrogen-producer by obtaining its surplus of nitrogen from the "inert nitrogen" of humus in the soil. I do not consider this proposition established and would be very cautious in announcing such result, but my experiments and investigations have this as the objective point.

If this proposition can be established it will be an important step in explaining rotation of crops, and give us some insight into the influence of one crop as preparing for a succeeding crop.

I am under great obligations to you for an opportunity of correcting some of the errors in the report of my essay, and of spreading the correction in a publication so widely known and so influential as the *Journal of Agriculture*.

I remain your obedient servant, R. C. KEDZIE,  
Prof. Chem. Agric. Coll. Mich.

P. S.—I should be pleased to receive a copy of your Journal containing the corrected report.

Faithfully, R. C. KEDZIE.

### Jersey Cattle.

Mr Harrison Stephens, whose farm I visited on the 2nd of September, has, as most of my readers know, the pleasure, and I hope the profit, of being the possessor of a small herd of Jerseys. The estate, 150 acres, is situated on the south bank of the St. Lawrence, and, like most of the neighbouring farms, is almost on a dead level; the part abutting on the river being a stiffish loam, and the other end changing into a much lighter soil. The crops I found uniformly good—the oats almost too good, some stalks measuring six feet in length. Mr Stephens expects this season to realise 1,000 bushels of oats, and 12,000 bundles of hay; and from what I saw, I do not think he will be disappointed. The aftergrass is abundant, and it was curious to see that the cattle refused to touch the green fodder corn which was cut for them, so plentiful was their more natural food: a rare case on a Quebec farm at the end of August! There was a good deal of wiry looking grass in the pastures, which seemed to indicate drainage, but I could not find much fault.

There are, it seems, only a few herds of Jerseys in Canada: Mr Whitfield's, at Rougemont; Mr Fuller's, at Hamilton; Mr Cochran's, Mrs Jones', Mr Reburn's, and Mr Stephens'; but I fancy we must add a small one at Mr Barnard's, Cap St. Michel, which is only just begun, with a view of crossing with the old Canadian (Breton) breed. Mr Fuller conceives that the future of the Jerseys is so promising, that he does not mind giving \$2,500 for a bull! If they are bred for size, vigour, and milk, instead of for fineness of bone, colour, tail, horn, and the nume-

rous absurd points which the breeders demand even at dairy shows, they would make as good farmers' cows as the Guernseys; but if people run away with the *points* madness, they will be as surely spoiled as the modern Dorking fowl has been ruined by the craze for *feather*.

*Cheerful*, the queen of the St. Lambert's herd, is a fine, large-framed animal; whole coloured, as they all are, with black points. There is the strongest possible family likeness, the *plus ou moins* blackness of the face being the only distinction in colour. The udders of all are above mediocrity, though none are wonderful, one of the best having but one quarter left out of the four, from careless milking. What a scandalous shame!

*Cheerful*, tracing back to "Stoko Pogis" and "Rioter," is the dam of a nice yearling bull, who will be used in the herd for the future. There is another niceish bull-calf out of *Lucy*, but the young stock seem to be generally sent out to keep when weaned, and, as a whole, were disappointing.

A half-bred 2 years old heifer, out of a nearly black Canadian cow by a Jersey bull, was shown me by one of the neighbouring farmers. She bore the impress of both sire and dam very markedly, and will make, if again put to a Jersey, the commencement of a very fine family, provided she bears heifer calves. The Canadian dam looked as if she could testify upon oath to her descent from French ancestors—both were in high condition, but then the grass was up to their knees.

A country-bred cow, kept for the use of Mr R. Stephens' family, spoiled the look of the Jersey herd as a whole. It was a pity to see her there, as the others would have been as taking again if they had been alone.

The dairy was clean and well kept; the oldest milk how-  
ever was sour though only 20 hours from the cow (1). Set in common earthenware pans, with no ice used, it is impossible it should be otherwise in such hot weather. The ice-house being at the *side* of the dairy does not seem to influence the temperature much; if it were above, and the water from it ran through the dairy, I fancy there would be a difference. However, as Mr Stephens gets 30 cents a pound for his butter, there cannot be much wrong, but it is strange that in my cellar, in Mountain St., the milk brought six miles into town has kept sweet all this summer for 24 hours!

Mr Harrison Stephens has *no opinion of the Guenon theory*.

ARTHUR R. JENNER FUST.

### De omnibus rebus.

*New Steamer*: I have given the new apparatus for cooking by steam, of which I spoke in the last number of the Journal, a full and fair trial. The plan is simplicity itself, as it requires no more heat than the top of an ordinary cooking stove affords, and the work it does is perfect. Porridge, whether of oatmeal or cracked-wheat, requires no attention at all; if a sufficient quantity of water is mixed with the meal, the whole is absorbed, and the porridge turns out as thick as is desired, instead of, as is too often the case, being soft and *pappy*. Rice and milk is cooked of a far better colour than by boiling; pease-soup runs not the slightest risk of being burned; potatoes and other vegetables are steamed to perfection; the water converted into steam does not drip back again on the materials after condensation; and, lastly the supply of water can never run short, even with the utmost negligence of supervision.

The steamer is not yet on the market, but I have strongly

(1) The milk did not seem to me either superabundant or very rich, but I fancy the cows had calved a long time.

recommended Mr Cole, of Notre-Dame St., to buy the patent, and I believe he will take my advice.

**The English Harvest:** At last our brothers in England have a turn in their favour. Wheat, of which 100,000 acres were sown more than last year's crop, judging from the reports in the *Agricultural Gazette*, the *Mark Lane Express*, and the *Daily News*, is above an average crop; oats promise an extraordinary yield; barley is over an average; pease and beans very much over an average; hay an enormous crop, one-fifth of which is damaged by rain, or as one correspondent says: "we have a large crop well saved, and half a crop stained." Potatoes are a full crop, but the rains have caused much disease. Expected yield of wheat, 10,500,000 quarters, or 84,000,000 imperial bushels; so that the importation required will be about 14,000,000 quarters, equal to 112,000,000 bushels, a quantity which the great crop in the States and the general abundance over Europe will have no difficulty in supplying.

The aftergrass, too, is abundant, and indeed all the summer the pasturage has been first-rate in quantity and quality, so a very large make of butter and cheese may be expected. Meat is scarce, and good mutton, Downs and half-breds, is fetching high prices. Shall we never send a shipment of good Hampshire Downs to England?

The Persian insecticide, *pyrethrum roseum*, does not answer its intended purpose, at least as regards my insects. The housefly laughs at it, and the *aphis vastator* declines to be inconvenienced by submersion in it. Probably, it is too old, or too new, too damp, or too dry!

Five car-loads of cattle &c. from the Whitfield farm went to the Toronto show. How many may we expect at Milcend? I hope some one of the judges of the polled-Angus may know that squareness of build is not reckoned a beauty in that breed though it is in a Shorthorn.

No prizes offered for Galloways! Are we to conclude that the committee thinks there is no difference worth mentioning between Galloways and polled-Angus, and so has lumped them together? This evidently was the case last year; for Mr Hickson's bull showed as a polled-Angus, and was decorated.

And how many of the judges of cattle employed in the exhibition grounds had ever seen a polled-Angus before last September? There are plenty of good men in the States, qualified to determine the relative merits of Jerseys, Guernseys, Herefords, Devons, and polled-Angus; but it is hardly to be expected that they will come here for *five dollars* and pay their own expenses!

The Southdowns, too, want looking after. A man may be a first-rate judge of Cotswolds, and be utterly incapable of distinguishing the finer points of other breeds, and the reverse. For example: My dear old farmer-tutor, William Rigden, considered to be, after Jonas Webb, the best judge of Southdowns in England, went up to Norwich with me to judge sheep. After placing the Southdowns, when the Cotswolds and Leicesters appeared in the ring, he retired from the function, saying that, though he knew the general points of a sheep as well as most people, he had not sufficient experience to decide on those breeds: *Modestia impareggiabile!*

It was not bad of the Gazette saying that, at the meeting of the Association for the promotion of Agricultural Science, professor Haughton read a paper on *Infanticides!* The re-

porter had been reading the "Heart of Midlothian," I suppose, and had been deeply impressed with the story of Effie Deans.

**Gas Waste Products:** Dr Siemens stated at the last meeting of the British Association for the Promotion of Science that the annual cost of the coal used for making gas is about £5,400,000; but the by-products derived from it, besides the gas—such as, colouring matters, creosote, pitch, ammonia, crude carbolic acid, coke—are worth £8,370,000, or nearly £3,000,000 more than the coal costs!

**Shropshire Sheep:** This year, Mr Beach's best 3 rams fetched, respectively 100 gs., 140 gs., and 170 gs. The total amount realised by the 27 shear-rams was 760 gs., an average of £31. 1s. 1d., a higher price than was obtained last season.

Mr Minton's averaged £28. 3s. and Mr Evans' of Uffington £24. 12s. 6d., Lord Chancellor being bought by Mr Loder, M. P. for 99 gs.

**Price of Wheat in England:** Good new wheat is bringing from \$1 32 to \$1. 44 a bushel. Many of the samples are of superior quality, and weight. The French harvest has been satisfactorily gathered, and Spain and Portugal seem the only European countries in which the yield of grain is deficient.

Hops are going up in price, good samples of last year's crop being worth £14. 14s. a cwt., or 62 cents a pound. As from 2½ to 3 pounds are used to each bushel of malt in the great Burton "Bitter Ale" breweries, this is a serious matter for beer drinkers.

A. R. J. F.

#### Canada Jerseys—A Protest.

EDS. COUNTRY GENTLEMAN—I am completely thunder struck at what I have this moment heard, that at the September meeting of the Jersey Club, to be held in New-York, a motion is to be brought up, that in future "no Jersey shall be admitted to registration in the A. J. C. C. H. R., unless said animal be bred in the United States, or else be imported directly from the Island of Jersey." If this is true, it is the most unjust and narrow-minded proceeding I have ever heard of. You will see yourselves that it would be the ruin of our little band of Canadians who have fought so good a fight in the Jersey cause, and have fought it for the benefit of all Jersey breeders, not of Canadians alone.

Take my own case as an example: I went to your country and invested large sums of money in buying the very finest herd of Jerseys I could get together. Every animal I have ever sold has given satisfaction and reflected credit upon the American breeders of whom I bought my stock. When our government prohibited the introduction of American cattle into this country, thereby hurting your breeders, I went directly to Ottawa and had a personal interview with our premier, Sir John McDonald, who is also my very good friend. I laid the matter most strongly before him, and before Hon. Mr. Pope, Minister of Agriculture. Mr. Fuller, one of our leading gentlemen, worked even harder than I did, ably assisted by the Hon. J. J. C. Abbott. After long and assiduous labor, we, in a measure, gained our end, and can now bring your cattle into this country after a three months' quarantine. And we have a quarantine at Sarnia, in the west, as well as one at Quebec in the east. And even *this* restriction we hope to do away with in time.

Take also the case of Mr. Valancey E. Fuller of Hamilton. His efforts in the cause have been even greater and more suc-

cessful than mine. His endeavors to educate the Canadian public as to the merits of the Jerseys, and so induce a large demand for good cattle, have been untiring; for, as you must know, we have but a handful of registered Jerseys in Canada. Mr. Fuller's judgment is good, and his liberality extreme. He purchased Bertha Morgan from your country for \$2,500, and had to quarantine her for three months at a far distant point before he could get her home. Now, do you want to shut out purchasers of this sort from your markets? Do you want to deprive yourselves of the future descendants of such a cow, simply because bred in Canada? I cannot think that the Jersey Club will stain its annals with such an act of despotism. Our Canadian Society was formed, not as antagonistic to yours, but as its friend and ally, to educate our people—awaken their interest and invite their demand for Jersey stock. Is it possible that those gentlemen whose interests we have striven to forward equally with our own, and to whom we have paid our money with implicit faith in their honor and integrity, should now turn against us, and render our cattle, for a long time to come, virtually useless? I will not believe it. I call upon every gentleman belonging to the American Cattle Club, many of them my personal friends, to set their faces against a measure as unjust as it is illiberal; and I beg my many friends, in nearly every State of the Union, to use their influence in our behalf.

E. M. JONES.

*Belvedere, Brockville, Ont.*

### On the hardy fruits of Northern Europe,

BY CHARLES GIBB, OF ABBOTSFORD.

This work of looking up the fruits of the Continental climates of central and eastern Europe is a work wholly new: a work from which we may expect great results.

The hardiness of a variety is not dependent upon place of birth but upon hardy ancestry, and hence it is that we find even in England and France, under English and French names, apples of that early terminate growth and thick pubescent leaf which show pure Russian or Astrachanica descent.

At Reutlingen, in Wurtemberg, we find the perry and cooking pear to be of a different race from those of Western France, whence American nursery-men have obtained their pear roots. Reutlingen is a fruit-growing neighbourhood, and, on account of its elevation, cold above its latitude. The orchards, here, have suffered severely during the last unfavorable winters, but these pear trees have stood the test much better than the apple.

At Vienna, we find a race of apples, wholly new to us, with very thick, small, plicated leaves, natives of Transylvania. Some of them grow from cuttings like currants. They are very productive and some of them are late keepers.

In Bohemia, we found the fruits adapted to milder climates. One pear, however, Mr Budd noted as having that dark, thick, pubescent, smooth-edged leaf, which showed its descent from that hardy race, the snow-pear of Northern China. In the colder parts of Silesia, we found this pear, the Salzburg, grown in quantity, and considered their hardiest variety.

The fruits of Poland were very interesting. Many of them are of native origin and quite unknown in Western Europe. The climate of Warsaw is milder than one would expect from its high latitude and its distance from the sea. However, in the nurseries, and in the gardens of the Pomological Institute, we, for the first time, met with collections from the Russian steppes, and carefully noted the opinions expressed about each of them. The Antonowka and Titowka seemed the most popular of the coast-section apples. The hardiest good pear they have in the Sapiieganka. Of this

we saw trees two feet diameter of trunk, growing in the cold climate of Wilna.

At Riga, we found that many of the favorite apples of Northern Germany were lacking in hardiness, and that selections were made mainly from the Russian steppes. Here, the trees and shrubs in the nurseries were less *European* than any seen hitherto—largely Asiatic.

At length, we arrived at St. Petersburg, in latitude 60°, the same latitude as Cape Farewell in Greenland. So far north, that for nearly two months during summer the stars, even at midnight, are not visible. The sun is too short a distance below the horizon. The winter, here, is hardly as severe as in Montreal, yet its rapid changes are very trying to vegetable life. The one necessary point in an apple tree, here, is early terminate growth. We are, here, too far north to gather information upon tree fruits. However the Botanic gardens are wonderfully complete. The trees and shrubs of Central and Southern Europe have usually failed, and have been replaced by collections from Northern Turkestan, from Southern Siberia, Mongolia, Dahuria and the Amur district. The thick-leaved poplars of these dry climates I believe to be especially valuable in the drier parts of Canada.

The market, here, is supplied with cherries from the cold region of Vladimir, East of Moscow. This Vladimir cherry and the Ostheim, are better fruits than the Early Richmond and Kentish, and can be grown in much severer climates.

Within a day or two, we shall have reached Moscow. There, we must pause for study. We have carefully prepared lists of the fruits, trees, etc, grown at the pomological schools and nurseries we have visited, and we must now employ translators, and do what we can to disentangle the confused nomenclature of Europe.

Our work, here, has created some interest among the Russian horticulturists, and the Canadian and American governments are congratulated on their enterprising spirit.

The Russian government will probably send a commissioner to U. S. and Canada for a like purpose next year. Nothing can exceed the kindness of those in charge of their Agricultural Department. They give us every facility for following the somewhat difficult task we have undertaken, and question us closely, and even request their horticultural schools to question us, as to the fruits, trees and grains of our continent, which we think might be useful in different parts of their vast empire.

The fruits we are bringing to light will be imported, propagated, and scattered abroad in Iowa and in other Northern prairie States. Ontario will probably do something for her Northern counties. When will our own province have a propagating centre, where the fruits adapted to each county may be propagated and distributed to each county as prizes by the County Agricultural Societies?

Such work is work worth doing, and should be done.

St. Petersburg, 14th Aug. 1882.

Mr Fortin's plan for the utilisation of the refuse of the Gulf fisheries is worthy of attention. In England, to-day, fish guano, as it is called, is recognised as the cheapest source of nitrogen in the market. Mixed with a fair proportion of superphosphate, made from our own apatite, it would be a superb fertiliser.

A. R. J. F.

### Judges and Judging at Exhibitions.

The advent of every exhibition suggests the question, which is a pertinent one, to the executive committees of all Agricultural and Industrial Associations: Where are we to







find satisfactory judges? It must be confessed, that on the standing and character of the judges, and on the amount of confidence the public, and particularly the exhibitors, have in their fitness and impartiality, depends in a great measure the success of all such undertakings. How often have we heard exhibitors affirm that, unless better judges were appointed another year, they would not exhibit again.

Our remarks are intended to apply more especially to the Judges of Live Stock.

Let us consider first. What are the qualifications necessary to entitle a man to be appointed to the honourable and responsible position of judge? honourable it should be, as he is specially selected from among his confrères to fill a position of trust, in which his honour and impartiality are relied upon; responsible it certainly is, as not only is he intrusted with the disposal of public funds in the shape of prizes, but his awards have a far more important bearing on the value of the animals submitted to his judgment. In the first place, he should be a man of unimpeachable integrity—a man whose word is as good as his bond—he should be familiar with the class of animals which he is to judge; he should not be an exhibitor, nor the intimate friend of an exhibitor.

A very common popular error exists, that a person who is "a good judge of horses" as the term is generally used, one who knows a good horse from a bad one, is capable of judging any class or breed which may be brought before him, and too often executive committees entertain the same views, and the consequence is that the same judges decide the relative merits of all the different classes, the absurdity of which is apparent to all who are really connoisseurs of the different breeds. Thus we may find a man who, from long experience and careful study, has become an adept in judging Clydesdale horses, with their wide chests and quarters, large hairy legs, thick round shoulder and barrel, who would, were he to carry his ideal of points of excellence to the class of thoroughbreds, make such blunders as would render him ridiculous. The different breeds are so characteristic, and so different from each other, that it is rare indeed to find a man who can correctly and satisfactorily adjudicate between them.

The same remarks hold good in cattle, sheep, swine, and poultry, as well. Thus, what judge of Short-horns would undertake to judge Jerseys? in which the points are so diametrically opposite; each breed has its own peculiarities in conformation and distinctive characters of the breed—and these are subjects of special study—and it is rare indeed to find a person sufficiently well versed on all, and sufficiently free from the prejudices of his fancy, to entitle him to be considered a judge of each breed. So with poultry; the enthusiasm of poultry fanciers, and their predilection for their own special breed, is such that they ignore any good points in others; and it is a fact, that, on the whole American Continent there are only a very few men who are recognized as competent to judge all breeds—and these men make it a study and a business.

How then should judges be selected? If we are right in attaching so much importance to the judges as to look upon them as a very important element in the success of an exhibition, it is clear that nothing should come in the way of procuring the best to be found. If we are right, that they should not be exhibitors, nor friends of exhibitors, then we must invite them from a distance. If men cannot be found to judge all classes correctly, then by all means get men who are specialists for each class, and pay them for their time and trouble. We are not sure but it would be the better plan to have but one efficient judge in each class, a stranger, well paid who would be free from all local, friendly, or poli-

tical leanings. (1) How are such men to be found? very easily! let the permanent Exhibition Committee appoint a standing committee of three, whose special business shall be to discover good judges, and with power to invite them—by communicating with the executive of other exhibitions in Canada and the United States, a list of experts for all classes could be kept, which plan would save an immense amount of trouble, and certainly prove more satisfactory than the present penny-wise system of confining our selection to the province—which of necessity involves questions of friendship and politics, and the appointment, in many cases, of men who have no special qualifications for the positions they are invited to fill.

The position of the judges is by no means an enviable one, and we know of no volunteer service in the public interest which is not only so utterly thankless, but which submits them to so much inconsiderate abuse.

The public should bear in mind that the judges are gentlemen who sacrifice their time to act as umpires; that they are on their honour, and it is very foolish to suppose that three men, who after careful examination and consultation together agree to an award, have any motive but to do justice to the best of their knowledge. If their knowledge is defective, it is not their fault, but the fault of the system under which they are appointed. It should be understood, too, that the executive in no case interferes with the awards of the judges; no one guides them; no one dictates to them; and the only advice they are allowed to take is that of the Referee who may be called in in cases of dispute as to age or soundness.

The rule for punishing any exhibitor using insulting language to or interfering with the decision of the judges or referees, by expelling them from the grounds and preventing them from exhibiting for a year, should be enforced in all cases. The judgement of the public collected around a horse ring is far more apt to be erroneous than that of the men who are engaged in a close, critical examination and comparison; more especially when they remember that they cannot know all the circumstances which lead to the decision of the judges: thus we remember assisting as a judge at a Western exhibition, where a very fine pair of carriage horses were competing in the ring, which for style and action were decidedly entitled to the premium, but to the disappointment of the on-lookers, no prize was awarded! It was then explained to the bystanders that one of the horses was ornamented with a false tail, and the other had a white star dyed! It will thus be seen that outsiders should not find fault with judgements of which they do not know the moving causes.

A word in closing to the judges may perhaps not be out of place here.

Judges should not themselves discuss the merits of animals with their owners, nor should they allow themselves to be talked to on the grounds by owners or their employés as to avoid the very suspicion of collusion. They should in all cases insist on the ring, during judging, being kept clear of any but themselves and necessary assistants. In all classes, they should practise arriving at conclusions by comparison of points, age, sex, size, weight, colour, conformation; condition, action, and soundness, being carefully considered, and in all cases of dispute or uncertainty as to age or soundness, they should call in the referee of their class.

The judge with trotting proclivities should distinguish between the six-mile an-hour action of the carriage pair and the whirlwind like rush of the trotter or trotting roadster.

In all cases of mares and stallions, diseases or conformation of a hereditary nature should be specially objected to, as the judges ought to remember that the awarding of a pre-

(1) The plan has answered well in England and Scotland.

mium to breeding animals carries with it a recommendation of those animals for breeding purposes.

D. MCEACHRAN.

In another letter, dated September 6th, Professor Kedzie informs me that, "regarding the experiments with plants grown on humus deprived of ammonia, I would say, that the investigations undertaken have not been continued long enough to make it seem proper for me to direct attention to them through any scientific publication."

#### AGRICULTURAL LETTER.

PARIS, JUNE 17.

Denmark is very justly proud of her reputation for good butter: the mark is appreciated wherever it is known. But as nothing succeeds like success, Denmark wants to become celebrated for her skim-milk cheese: to achieve this end, she is tormented by American competition, and still more so, by her neighbors the Dutch. Butter farming cannot be financially successful save that a profitable outlet be found for thin milk cheese, in the event of the non-existence of a local demand. The average price of such cheese is about—3 cts. to 4 cts. per lb.; it reaches double that price in some seasons, Dutch makes realize as much as—9 cts. lbs. The principal outlets for second-milk cheese, are warm countries, as soft, rich cheese will not stand a long voyage.

In Denmark, there is no uniformity in the preparation of cheese, as in the case of that of butter; less attention is paid to variations of temperature, that which exercises so important an influence on the production of cheese; indeed, it may be a question, if, from the industrial point of view, Denmark is up to the mark in the commercial preparation of cheese.

In Germany, milk societies are the order of the day; they are constituted according to important legal formalities, and severe penalties are imposed on such members as transgress the statutes. The general lines of these milk associations are: the members accept unlimited responsibility; each farmer undertakes to supply daily a fixed quantity of milk, over and above that required for home and young-stock consumption. Milk from a diseased cow, the mouth and foot malady excepted, cannot be received, and the milk from cows after calving, must be delivered separately, pending a period of 15 days. If the milk arrive late, the farmer is fined, and if the cart containing the tins be not locked, the latter must be: the sender and the receiver have duplicate keys; the cart is never entrusted with the key. In winter these cows are covered with straw during the journey: in summer, with damp cloths; the van, too, must be hung on springs. Some of the societies include 160 members, each furnishing on an average the milk of five cows. As there must be different qualities of milk, are the farmers paid? They are paid alike, 10 per cent of cream being accepted as a minimum standard of richness. Every mechanical appliance has been tried to test the measurement of the cream in the milk, but without success. Personal and unexpected visits of officials to the farms at milking hours, and taking away, then and there, samples, are the only practical tests.

But while the percentage of cream in the milk allows of the yield of butter being estimated, there is no test to determine the production of cheese. The richer the milk in butter the less dense the milk, while the contrary is the case for cheese, because the matters rich in cheese, are held in dissolution. One of the rules of the milk associations is, that any milk which becomes sour in six hours after delivery, will be reduced in price 60 per cent. The milk is paid for

every month, never in advance; but the accounts are finally balanced once a year, and dividends declared, when the sales of cheese and fattening of pigs have been realized. The societies also undertake to supply pure milk to children, and it is becoming the practice to select the neighbourhood of these societies for "nursing stations."

Milk and cheese farming naturally bring in their wake pig rearing; this is not only the case in France and Switzerland, but notoriously in Denmark. The small pigs in that country are shipped to Hamburg, where they are killed, cured, and exported to England as bacon. The coarser animals are sent to Holland and the Rhenish provinces: indeed, some of the hams find their way to France as "Yorkshire" and "Westphalian." The trichina is closely connected with pork: the Academy of Sciences has been discussing the vitality of that parasite: Mr Fourmant asserted, that a morsel of pork affected with trichina was kept in brine pending fifteen months: it was then given to some mice, that died from trichina after eating it. In the uncertainty, then, which reigns, the popular remedy is the safest, that of well-boiling the meat; which the French ever do, whether it be healthy or diseased.

The Pasteur process of vaccinating cattle continues to make enthusiastic progress. Russia and Italy have sent veterinary surgeons to be initiated into the *modus operandi*, and have had nothing but success to note. There are two kinds of *charbon* malady; the one accompanied by fever and the other by tumors. Mr. Pasteur confined his discoveries to the first, while Messrs. Arloing, Cornevin, and Thomas, have applied vaccination to the second, and with equal success.

The beet crop has taken a considerable extension this year in France, and is destined still farther to extend, when the legislature settles the vexed question of distillation and the sugaring of wines. When wines require body, or to be "cured," beet sugar—never any syrup from grain—is added, which is duly converted into alcohol. Indeed, with beet sugar, a special aroma, a prepared color, and an unlimited supply of water, wine can be manufactured at will. The vineyard proprietors allege, that if the law does not check the preparation of artificial wines, the days are counted for classed natural brands.

The reports on the state of the crops cannot be more favorable, and this year promises to be one of plenty. If the yield of hay be light, the quality is good, and this is shown in the superior condition of the stock sent either to the shows or to the markets. The season will be a dry one, but taken with all its drawbacks, a tendency to drought is preferable to a constant dripping. In dry weather, plants perspire a good deal, and give off their watery vapor to the atmosphere: but in many cases we can correct a little the drawback: irrigation where practicable, green manuring, and especially that of the farm yard. For light soils, cow and pig-stye manure is most suitable: it is cool and retains humidity. If there be less consumption—or less waste, during a dry summer of the elements of plant food, more will be left for the following season.

Mr Rodinoff draws attention to the use of calcined earth as cattle-bedding. He covers some branches with clay, sets them on fire and the earth is baked; it must then be kept under a shed to prevent absorption of humidity. In the calcined form, the absorbent power of clay is naturally augmented; in that state, it is better fitted also to fix gases. It is more suitable for a sheep than a cattle shed, and, when employed in the latter case, a slight sprinkling of straw will be an improvement. The best litter is that which will absorb most urine etc.: in this sense, following Boussingault, bean, buck-wheat, and pulse-straws, are first, as they absorb 3 times their weight of liquid: wheaten straw, but twice its

weight, and dried earth, but one-half. The latter then is only four times inferior to wheaten straw.

There is nothing special to record respecting the phylloxera; the enemy is being bravely fought everywhere, and the means, sulphuret of carbon &c., autumnal irrigations, and last not least, strong manurings.

Mr Joulie gives some very sensible explanations respecting the laying of grain. It is popularly, but erroneously believed, that the laying of wheat &c. is due, to a deficiency of silica in the stem: analysis however, has shown, that this is not so, there being no perceptible difference between the laid and the standing stems. Corn is laid, because the stem or the foot is weak, and this weakness is the consequence of moist, warm weather, and the absence of sun-light; the latter prevents the elaboration of carbonic acid, to enable the plant to form cellulose, or sinew, which imparts solidity. The stem becomes not ligneous, but herbaceous and etiolated; it breaks at the base, from want of regular nutrition; it has "rickets," it is unable to support the upper part and ears, consequently the crop is laid and destroyed. This is not the same with grain laid from a wind and heavy rain.

#### A note for September.

The time has again come round for looking over and selecting the best, or casting out the inferior birds. No one can say to a certainty which will turn out the most valuable and correct in the end, for until maturity is reached and combs are developed, and spurs seen to be rightly placed on legs that show no sign of weakness, there must be some doubt. Still, feathers, figure, and the most striking characteristics of the various birds can be judged, and where there is the lack of any one essential, then there is the bird for the cook. It is a great mistake to keep an imperfect or delicate chicken, and one to pay for sooner or later, and in more ways than one, too!

To get one perfect fowl out of half-a-dozen chickens, is good work, though many people appear to act on the presumption that good or show chickens should only be seen in a yard where a carefully selected stock is maintained. This may be so, but, if the case, many "wasters" will have gone to pot before uniformity could be contemplated. Take, for instance, the Dorking fowl, with its remarkable feet, five perfect claws, legs naturally white and short, here is a probability of some mistake. Or take the Plymouth Rocks and Cuckoo breeds, and then the number of black and other strange-looking youngsters would astonish anyone who had only seen the breed as represented in the show pen.

Those who have to do with the live stock of a farm are prepared to find many of the same difficulties in the raising of chickens as they have experienced in the breeding of their animals. We know what a science it is to obtain or maintain a herd of cattle of some particular colour, and we are aware of the necessity of looking back along the pedigree of any animal we purchase, lest the progeny should "throw back" to some irregularity; and we find all this, and perhaps more, in the breeding of fowls of the true type. Therefore it behooves us to be careful as well as watchful.

It is the better plan to keep no chickens for stock which were hatched later than May, except in the case of some particularly favourite and valuable strain. We now have Dorking pullets of this year which have already laid many eggs. Perhaps these came to life too soon, inasmuch as they may moult and prove unproductive at a season when eggs are scarce, which is, when the hens undergo the trying ordeal of putting on their winter's colours.

April-hatched pullets, however, are desirable. Late chickens seldom pay for the food and attention they require, when kept in large numbers. Now is the time to obtain

"wasters" cheaply for crossing purposes, when they answer as well as the most perfect fowls that money can purchase.—W. J. P.

#### Barn Yard Manure.

In the system of agriculture practiced in the United States barn-yard manure, from its cheapness and efficiency, must for a long time constitute the staple fertilizer under ordinary conditions of practice.

Dr. J. B. Lawes, in his valuable pamphlet on "Fertility," says:

"In the district where I live, the land is cultivated on a five-course shift, and the crops which are grown and sold off the land would cost more to produce by the means of purchased artificial manures than the sum which the tenant, under the above system of cultivation, pays for them in rent; or, in other words, as far as regards the production of the crop, the landowner sells his fertility cheaper than the manufacturer of manure could supply it."

The principle that underlies this statement, startling as it may appear, applies with twofold force to successful farm practice in this country.

On the average American farm, with its cheaper land, and soils that have been under cultivation for a comparatively short time, the natural stores of fertility that have been accumulated in past ages must be the leading element in determining the profits of grain production at low prices; and when this natural source of profitable cultivation is properly reinforced with the barn-yard manure that can readily be made, under a fairly good system of management, to retard and diminish the exhaustion that is unavoidable in a paying system of husbandry, the commercial fertilizers, which are too often urged upon farmers as the essential basis of good farming, will find their true place as supplemental manures that are desirable for special purposes.

Aside from the fact that barn yard manure is a complete fertilizer, supplying, as it does, the potash, phosphoric acid, and nitrogen, which are considered the only valuable constituents of purchased manures, it seems to have a specific action on the soil that cannot be obtained with any combination of chemical fertilizers.

In the Rothamsted experiments with drainage waters, from the plots which had been under continuous cultivation with the same crop for more than thirty years, it was observed that "whilst the pipe drains from every one of the other plots in the experimental wheat field run freely, perhaps four or five times or more annually, the drain from the dunged plot seldom runs at all more than once a year, and in some seasons not at all."

Dr. Voelcker remarks that "this result is interesting and important, for it illustrates in a striking manner the beneficial effects of barn yard manure on the soil in ameliorating its texture, and, generally speaking, its mechanical or physical condition, in consequence of which the growing crops will suffer less during seasons of drought."

After a careful investigation as to the causes of the small discharge of water by the drain of the dunged plot, Dr. Lawes and Gilbert concluded that "the result was due to the greater power of absorption and retention of moisture by the changed soil near the surface."

The power of retaining a large amount of moisture, in an available form, and without making the soil wet, seems, therefore, to be increased by the application of barn-yard manure, and this, with the increased porosity which renders the water of the lower strata of soil available for plant growth, explains the greater immunity of manured land from the effects of excessively dry or wet seasons.

The advantages of the barn-yard manure, under the unfavorable conditions of a wet, backward spring, followed by a severe drought, were decidedly marked in the crop of 1881 throughout the entire season.

From the first appearance of the plants above the surface to the time of harvest, the barn-yard manure plots could be clearly distinguished, even at a distance, by the vigorous and rapid growth of the crop, and when the tassels and ears were forming, the stalks were not only much larger, but they gave indications of a mature development that was not observed on the other plots.—MANLY MILES,

Houghton Farm.

## INSECT ENEMIES.

### THE CUT WORMS.

Shall now engage our attention.

The various species of Cut Worms are exceedingly troublesome in the early part of the season, doing much damage amongst young cabbages, Indian corn, and other plants. As they travel at night, and lie buried at the roots of plants during the day their presence can only be detected by the mischief they do. They are the caterpillars of certain night-flying moths belonging to the families Agrotididæ and Hadenadæ.

Last Spring a neighbour took me into his patch of corn to show me how the worms had thinned it out. Here and there, a wilting plant showed where the creatures were still at work. A little digging with a pointed stick soon brought the intruders to light. They proved to be the larvæ of *Hadenada Amica*. Besides the larvæ of this species, those of

*Agrotis tessellata*.

*Agrotis telifera*.

*Agrotis clandestina*

are commonly met with. *H. amica* cuts off the maize just below the surface of the earth. *A. tessellata* and *A. telifera* cut it off just above the surface. *A. clandestina* drags the plants into the earth to devour them. The habits of these larvæ in other respects are much the same; but the creatures differ from one another in appearance.

The most destructive cut-worm of the cabbage is the caterpillar of *Agrotis devastator*. It is green and lightly spotted and has a glassy appearance. Its head is red, and the first segment of the body, dark brown. It has a few scattered hairs.

There are other cut worms which I need not mention.

It is found that insects of these kinds in their larva state are unable or unwilling to climb a bank of earth. A good preventative, then, to their advance from neighbouring fields is to keep a furrow open around the corn or cabbage patch.

Corn should be planted "in the hill"; and, as soon as possible, the earth should be drawn up around the young plants both of corn and cabbage.

As the cut worms travel at night on the surface, and do not burrow from place to place, a ring of salt around the plant will effectually bar their approach.

Wood ashes, scattered in moderation, are useful both as fertilizers and protectors.

Digging at the root of affected plants is the only way of capturing the worm.

We will now consider

### THE ENEMIES OF THE WHEAT-CROP.

The most formidable enemies of the wheat crop are—

The Midge (*Cecidomyia tritici*)

The Hessian Fly (*Cecidomyia destructor*)

The Chinch Bug (*Macropus leucopterus*)

The Wire-worm (*Agriotes seneceus*).

The *Cecidomyiæ* are small gnats belonging to the order

DIPTERA (*Two-winged Flies*).

The maggots of *C. tritici* find their way to the milky kernels of the wheat, and impoverish the grain by suction.

Those of *C. destructor* carry on their operations just below the surface of the ground, fastening on to the stalks above the joint, where, protected by the blade, they draw the nourishment from the plant.

The *Chinch bug* is truly a bug, belonging to the HEMIPTERA or *Half-winged Insects*. It may be known by its white wing-covers. It has a black body relieved with reddish yellow and grey. It feeds in all its stages, not only on the wheat, but on a great variety of other plants. Like other bugs it lives by suction, and has an unpleasant smell.

It has not yet given trouble in Lower Canada.

The *Wire-worm* is the larva of one of the *Elateridæ* or *Skip-jack Beetles*. It feeds upon the roots of the grasses and the various kinds of grain.

To prevent, or keep under, all these plagues, I should recommend,—Fall ploughing as late as possible; thorough working of the land; thorough manuring; the use of phosphates; the growth of Spring wheat of hardy kinds; early sowing, and the protection of small birds.

By these measures the creatures will be exposed to the assaults of their natural foes, starved out, or crushed.

Poor grass land (in which wire-worms usually abound) should be yarded (1) before it is broken up.

Seed corn that is to be planted where wire-worms are likely to be met with should first have a little soft-soap stirred well into it—say, a tea-spoonful, into two quarts, and then be dusted with ashes. The worms will not molest the seed thus prepared.

### THE ARMY WORM

is sometimes destructive to wheat as well as to other crops.

It is the caterpillar of one of the NOCTUÆ, *Leucania unipuncta*. The eggs of this species hatch in May. The caterpillar when full grown is about 1½ in. long, and as thick as a goose quill. It is grey with yellowish lines. Its head is yellow marbled with brown.

The chrysalis in its proper season may be found in the earth

It is mahogany coloured, and has a short spine at one end.

The moth is a very uninteresting looking object, drab, or russet, in colour, having a milk-white dot near the centre of the fore wing.

A roller passed over the meadows or young grain will "flatten out" the worms to good effect; and, where the roller cannot be used, a trench round the growing crop will entrap them, as in the case of the cut-worms.

### THE TURNIP FLEA.

The Turnip Flea (*Haltica striolata*) is a minute beetle.

It is black with a buff stripe on each wing cover. It is beautifully formed, highly polished, and very lively. It hibernates in the imago state, and comes forth early in Spring to lay its eggs, and to enjoy itself at the farmer's expense. Lime-water has been used successfully against its English congener. To disappoint the "flea," sow late.

As most farmers in this part of the country think an orchard to be a valuable adjunct to the farm, I will say a few words upon

### THE CODLING MOTH.

The Codling or Apple Moth (*Carpocapsa pomonella*) belong to the Tortrix tribe. It is glossy brown, crossed by scalloped grey lines which give it the appearance of watered silk. At the hind angle of each fore wing is a large oval spot with a copper-coloured edge. It lays its eggs in the eye of the apple while the fruit is on the tree. The young grub

(1) What "yarded" means, I cannot tell; but perhaps it may be translated into English by the word "folded."

burrows towards the core. It is white, or flesh-coloured, and has a black, or brown, head. Increasing in size, it gnaws a hole to the side of the apple through which it ejects its "frass," so, making room for itself. The damaged apple falls to the ground before its time; and many thousands of bushels of the fruit are lost to the market in this way yearly.

The way to capture the insects is to bandage the trees with old cloths. The caterpillars on leaving the fruit will spin their cocoons, and, so doing, may be easily secured and destroyed.

Through waving groves where Silo's torrent flows,  
And where, Alborno, thy green ilex grows,  
Myriads of insects flutter in the gloom,  
(Æstrus in Greece, Asilus named at Rome,)—  
Fierce and of cruel hum. By the dire sound,  
Driven from the woods and shady glens around,  
The universal herds in terror fly;  
Their lowings shake the woods and shake the sky,  
And Negro's arid shore (1).

See Kirby & Spence's *Entomology*, page 82.

Est lucos Silari circa ilicibusque virentem  
Purimus Alburnum volitans—cui nomen asilo  
Romanum est, œstrum Graii vertere vocantes—  
Asper, acerba sonans; quo tota exterrita silvis  
Diffugiunt armenta; furit mugitibus æther  
Concussus silvæque et sicci ripa Tanagri,

Virgil. *Geor.*: III, 146.

We will now consider the insects which affect the farmer through his stock. And first we will speak of

#### THE BOT FLIES.

The Bot-fly of the Horse (*Gasterophilus equi*)

The Bot-fly of the Ox (*Æstrus bovis*)

The Bot-fly of the Sheep (*Cephalomyia ovis*).

Who does not know the Bot-fly of the horse? Who has not admired the perseverance with which the creature accompanies the horse for miles, hovering around its chest and fore legs, or the skill with which it darts in, at a favourable moment, protrudes its ovipositor, and glues an egg to a hair of the animal? Meanwhile the horse has shown by its uneasiness that it mistrusted the operations of its familiar.

The eggs deposited by the Bot-fly are ready to hatch in 4 or 5 days. The horse at this time licking itself, the wet tongue comes in contact with the eggs. They burst; and the active maggots adhere to the tongue, and are then taken with the saliva into the stomach of the animal. Here they fasten themselves by means of hooks, two in number and situated at the head. The maggots are nourished by the juices of the stomach. When full grown they are voided, and drop to the ground. There, they bury themselves. They then pass into the pupa state; and, in about 6 or 7 weeks the new bot-flies appear.

To prevent mischief from *G. Equi* let the horse wear a net, groom thoroughly, and make frequent use of the sponge and warm water.

Professor Pratt gives the following remedy for Bots.—

"Take oil of turpentine 8 oz., alcohol 1 quart. Mix and bottle for use. Dose 4 to 5 oz. in the horse's feed, once a day for 8 days, will effectually remove every vestige of bots."

#### THE OX BOT-FLY

pursues a different course. She bores a hole with her horny and augur-like ovipositor through the skin of the back of the animal, and drops an egg therein. The process takes but a few moments; but the ox does not like it. The hole thus made remains, and enlarges as the maggot grows, al-

lowing the air to reach its respiratory organs. A tumor forms, and from this the creature is at length ejected to pass the after stages of its existence as in the case of *G. Equi*. Young and healthy animals are selected by *A. bovis* as hosts for its progeny.

#### THE SHEEP BOT-FLY

lays its eggs in the nostrils of the sheep. The maggots crawl into the head, and feed on the mucilage produced in the maxillary and frontal sinuses. When they are full grown the sheep blows them from its nose, and they fall to the earth, there to pass into the pupa condition.

Pine-tar rubbed on the noses of the sheep is a preventative to the operations of the insect.

A few words may be acceptable concerning.

**THE SHEEP-TICK (*Melophagus ovinus*).**

Though it is ranked with the DIPTERA, or *Two-Winged Flies*, the sheep-tick has no wings. Unlike other diptera, moreover, its abdomen has no segments—it is a membranous sack.

The sheep-tick is in many respects a very remarkable insect.

It produces an offspring almost as large as itself, and that, not in the egg, but, in the pupa. This pupa is soft and white at first; but its case soon turns brown and hardens. At the front of the pupa is a notch, marking the lid. This lid in due time opens, to let the perfect insect escape.

Thorough washing, close shearing, and the application of a strong decoction of tobacco are the approved measures against this intruder.

Insects which resemble the sheep-tick in their operations are:

#### THE PIGEON FLIES, BIRD FLIES, LICE, &c.

Domestic poultry are troubled with various species of the genera *Argus*, *Ornithomyia* and *Acarus*. These creatures not only fret the birds, but cause irritation and disgust to those who tend them. Poultry should be well-fed. Their houses should be plastered and frequently lime-washed, and plenty of ashes and sharp sand should be provided for the birds to roll in.

Amongst the insects injurious to stock must be mentioned.

**THE BEE MOTH (*Galleria cereana*).**

The bee-moths belong to that group of insects called *Pyralidina* and to the family *Galleridæ* in that group.

Insects allied to them were known to the earliest writers on the subject of bees. Aristotle and Virgil allude to them. The former says, that the moths and worms are expelled by the good bees; but that the combs of idle bees soon perish.

The latter numbers "the moth's dreadful progeny" among the enemies of the hive.

In England four different bee-moths are met with, belonging to as many different genera but all in the family *Galleridæ*. They are *Galleria cerella*, *Aphomia colonella*, *Melissoblyptes bipunctatus*, and *Achroia grisella*. The first and the last are found in the hives of the honey-bee, and the second in humble-bees' nests. The habits of the third are unknown; but the structure of the perfect insect tells what it is. Twenty years ago I had abundant opportunities for observing *Achroia grisella* through all its changes. My accounts of the insects were published by the London "*Zoologist*," and by the "*Entomological Intelligencer*."

Only one kind of bee-moth is on the list of North American Lepidoptera, published by the Smithsonian Institute, Washington; and it is the species that we meet with in Canada, viz., *Galleria cereana*. In Langstroth's book on bees this insect is misnamed *Tinea melonella*. It is true that Virgil uses the term *tinea* in speaking of the bee-moth, but since the days of Fabricius it has been applied to a genus to which the bee-moth does not belong.

(1) *Negro* is the modern name of the Tanager.

I can detect no difference between the English *cerella* and the American *cereana*. The honey-bee is not a native of America. It was introduced from Europe; and *cerella* or *cereana* was probably introduced with it.

The creature in its perfect state is a brownish moth, measuring when its wings are expanded about an inch across. In repose the wings hang down like the sides of a table. The fore-wings are longer than the under wings, and appear as if roughly squared off. The female has a beak-like formation on the head, and a remarkable ovipositor which works with a telescopic motion enabling it to deposit its egg in crevices, out of harm's way. There are two broods; the first of them appears in May, and the second in August. If you take your stand by the hive at the close of the day, you may see the female moths hovering with a bee-like motion near the entrance of the hive. Their object is to dart between the guards, and find their way to the interior. Notwithstanding their amazing agility, they do not always succeed in this. I have more than once seen *Achroia grisella* seized by the bees, and torn to pieces with the utmost fury; and I doubt not that *G. cereana* often meets with the same fate. When the door of the hive is passed, however, the chief danger is over; and the moth proceeds to lay its eggs in suitable places within the hive. It is wonderfully tenacious of life: Langstroth tells us that Mr. Tidd of Boston, Mass., cut a female in two, and the abdomen went on thrusting out its ovipositor, and depositing eggs, in the slits which Mr. Tidd made with his penknife in the board on which it lay.

The larvæ, as soon as they burst from the egg, begin to spin silken tubes or covered ways, sheltering themselves under their work, and pushing it forward, extending the covered galleries through the hive to the broodcomb, on which they thrive most. In appearance they are waxen grubs with horny heads.

They are slightly hairy; and I imagine that the hairs serve as feelers. At any rate, the creatures are extremely sensitive darting back into their galleries—or, if exposed, throwing themselves into the most violent contortions—at the slightest touch. What Réaumur says of the moths I may say also of the caterpillars. "They are the most nimble-footed creatures that I know."

The bee-moths delight in ill-constructed hives in which there are accumulations of old comb. Their presence in any number is a sure sign of weakness in the rightful inhabitants. A hive in which they have well established themselves has a very offensive smell.

To keep them under, the modern hives with moveable frames should be used. Affected comb should be cut away and destroyed. It should be remembered that masses of web and broken comb thrown on the refuse heap will afford both food and protection to any larvæ that may remain in them; and in due time perfect insects will come forth to invade the hives again.

#### THE GRAIN MOTH.

##### III.

We will lastly consider the insects which affect the farmer through his stores. "When goods increase they are increased that eat them, and what good is there to the owners thereof saving the beholding of them with their eyes." *Ecc. V. II.*

Solomon said this with reference to the human parasites and adherents of the rich; but it is true also as regards the insect world.

Among the insects that damage the farmer's stores are various species of *Tinea*.

#### TINEA GRANELLA.

This, in its perfect state, is a small moth which is about  $\frac{1}{3}$  of

an inch long. It has glossy fore-wings, marbled with grey and brown, and spotted. Its hind wings are dark. There are two broods in the year. The first appears in May and the second in August.

The caterpillars as soon as they are hatched begin to eat the grain, and to spin a web, mingling with it the rejected fragments of their food, and, as they increase in size, the grain itself. Where the creatures abound, the whole surface of the grain in the bin will be found tangled into a crust of webs and damaged grain.

The caterpillars that do the mischief are yellow or buff in colour, and have reddish heads. When full-grown, they are half an inch long. They creep into some nook or crevice to spin their cocoons, which are about the size of a kernel of wheat. The chrysalis is brown and shining.

To remedy, in a measure, the effects of the caterpillar, the grain should be passed through the fan. To prevent them, it should be kept in barrels or small tight bins, in cool and dry apartments.

There is another very small but very destructive grain-moth met with in the states.

#### THE ANGOUMOIS MOTH (*Butalis cerealella*)

The larva of this eats out the heart of corn and wheat, and becomes a chrysalid in the hollowed grain.

Kiln-drying and fumigation have been tried for the destruction of the creature. But "prevention is better than cure," and early threshed and safely stored grain is likely to escape the ravages of the insect.

#### THE CHEESE FLY (*Piophilæ casei*)

This is a very small fly only  $\frac{3}{20}$  of an inch in length. It is glossy black, and has transparent wings. Its hindmost and middle legs are yellowish.

The maggots are well known. Some epicures do not regard them as disadvantages; indeed they go so far as to consider the cheese improved by their presence. Perhaps if they saw the creatures through a microscope they might not relish the cheese so well. A good deal depends upon how we see things.

A philosopher thus viewing one;

"We turned the instrument up and down

Till getting a proper sight he

Exclaimed—as he gazed with a puzzled frown—

"Good gracious" and "Highly-tighty,"

"The sight is enough to alarm the town,

A mite is a monster mighty."

From t'other end, of the tube, the mite

Regarded our scientific,—

To his naked eye, as you'll guess, the sight

Of a man was most terrific,

But reversing the microscope, made him quite

The opposite of "magnific."

"One sees the truth through this tube so tall,"

Said the mite as he squinted through it,

"Man is not so wondrously big, after all,

If the mite-world only knew it."

#### MEMORANDUM.

Whether a thing is large or small

Depends on the way you view it."

—*Fun in Science and Practice Vol. II. No. II.*

#### THE MEAL MOTH (*Pyralis farinalis*)

#### THE CLOTHES' MOTH (*Tinea vestianella*)

THE FUR MOTH (*Tinea pellionella*) and some others, are more or less mischievous; but their intrusions are upon the domestic department; and remedies against them are known to every careful housewife.



Although the depredations of the insect tribes occasion loss to the agriculturist, and often sorely try his patience, we must not conclude that those tribes are productive only of ill. On the contrary, they serve many useful purposes, in the wisely ordered and beneficent system of nature. Some check the overgrowth of particular plants, that less luxuriant ones may have a chance for existence. Others serve as scavengers, preventing the corruption that could otherwise ensue. Many furnish food to creatures which in turn become food for man. If their pursuits at any time seem to run counter to man's interests, they, even then, call into exercise qualities with

which he, as the lord of creation, is endowed; and it is good for him to have those qualities furnished by the exigencies of life. Nor must it be forgotten that destructive insects are agents of Him who has decreed that "man shall eat bread in the sweat of his brow." It is well for a community, when only the ordinary proceedings of these creatures have to be met or endured. There is indeed tribulation and anguish when the Lord in righteous indignation sends forth the locust, the caterpillar, and the palmer-worm, his great army to make a fruitful land barren, "for the wickedness of them that dwell therein."

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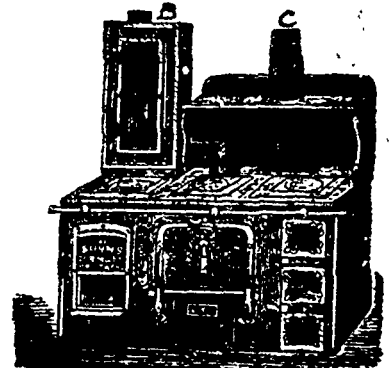
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