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CANADIAN AGRICULTURIST.

"The profit of the earth is for all; the King himself is served by the field."—Eccles. v. 9.

GEORGE BUCKLAND, } EDITOR,
WILLIAM McDOUGALL, } ASSISTANT EDITOR.

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PROFESSORSHIP OF AGRICULTURE IN THE UNIVERSITY OF TORONTO.

Farmers of Canada; you who have subdued the forest and by your indomitable industry dotted over the country with comfortable homesteads and thriving settlements; you who are the main source of our wealth and prosperity, will soon, we are happy to hear, be directly represented in the highest Educational Institution in this Province. As intimated in our last, the authorities of the University are contemplating a plan for filling the chair of Agriculture, and converting a portion of the University grounds into an *Experimental Farm;* and by what fell from the Chancellor, at the meeting of Convocation the other day, we are led to expect, that these valuable objects will be speedily carried into effect. The press, as was to be expected, has favourably noticed the movement and we should hope, for the character and good of the country, that no factious opposition would be offered to its progress and successful termination. We are not in possession of the full particulars of the scheme which is now before the Senate; but we understand that it is proposed to place the whole of the University grounds, consisting of about 180 acres, under the superintendence of the Professor of Agriculture; whose duties are not to be confined to the delivery of class lectures on mere scientific, or even practical subjects, connected with husbandry and rural affairs;

but a sufficient portion of those grounds that are already cleared of timber, comprising some 70 or 80 acres are to be devoted to the purposes of experimental and practical farming. The land is to be given up for a term of years free of charge to the Professor, subject to the control of the Board of Agriculture;—an important, and what it is hoped will prove, a most useful instrumentality, that is about being organised under the provisions of an act of the Legislature, passed last session. We learn upon good authority that the Government will recommend to Parliament a sufficient grant of money for carrying out the important objects of the Board, and for sustaining with increased vigor the Provincial Association. The country should distinctly understand that this is no mere political movement for party purposes; its object is purely patriotic, and it should enlist the sympathies and support of all who sincerely desire their country's welfare. We live in an age and are now placed in circumstances, which imperatively demand, that the improvement of agriculture, the main source of our wealth, should receive the earnest attention and support of the Legislature, irrespective of what party may control the helm. Many other countries, our near and enterprising neighbors in particular are prosecuting this object with an earnestness and intelligence that cannot fail of success; and amidst the increasing competition of the civilized world with the markets of the mother country equally thrown open to all, it will not do for Canadians to fold their arms in listlessness, and to stand still, while the rest of the world is rapidly moving onwards. Not a moment ought to be lost. We must be up and doing; bringing willingly to our aid whatever science or experience can suggest for increasing the fertility of our fields, and for developing those great natural sources of wealth and enjoyment, which a bountiful Providence has placed within our reach.

The recognition of the claims of agriculture by the University, cannot fail to render that important Institution more popular and useful, in a country where four-fifths of its inhabitants are engaged in the cultivation of the soil. The social *status* of our farmers will become elevated, by associating the Science and practice of their pursuits, with a liberal course of academical learning; while existing systems of farm practice, will be necessarily improved, by imparting to the young, sound, practical knowledge, and the results of carefully conducted experiments. We will now proceed to give our views of this matter a little more in detail.

In the first place, whatever is attempted should bear upon the face of it, the stamp of *practical utility*. The lectures of the Professor on the theory and practice of his art, ought to be fully illustrated, not only by diagrams, specimens and models, but especially by frequent reference to the daily operations of the farm. The merely pointing out the application of some of the laws and doctrines of chemistry, geology, animal and vegetable physiology, &c., to the pursuits of the farmer, however interesting and suggestive as many of these undoubtedly are, would be quite a different thing from the practical teaching of agriculture as an *art*. The principle on which a Professorship of agriculture should be founded in the present day, according to our notion, is that of *Practice with Science*.

This leads us to remark upon the advantages of an experimental farm, which without the most careful and elaborate teaching in the class room would loose the greater portion of its practical value. By an experimental farm, however, we do not mean what is commonly understood, a *model* farm; two things that are very distinct but frequently confounded. The first is chiefly designed for testing the adaptation of new kinds of agricultural productions to certain conditions of soil and climate; a number of experiments are being conducted at the same time, and every thing of moment relating to them is carefully observed and recorded. Such investigations are in themselves extremely interesting, and open up broad views of the nature and relations of agriculture, both as a science and an art; and should only one experiment in a hundred, or even a thousand be successful, that is, be the means of introducing into general culture, some fresh production or improved variety, suitable to our soil and climate and the demands of the market, the benefit to the country might become positively immense. Besides, in experimenting there is frequently as much to be learnt from failure as success; fresh light is often thrown upon matters, which were before obscure; anomalies become reconciled, and the path of investigation, leading to future discoveries, is rendered more direct and easy.

How different is it with a *model* farm, or in other words, a farm consisting of a specific soil, in a certain relative situation as to climate, markets, the price of labor &c., and managed, in all its departments, solely with a view to the maximum of money profit. Such a farm might well be considered a model, that might be safely followed by all farmers, who happened to be placed under *similar conditions*. But it must be plain at once, to the most ordinary reflection, that in an extensive country like Canada, possess-

ing great diversities of soil and climate;—some sections of which having already an exhausted soil, while others have scarcely yet been turned over by the plough; with great inequalities as to markets and the pecuniary means of farmers; that what might very properly and safely be regarded as a model farm, in one township or county, might be altogether inapplicable to the situation and exigencies of another.

"*Model farms*, (observes Mr. Stephens) have been recommended to be established with a view to promote the teaching of practical agriculture. I do not comprehend what such a model farm is—for a farm which is laboured by pupils can show a model of farming to no one; and any farming practised by a body of men having the management of a school, will be greatly eclipsed by that of many a single farmer, and it, therefore, in justice to farmers, cannot be recommended as a model. Schools established for teaching agriculture, should have attached to them what may be termed *instructive*, not *model* farms. * * * * Were a pupil, trained on an ordinary farm, to have opportunities of witnessing varieties of experiments on an *Experimental* one, he might benefit by the numerous hints and suggestions he would receive; and, on the other hand, were an Experimental farm wrought only by inexperienced pupils it would be injured. So far from *pupils* being able to conduct experiments, the most experienced cultivators are baffled by unforeseen difficulties, and were it known that the experiments on such a farm were conducted by pupils, their results would inspire no confidence in farmers."

An Experimental farm, such as would benefit the country and afford the means of instruction to pupils, could not in itself be made a profitable concern. We would therefore suggest that it should be commenced on a small scale; fifty acres for *mere experimental purposes* would be sufficient for a beginning. The University grounds contain, we understand, about 180 acres; the greater portion of which consists of park and shrubbery. We would strongly urge that the ornamental portions be held sacred, that no vile brick and mortar should be permitted to mar those beautiful avenues, which ought to be the pride, as all strangers pronounce them to be the ornament of Toronto. If the park were improved by being levelled and drained; the young trees thinned and tastefully set out in groups, and the whole seeded down with nutritious grasses, it would yield a considerable money return for pasturage; and the University might boast of possessing grounds, which for extent and beauty, would be unsurpassed, if not wholly unapproached by any similar institution on the continent of America. Nor in our opinion would the picturesque effect of the scene, as a whole, be at all lessened, by devoting some fifty or sixty acres which are already free from trees, to objects more in accordance with the utilitarian spirit of the age.

We like the idea of placing the Experimental Farm under the management of the Professor, in connection with the Board of Agriculture, which will be a popular and responsible body, chosen by the Directors of the County Societies; and which will also have the management of the Provincial Association. Beside an annual importation of grain, grass seeds, &c., from abroad, for the purpose of testing their suitability to this country, it would be desirable to procure, in small quantities, most of those substances which an advanced husbandry employs as manures, if it were only to afford pupils an opportunity of witnessing their effects and mode of action.

An agricultural museum would form a very desirable appendage to an illustrative farm; comprising a collection of improved implements and machines; roots and plants, both wild and cultivated,—thus illustrating the geology and botany of the country. Prize specimens of grain, &c., would also be suitable for such a purpose. A museum of this kind might be formed gradually without incurring any very serious expense. Implements, &c., might doubtless be obtained of the different manufacturers, both in Canada and the States, for the purpose of exhibition; many of which would find a ready sale. Their merits should, as far as possible, be practically tested on the farm, that farmers might have the benefit of the knowledge thus acquired, before they purchased. An agricultural Library would be a valuable auxiliary, and this likewise might be collected by degrees, without a great pecuniary outlay. Donations of books from various quarters would no doubt be received; and as the Board annually make their Report, to Parliament, a report embodying all that is interesting in relation to the various Agricultural Societies in the Province and the Experimental Farm,—it should be sent as soon as published to the principal Agricultural Associations, both in Europe and America, in exchange for their respective journals.

Upon the whole, then, we consider this to be an important move in the right direction; and that it will meet with the hearty approval of the intelligence and right feeling of the country. Without efforts to develop the productiveness of the soil, and to attract to our shores, settlers having both means and industry, it will be mere folly to attempt the construction of either railways or ca-

nals; which, without a flourishing agriculture, would be left without business, and consequently without profits.

We cannot do better than close these observations in the words of Professor Norton, of Yale College, a name with which most of our readers are already familiar.—[*The Farmer's Guide, Editor's notes, page* 2.]

"An attendance of two or three months in each year upon courses of lectures, relative to scientific agriculture, would expand and cultivate the mind, would open new sources of interest, and enable him to reason upon the various processes which he had observed during the summer. This would not injure him as a practical man; on the contrary, it would tend directly to his success. Labor during the usual season of occupation in the open air would invigorate the frame, as a winter's study would strengthen the mind.

"Farmers may write and talk about the elevation of their class for centuries to come, as they have done in years that are past: but they may rely upon it, that education is the only true road to that which they desire. Until they are ready to provide the means of regular instruction in the art of agriculture for their sons, mental instruction as well as physical, they will always be compelled, as heretofore, to submit to the lead of lawyers, manufacturers, literary men, and members of other professions, in which a special education is considered absolutely necessary to distinguished success.

"An institution which should unite practical with scientific teaching, if properly organized, would be the best of all preparatory schools; for there the union of instruction with actual work would be complete. Such establishments have hitherto, for the most part, been mere manual labor schools, with only the name of science. We may hope that a better day is coming; that we shall soon see institutions capable of imparting every description of knowledge that is to be desired by the practical man, and in addition to this so organized, that by means of extensive researches, conducted by men of undoubted ability, they may at the same time advance the range of our knowledge, and command the respect of every class in the community."

Two Lectures on Agricultural Chemistry;

By Henry Youle Hind, Mathematical Master, and Lecturer, in Chemistry and Natural Philosophy, at the Normal School for Upper Canada. Toronto: Hugh Scobie, King Street, 1850. Price 1s. 3d.

This little work, we are informed in the preface, contains the substance of lectures on Agricultural Chemistry, delivered by the author during the past summer at preliminary meetings for the formation of Teachers' Institutes, in various County Towns of Upper Canada; and he now presents it to the Farmers and Schoolmasters of this country, "with a hope that it may assist in calling forth a spirit of judicious enquiry, among the many intelligent and enterprising members of those numerous communities."

The author's style is smooth and perspicuous, and he has been successful in condensing a considerable amount of scientific information that is both interesting and useful to the practical farmer. The work without making any pretension of being an introductory, or systematic treatise, may be read with profit by persons having no previous acquaintance with Chemistry; the leading principles and doctrines of that beautiful and comprehensive science are expounded in a popular manner, and their applications pointed out to the cultivation of the soil, the raising of plants, and the management of animals. There can be no doubt that chemistry is silently influencing and improving the practice of the enquiring agriculturist; but the sanguine expectations held out by amateur farmers, political economists and some scientific men, a few years since have, as yet, fallen far short of realization. Although it may be difficult to trace any great agricultural improvement directly to the suggestions or teachings of science, strictly so called; yet it admits not of denial that both the theory and practice of agriculture have of late years been greatly improved; and that the researches of the chemist have proved higly suggestive and beneficial to the farmer, particularly in reference to the composition and application of manures.

We feel much satisfaction in recommending to the notice of our readers Mr. Hind's Lectures, and quote for their perusal a few of the concluding paragraphs.

Let us in concluding, take a cursory view of the several conditions of vegetable life and health, which unite with the operations of husbandry in establishing the results of which the Agriculturist is in quest. He can exercise no control whatever over the air plants and animals breathe; and yet many of the most terrible visitations he fears are dependent upon the condition of air. Upon its state, rests the appearance of Rust, Mildew and

many parasitical insects, all of which lead most effectually to destroy the anticipated results of his industry. The condition of perfect humidity in a warm atmosphere, at certain seasons of the year, will suffice to cause his crops to be clothed with the most destructive of microscopic plants. This humid state may occur in March, April, September, &c., without being the cause of prejudicial results, if it happen in May or June great danger is to be apprehended. From observation, we learn, that luxuriant wheat grown on rich moist soils is very liable to be struck with Rust or Mildew. This is often the case on fertile river bottoms—on the rich bottoms of the Thames &c. It is also remarked that in late seasons Rust is most destructive; that the time when it strikes the plant is generally in the month of June—if late in that month, the straw only suffers, if early, straw and grain are both lost. Now, as the humidity of the atmosphere is beyond the control of man, he must adapt his labours to the circumstances of the climate. He must endeavour to have an early crop—with a thin, strong, flinty stem. It has been before remarked, that the means for ensuring the ripening of wheat, from two to three weeks earlier than the average period, are to be found in draining and liming, both operations, besides ensuring early maturity, improve the sample and strengthen the straw.

The agriculturist is dependent upon other meteorological phenomena, with the due occurrence of which, the health of his crops is most intimately associated; upon rain and temperature. He has occasionally to deplore the occurrence of dry weather in the spring, and of wet weather in the harvest time. The seasons of the present year were particularly distinguished by these drawbacks. Those artifices which are commenced by experience and suggested by the science of agriculture, present him with the only means capable of lessening the amount of evil flowing from such casualties. On drained soils, the roots of cultivated crops descend deep, and find in dry weather a supply of moisture. Their early maturity saves them from that destruction which is always more or less to be lamented in wet harvests. In backward and wet seasons, the grain crops lose many days of warm spring weather on undrained soils, before they commence growing. The heat of the sun must first drive off the superfluous water, which is lodged in every hollow and depression, although it may not be visible at a superficial view. Cold rains invariably check the growth of vegetables, and a cold watery bottom (pan) to the soil in which the roots repose, can never be expected to favor the growth of a healthy plant. The appearance of yellow leaves upon wheat in the spring, is the result of disease, and may be produced by excess of moisture or by excess of drought. It has been already shown, under the head of draining, that that operation greatly increases the temperature of the soil, by allowing warm air to circulate through its pores. Vegetables do not necessarily thrive when the surface of the soil is exposed to a great increase of temperature; it is when heat descends to the roots that they feel its invigorating influence. The warm sun of April and May cannot produce the same effects in vegetable mould, as upon one of a light, sandy, porous character.

We have seen that uncultivated vegetables derive a very large portion of their substance from the admixtures of air, carbonic acid and ammonia. Cultivated crops obtain these elements of *food*, not only from air and decaying vegetable matter, but also from manures. That department of husbandry which involves the *production, preservation* and application of manure, necessarily calls for the careful attention of the agriculturist. Chemistry and experience both set *their mark upon* farm-yard manure, as constituting the most useful means of improving the fertility of the soil: and *of farm-yard manure, the liquid portion*, the urine of animals, is unquestionably the most valuable. The solution of mineral ingredients in water, previously to their entrance into the roots and system of vegetables, directs particular observation of the soils, and the properties possessed by their component parts. It appears that the same kind of vegetable growing for a succession of years upon the same soil, abstracts certain soluble mineral ingredients, faster than the great agents, heat, air and moisture, can create a supply from the vast store which exists in an insoluble state in the soil. Hence the vegetable cultivated under such circumstances, becomes deteriorated in quality, and approaches nearer and nearer to that primitive, wild state, in which its kind existed before cultivation produced the wondrous development of its organs which fit it for the food of man. (Witness the wild potato, the plum, wild rice, wild wheat, wild oats, &c.) To avoid this deterioration, experience and agricultural chemistry point to rotation of crops, fallowing under certain circumstances, farm-yard manure, mineral manures, as lime, wood-ashes, gypsum, &c.

The growth of weeds among cultivated crops, is an increasing and serious evil. *Nourishment* which, in their absence, would find its way into farming produce, feeds them into a luxuriant and fruitful habit, which at once suppresses the growth diminishes the yield, and impairs the sample of those vegetables for whose benefit all the artifices of husbandry are expressly practiced. The use of clean seed, the practice of clean cultivation, of draining, and of rotation of crops, can alone eradicate those hurtful vegetables, which, from past neglect, seem now to be successfully struggling to gain exclusive possession of many fertile tracts of country.

The cold of winter is sometimes so severe, that the wheat plant loses its vitality, even on drained soils. This happens when there is a deficiency of snow. A covering of snow prevents radiation of heat from the earth into the clear expanse above. The temperature of two plants, one exposed to air on a fine clear cold night, the other covered with a very loose coating of straw, differs by many degrees. A few loads of long dung or litter strewd over the wheat in the month of December, will retard radiation, and prevent the temperature of wheat plants from sinking so low

during severe winter nights, as to endanger their vitality. Lastly, the economy of a farm cannot in general be preserved without a due proportion of stock for the production of manure, and the preservation of a judicious rotation of crops."

VILLAGE LECTURES.—No. 1.

We insert from the London Agricultural Gazette, the following and succeeding lectures on Scientific and Practical Agriculture, which, from the simplicity of the language in which they are expressed, and their general utility to the farmer, we trust will be acceptable to a large proportion of our readers:—

The Soil and the Air.—The soil and the air, in connection with agriculture, have no immediate bearing upon their daily pursuits; and whether the influences which thus affect the practice of the farmers be capable of satisfactory explanation or not, the practice and profit of their own individual occupations will remain precisely as they hitherto have been—undisturbed by those particularlar truths which our subject includes. This subject, however, I am persuaded is not the less appropriate on that account for general consideration. It is one of general interest. not only because the air we all breathe and the soil we all tread cannot, but in some measure, affect us all alike, but because the usefulness of knowledge of this, as on every other subject, is not measurable by the pounds-shillings-and pence scale, which would confine it to those cases exclusively where a money result depends upon the possession of it. There is a usefulness besides that which immediate profit measures; and though the agriculturist should not, and others could not, earn the more because they know the more of the air and the soil in connection with the art of cultivation, yet such knowledge is beneficial to all as addition to mental if not to material wealth—as food for the mind, which, like the body, can live only by appropriate nourishment—as matter for pleasurable thought, from which, as from all other topics, we may usefully draw the unfailing inference regarding the wisdom, skill and power, and goodness which creation everywhere exhibits.

But if the soil and the air, in connection with agriculture, may reasonably claim the attention of all, it seems to force itself upon that of the farmer, and it is in that aspect of the subject, almost exclusively, in which it appears to him, that I have now to ask your attention. It certainly must have sometimes occurred to those who cultivate the ground and superintend the growth of crops, to ask where these crops all come from. Do you think that they come out of the land—from the soil on which they grow? Let us just consider this question in detail. Take the case of a forest of trees. Did all that wood come out of the soil? Suppose a man to plant an acorn in a piece of clay land and watch its growth. He sees the shoot and the young tree increasing in size, and if he should live long enough, he would ultimately see the old tree with its trunk, its branches, and its twigs, containing perhaps 40 or 50 tons' weight of wood—a result of the life which was resident in that little acorn. Where did it get that wood? The roots of the oak grow downwards in the earth to a great depth—do they find its woody matter there? They also spread on the surface to some extent, but do you think that there is enough of the woody charcoally matter to furnish the material of that great tree? It was a poor clay when the acorn was planted, and no one has been near the place since to supply the growing plant with the matter it wanted. We may suppose the tree to have stood in a forest near which no dung cart ever went, so that no supply of food for the plant could have reached it beyond what existed when the seed was planted, and then the soil was very poor, and contained none of the material which has since appeared in the stem and leaves, and branches of that great tree. How did they obtain it? The thing certainly appears difficult of explanation.

Take the case, too, of any of our common crops—of our grass lands, for instance. Let us imagine the case of a dairy farm of 100 acres; we may suppose it to be able to maintain a herd of 30 cows. What will such a farm produce in a year? Suppose it to be good land, able to keep a stock of good sort. Perhaps I shall not be far wrong if I put the produce of a cow at something like 3¼ cwt. of cheese, and 30 or 40 lbs. of whey butter every year; and besides this there may be some bacon made from the waste of the dairy. Well, then, a farm of 30 dairy cows will yield nearly five tons of cheese, and eight cwt. of butter in the year, besides this bacon. That quantity of butter and cheese are exported annually from that extent of grass land. Now, where did that butter and cheese come from? Have they been made out of the substance of the cows? They are as heavy now as they were. It has not been made at the expense of the cows—any more, indeed, than the wheat or the barley, which comes from the threshing machine, is made, at the expense of the machine. The cows are merely the machines by which the cheese is made out of the food they eat, and just as the wheat is in the rick that is being threshed, so the cheese resides in the grass that is being

eaten. Well, then, where does the grass get it? From the soil, do you think? Just consider; take a hundred years—what has been added to the soil of that farm during that period? Hardly anything; the farmer may perhaps have bought some bran and some meal every season for the pigs; but then he has sold the bacon made by his purchases, so that the farm has lost as much as it has gained, in that respect. He has bought no manure. It will not do to say the farm continues to yield the grass because of the manure that is added, for none has been added to farm. Manure, has, no doubt, been added to the field, but none has been imported from without the farm, and yet, five tons of cheese have been exported every year; and how has that great draught upon the farm been maintained without loss? The manure that is applied to the field helps the grass greatly; but it cannot supply the cheese I speak of; for you must acknowledge that the manure is just what remains of the grass after the cows have taken the butter and cheese out of it, so that every year, the land is robbed of so much cheese; that is, if the cheese be in the soil. But can you believe that it is? Can you believe that every year, the soil of this farm is the poorer by five tons of cheese than it was? Why, how long had it stood this waste? If we suppose that it has been yielding at that rate during 1,000 years, there must have been 5,000 tons of cheese in the soil of that farm—50 tons of cheese in every acre of it, at the beginning, and if anything, the farm is more fertile now than it was then—fuller of cheese, no doubt, than ever; so that for all we know, there must be thousands upon thousands of tons of cheese in it still. Ah! but that explanation cannot stand; we cannot believe that the wood of our trees, or the cheese, or the butter of our dairy farms comes out of the soil. Where do they come from then?

Now, before attempting to answer this question, let us take the case of an arable farm. Suppose we take our own, at —— for instance. It contains about 272 acres of land—off 120 or 130 acres of it, every year, we cut a crop of wheat, which may average from 32 to 36 bushels of wheat per acre; and besides these, 4,500 or 4,600 bushels of wheat, we sell annually, probably, ten or eleven tons' weight of beef, mutton, and bacon; that is, the animals we sell off, are, on the whole, heavier by that weight, than they were when brought on. We buy some 100 or 300 bags of meal and linseed as food for the live stock every year, so that much is added to the soil every year, and that may account for 500 or 600 bushels of wheat we sell off; but where do we get the 4,000, and where does all the beef and mutton that we sell, come from? It will not do to say that it comes from the manure; for set a watch upon the entrance gate of the farm, and count what goes in and what comes out of it in a year; hardly any manure goes in, and you will find that 4,000 bushels of grain go off the farm in a year, and you will find that ten or eleven ton's weight of meat go off the farm more than comes on it in the year. Where does all that food come from? The question is, whether or not it can be supposed to come from the soil.

During the past ten years, we must have sent off the farm 30,000 or 40,000 bushels of wheat, and 100 tons of meat. I take our own case as it is, the only one I am perfectly acquainted with; but any cultivator of the soil will, if he looks back a few years, have to acknowledge the same remarkable truths in the case of his own farm. Do you think that all that bread and beef came out of the land! Why, the land is richer and better after all that has been taken out of it than it was before; and if it be kept in cultivation for years to come, it may yield hundreds of thousands of bushels of wheat yet; they are not there now, most certainly,—where will they come from? Neither the wood of our trees, nor the dairy produce of our grass lands, nor the grain and meat of our arable lands can be supposed to come from the soil. If all the wheat, oats, rye, barley, beans, peas, bacon, butter, cheese, beef, mutton, and so on, that England has produced since it was first cultivated, were piled upon the land now, it would be more than a foot deep over the whole island. Deeper than the soil itself is, on the average, over the country. And should things remain as they are for another 1,000 years, the land will have yielded another such lot; that is, more food in point of bulk and of weight, than the soil itself actually is. Where has it, where will it all come from? That is the question. (The answer will appear in our next number.)

TRIAL OF SUB-SOIL PLOUGHS.

On last Tuesday, 12th inst., a trial was made of the comparative merits of a sub-soil Plough manufactured by the firm of Rapelje & Co., of Rochester, in the State of New York, and one of English manufacture, made by Read. The trial took place on the farm of J. B. Marks, Esq., near Barriefield, Read's Plough is the property of Charles Penner, Esq., of Lacnine, the one which was exhibited at the Provincial Show, held in this City in 1849, on which occasion the first prize was awarded to one of the Rochester made ploughs. Read's plough carries the palm in England, as making by far the best work of all

the sub-soil ploughs brought into competition with it there.

The undermentioned practical Agriculturists were present by invitation of Mr. Marks, to witness the trial, viz;—Charles Penner, Esq., Dr. Young, of the Garrison, W. Ferguson, Esq., W. Holdiich, Esq., A. Cameron, Esq., W. Wilson, Esq., Thomas Briggs, Esq. Mr. W. Starks, Mr. A. Laidlaw, Mr. James Cowan, and Mr. John Dunn, who unanimously decided in favor of Mr. Penner's Plough,as being lighter of draft, easier to hold, and more thoroughly breaking up the soil, without bringing too much towards the surface. It is to be hoped some of our plough manufacturers will embrace the present opportunity of making application to Mr. Penner for this plough, to take patterns by, and thereby supply their customers with the best articles as yet known of this most valuable farm implement. The day was highly favourable, and no pains were spared to do every justice to investigations. The approved Plough while cutting to the depth or six inches under the bottom of the previously cut furrow, was drawn by one horse, and that a light one, while the other plough was drawn by four yoke of oxen and one horse in front. The business of the day was closed at the hospitable board of Mr. Marks, who on this, as on every other occasion, evinced his zeal in the improvement of the agricultural affairs of this country.—*Argus.*

WHY IS THE GARDEN MORE FERTILE THAN THE FIELD?

The universal answer to this question, is, because it is more highly manured, and therefore has a *richer* soil. This is not always the case. But it is owing to the finely pulverised condition of the beds, that gives it a highly absorbient power to attract moisture from the atmosphere—a source of fertility that many farmers scarcely seem aware that they possess. If the soil of the field were as carefully worked, and fresh earth constantly exposed to the atmosphere, as in the well-tended garden, the land would increase, rather than deteriorate in fertility. Let the rule be, "plow deep, cultivate well, pulverise lumps and sods, and return the straw to the soil," and you may carry off an immense quantity of human food, and still have a fertile soil remaining.

Plants, in their nature, are organised beings. By means of their roots they take up food from the soil—and often, the very food which the soil has taken up by its power of absorption from the atmosphere, and which power is increased to an almost indefinite extent, by disintegrating the particles of which it is composed. The very act of plowing and harrowing, is an act of manuring. The act of stirring the earth, in times of drouth, serves as a watering of the plants. The moisture thus absorbed is loaded with a fertilising power that is lost upon a hard surface, for it lacks the power of absorption.

If, then, you would have your fields as fertile as a garden, you must not depend alone upon manure, but pulverise freely, not upon the surface alone, but deep below it.

WATER OXEN.

We notice the arrival from Constantinople, per bark New World, via Liverpool, of two pair of Asiatic buffalo calves, or as they are generally called in the books "water oxen."

These animals have been imported by Dr. Davis, for Mr. Williams Middleton, whom we understand, some time since adapted, (by wire fencing,) a large extent of land for the rearing of cattle, and in which he has about one thousand head, sustained entirely by the natural resources of the land, not only giving him a large revenue, but adding greatly to the supply of veal, butter and beef markets in our city.

A pair of these water oxen brought out by Dr. Davis over a year since, are really objects of curiosity, (and of course of corresponding promise,) from their remarkable fatness, and this from feeding on the marsh grass of the Doctor's farm. Mr. Middleton has, in his enclosure, a great deal of this marsh land, now valueless, which, we believe, he is now about to turn to good account with these animals.

The water oxen disregard mud or bogs, and are hence well adapted, as working oxen, in such lands. A great part of the day they spend in Ashley River and an artificial pond on the Doctor's farm, with only the nose out of water. They grow to an enormous size, the cows, tolerable milkers, and very fair as beef cattle.

We are thus particular in this notice, hoping that the planters on our extensive marshes and rivers, where the freshets are so destructive to cattle, will examine into the capabilities of these animals, and avail themselves of this facility of importation.—*Charleston Mercury.*

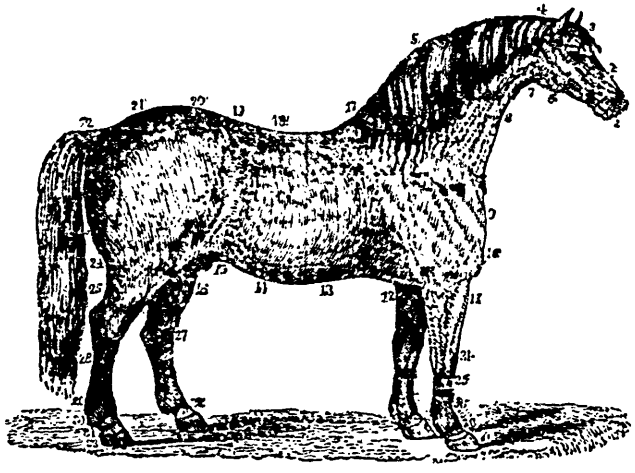
CERTAIN CURE FOR FOOTAIL IN SHEEP.

The following receipt was handed to me by Mr. Thomas Wilkinson of England. I tried it successfully myself, and feel confident in recommending it to others as an effectual cure for this troublesome disease.

Take of quicksilver, one ounce, aquafortis, (nitric acid) two ounces, and put them together in a glass bottle; place it in the sun, or in a warm place, with the cork out till dissolved, when it is ready for use; cut the hoof away, as far as diseased; dip a feather in the mixture, and be careful to annoint the diseased part all over. After this, keep the sheep in a dry place for eight or ten hours.—They seldom require more than one dressing if properly done. It will be necessary, also, to wet the feet of the sheep not diseased, with turpentine, to prevent it speading further amongst the flock.

HUGH EATON.

N. J., Sept., 1850.



TERMS DENOTING THE EXTERNAL PARTS OF THE HORSE.

1. Muzzle.
2. Face.
3. Forehead.
4. Poll.
5. Crest.
6. Jowl.
7. Gullet.
8. Windpipe.
9. Point of the Shoulders.
10. Breast or Bosom.
11. Arm.
12. Elbow.
13. Girth.
14. Flank.
15. Sheath.
16. Stifles.
17. Withers.
18. Back.
19. Loins.
20. Hip.
21. Croup.
22. Dock.
23. Quarter.
24. Thigh or Gaskin.
25. Hamstring.
26. Joint of the hock.
27. Ham or Hock.
28. Common.
29. Fetlock.
30. Large Pastern.
31. Small Pastern.
32. Coronet.
33. Hoof.
34. Knee.
35. Common.
36. Fetlock.
37. Heel.
38. Large Pastern.
39. Small Pastern.
40. Hoof.

THE HORSE.

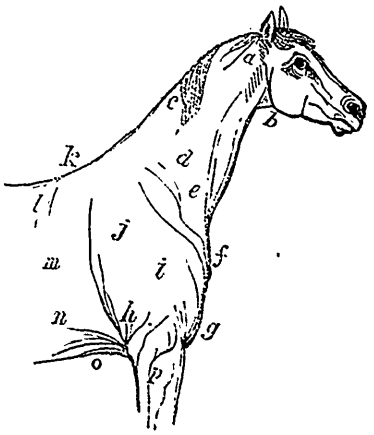
The Anatomy of the Muscles.—The bones of the whole body constitute a frame-work to which the numerous muscles (which are concerned in, and are the means of the various motions of the animal) are attached. The bones are not smooth, but have an uneven surface, and present depressions and elevations; these elevations are like nipples, and are called nipple-shaped processes, or tubercles, the muscles are attached. The bones are levers, and the power of their motion is the muscles.

In our discussions we propose to direct attention mainly to those bones and muscles only which are concerned chiefly in the travelling, carrying, and drawing motions of the horse. These bones and muscles are mostly those of the body and legs, and consequently the body and legs, in their bony and muscular anatomy, will be treated of. We content ourselves with an enumeration of the bones of the head, as the head is only in a small way employed in motion of draft. The power it has over either arises from its elevation or depression. When the horse increases his pace he lowers his head, if it be free; when he is called on for greater exertion in draft, he also lowers his head. Without this depression of the head, and that to the level of the body, he cannot reach the height of his speed, nor the utmost of his power or draft. In ordinary motion or draft, the head is not so low as the level of the body, it is only in his higher and more powerful exertion, in either speed or draft, that the horse brings his head to the level. It is then the position of the head, and not its power, which is concerned in motion or draft. Consequently, in animal mechanics, it is relatively of small consequence. The head is not even held up in its natural position by the muscle, but by a strong ligament or cord called the pack-wax, which is attached to the head at one end, and on the withers at the other, and hence into the muscle of the back. When, however, the head is to be depressed, the muscles of the neck and shoulders are called on to do it. Thus the bones and muscles of the neck, as well from their shape as from their size, are of importance in the power of the horse for motion.

Muscles of the Neck.—We shall first consider the muscles of the neck. They lie chiefly in the lower part of the neck, and end in tendons at or near the head. Those concerned in the

raising and lowering of the head and turning it in various directions, make a complicated system. Two of the most important of them are the *splint-like* muscle and the large complicated muscle. The splint-like muscle constitutes the bulk of the neek on its upper side and is attached to all the bones of the neck except the upper one, called the *atlas*, nearest the head. From this muscle a tendon goes to and attaches itself to the atlas and the bones of the temples. Its office is to elevate the head and neck, and for this it is very powerful, as it must needs be; upon it depends the beauty of the neck. As it is more or less arched, but it should be light above, and large below and at the junction of the neck with the shoulder. From it arises the thickness and muscularity of the neck, and if full at the lower part and light at the upper part of the neck, the neck itself when joined well to the head, will be perfect. Clumsy necks arise from too much cellular substance or fat, and not from this muscle, as also do lofty crests. Mares and geldings rarely have clumsy necks or lofty crests.

The large complicated muscle is the largest and most powerful in the neck. It arises from the five lower bones of the neck, *d*, *e*, at its upper part, as it nears the head, it lessens its bulk and unites in part with the same tendon as the splint-like muscle, but is principally joined to the bone of the back of the head. It assists to raise the head and neck, and it is particularly concerned in raising and thrusting forward the nose. When too powerful, it makes the nose *stick out*, and deforms the horse. The martingale is used to counteract the force of this muscle. When this muscle is very large and the splint-like one quite small, the horse will be ewe-necked hollowed (or at least straight) above and projecting below. In such a neck the nose protudes and can hardly be got down.



The Muscles of the Neck.—The *small* complicated muscle, the *straight*, and the *oblique* muscles of the upper part of the neck, attached mainly to the two upper bones of the neck, are also employed in raising the head.

One of the muscles used to lower the head is attached to the breast bone, and lies next to the skin; it proceeds up the neck, and near the head changes into a tendon, and is inserted into the lower jaw near its angle, *b*. It is used to bend the head towards the chest. Another muscle concerned in lowering the neck, springs from the back of the head, and the first or four upper bones of the neck, and the pack-wax proceeds downward, mixes with the muscles of the shoulder, and attaches itself to the lower shoulder bone; it also assists in raising the shoulder.

The muscles of the neck are all double (in pairs,) one on each side of the neck. To raise or depress the head they must act together. To turn the head and neck to one side, one only must act, on the side to which the head and neck are to be turned; if an elevating muscle, then they will be turned at the same time; if a depressing muscle then lowered and turned. Thus is provision made for every kind of motion of the head and neck.

Muscles of the Breast.—The muscles of the breast are very important. They are largely concerned in the expansion of the chest; and are the power by which the arm in rapid motion is confined to the side, and thus keep the leg in a straight line before the horse. The chief of these is the pair of *transverse muscles* of the breast, They form two full points in the front of the upper and front part of the breast, consistng of the four first bones of the breast and are attached to the lower end of the lower bone of the shoulder, extend backward between the legs, pass across the inside of the arm, and reach from the elbow almost to the knee. These muscles act to place the fore legs in that position, which will allow them to receive the weight of the body in the easiest manner, and with the least shock.

The *great* and *small muscles* of the breast lie above and behind the transverse muscles; they extend from the breast bone to the arm of the shoulder. Their office is to draw back the point of the shoulder and bring it into the upright position. There is still another muscle which goes from the breast bone to the shoulder blade. It assists in the same office as the great and small breast muscles. It is less in size than either of the others. A horse not well developed in the muscles of the breast will be deficient in power. He will not have the power to expand perfectly the chest, so that the lungs must suffer, taxed by

violent motion to increased action; and this even if the lungs be large enough. Nor will the horse be able to use his fore leg to advantage. Their breast muscles must be large to allow the horse to avail himself of the full power of the muscles which are used to propel forward his carcase. The progressive muscles have enough work of their own to do, and will not long last if called on to do that of other parts. These breast muscles have more to do in supporting the weight of the body and giving direction to motion than in creating motion; if they be not competent to their office, other muscles are called upon to overwork themselves to supply the deficiency, viz; the muscles of the shoulder and haunch in motion, and the muscles of the belly (abdominal muscles) in breathing. Then the breast muscles should be large to produce and preserve a proper balance both in action and breathing.

FRENCH CONTRACT FOR ENGLISH CAVALRY HORSES.

For the last few weeks a great number of English horses have been exported to France, on account of the French government. There are several agents at present in this country for the purpose of making some very large purchases of chargers for the remounting of the French cavalry regiments, both heavy and light. The contract is for 12,000, at the price of £25 per horse, for the light cavalry, and £28 per horse for the heavy troops—Cuirassiers, Carbineers, dragoons, artillery.

The above paragraph we cut from one of our English papers. It teaches the farmer the advantage of rearing an improved stock. Here is France with a much larger and more fertile country, and yet she is tributary to her great rival, England, for the well mounting of her cavalry troops. What a disgrace to France this is, and what honor to England.

At the famous battle of Waterloo, one regiment of English cavalry was so superior to any in the French lines, that in every charge, they easily rode right over the French horses, completely discomfitting them with scarce the necessity of pulling a trigger or drawing a sword. It was the superior breed of the English horses, alone, that enabled them to accomplish this.

There is nothing superior to a first-rate American horse; and if our farmers will only breed from the best animals, we should soon have such a numerous stock in the country as the world never yet saw, out of Arabia.—*Am. Agriculturist.*

To Measure Hay in Stacks,—"More than twenty years since," says an old farmer "I copied the following method of measuring hay, from some publication, and having verified its accuracy, I have both bought and sold by it, and believe it may be useful to many farmers, where the means of weighing are not at hand. Multiply the length, breadth, and height into each other, and if the hay is somewhat settled, ten solid yards will make a ton. Clover will take from ten to twelve yards per ton."

Portable Steam Engine for Farm Purposes.—This engine is a beautiful piece of mechanism of half-horse power, working to a charm. It was operated in the hall, and attracted great attention. It propelled a grindstone, lathe, straw cutter, &c., working with ease at from 500 to 800 revolutions perminute. With it, a farmer might saw his wood, cut his straw and hay, grind his tools, steam his potatoes and other feed with the surplus steam, and while thus operating, save the labor and board of two or three men. It is well worthy of careful attention, and if durable, of general encouragement. It requires from 1 to 1½ cents' worth of fuel per hour, to propel it, and costs only $75.—*Trans. N. Y. Ag. Soc.*

Storing winter Cabbages.—Such cabbages, at the extreme north, as you wish to keep through the winter and early spring, may be pulled up by the roots, and arranged in compact rows, with their heads downward, resting on the surface of the ground, so that their stalks will stand upright in the air; then, they may be covered with straw and earth, and treated in every other respect as directed for root crops. Should the weather be unusually warm, the earth and straw should be opened to let in air.

STORM GLASS.

This instrument consists of a glass tube sealed at one end, and furnished with a brass cap at the other end, through which the air is admitted by a very small aperture. The tube is nearly filled with the following solution, which may be obtained of any apothecary or chemist:—

Camphor, 2½ drachams; nitrate of potash, 38 grains; muriate of ammonia, 38 grains; water, 9 drachams; rectified spirit, 11 drachams. Dissolve with heat. At the ordinary temperature of the atmosphere, plumose chrystals are formed.

On the approach of stormy weather, these crystals are often observed to occupy only the bottom of the tube, where they appear to be compressed into a compact mass; while on the other hand, during the fine weather, they assumed their plumose character, and extend a considerable way up the glass.—These results depend upon the condition of the air, but they are not considered to afford any indication that can be relied upon of the approaching state of the weather. When exposed to a very low temperature, the compound camphor liniment bottle affords the same appearance and indication as these storm glasses. —*Pharmaceutical Journal.*

General Science and Miscellany.

PROFESSOR MITCHELL ON BIBLICAL ASTRONOMY.

Professor Mitchell delivered another of his series of lectures on Biblical Astronomy, in the Hope Chapel, last evening. As was the case on former occasions, his audience was large, and he was listened to throughout with great attention. During the evening, he read a variety of extracts from the Book of Job, and commented upon them in his peculiarly eloquent style. In reference to the allusion to the foundations of the earth, the lecturer inquired where are its foundations—by whose power is it guided—who supports it? Who is it that keeps it steady in its career, and causes it to subserve the great objects for which it was designed? We know not—it is impossible for us to answer. If we ascribe it to the power of gravity—what is it? It is the expression of the will of God. We can't go beyond that, and having reached a certain limit, we find that the human mind can't go beyond it. Again, "Hast thou commanded the morning since thy days, and caused the day-spring to know its place," &c. Hast thou so constituted the earth that it shall revolve for ever and ever with perfect uniformity, and cause the day to know its place with absolute certainty? Here he said, we have a remarkable allusion to the most wonderful facts connected with the history of the world. If the axis of the earth was not perfectly stable, then the day-spring from on high could not know its place, nor would there be any certainty in regard to the rising and setting of the sun, nor any uniformity in the seasons. Of the millions of axis which may be drawn through the earth, there is but one of them all on which it can rotate, so that it will preserve its position and cause that uniformity which we possess. So uniform is that rotation, that for two thousand years, it has not varied the one hundredth part of a second. But is it necessary that this motion should be uniform? He should say no. There is no planet which moves with perfect uniformity, but in the motion of the earth on its axis, there is absolutely no change. Suppose that in launching the earth into space, it had been established as a law that it would be perpetually losing a small amount of its velocity in its rotations, what would be the result? It would lose from time to time, and in the end, its destruction with that of all life, on its surface would be the consequence. If on the other hand the velocity of its rotation was increased, what would be the result? The whole mass would disintegrate and portions be thrown off at the equator. But God has given us a guarantee that these changes will not take place—he has guaranteed as on the right as well as on the left.—*N. Y. Paper.*

The Rolling Stone Gathers No Moss.—A very sensible little item against the universal all-pervading disposition of American farmers to migrate—a disease that is often destructive to life, very often to health, more often to comfort and happiness, and still more often to a systematic course of improvement, by which the "old homestead," that is abandoned on account of its unproductiveness, would become fertile again, and yield a greater profit than some of the rich lands of the west.

VENTILATION.

We copy from the *Globe* a brief outline of a Lecture on the important subject of *Ventilation*, delivered at the Mechanic's Institute of this city, on Friday the 30th ult., by H. Ruttan, Esq.:—

There was an audience of upwards of *100 persons*, including a good many ladies. Mr. R. began by describing what pure air is, and then proceeded to show the manifold causes of impure air, which consists not only in that expelled from our lungs in breathing, but is generated also by exhalations from every animal or vegetable matter, decayed or otherwise, which is found in our houses, streets or fields. But, if it is said we must take the air as it comes to us, that is sheer nonsense, for the same thing might be said regarding water. There is pure and impure of both, and as no sane person would drink of filthy water merely because it was the first at hand, but would look for clean, so it is as insane for people to take no heed as to the qualities of the air they breathe. The Lecturer after reading extracts from Liebig and other authors, showing how impure air was generated and what were its pernicious effects if breathed, proceeded to speak of the different means which have been employed to disperse this impure air, and to supply it pure, in other words, ventilation. He blamed architects for their total inattention to this most important part of their duty. As medical men are required to have a knowledge of the anatomy of the human body, so ought architects with respect to the anatomy of houses; but in this so-called utilitarian age there are very few houses built that can be inhabited with comfort. Architecture has been retrograding these last 3000 years. Many of our Canadian churches are proofs of it. Large sums are expended on fine Gothic churches, with roofs 50 or 60 feet high, and which can never be made comfortable (not to speak of the minor inconveniences of not hearing the preacher), while by having a flat and at the same time a lower ceiling with a proper system of ventilation, these defects would be remedied and less debt burden the congregations. Then in dwelling houses, bed rooms are so placed and furnished, that it is wonderful how we escape the bad effects with so much impunity. They are put at the top of the building towards which all the impure heated air from kitchens and sitting rooms ascend. The carpets and curtains, and such like furniture, collect noxious particles of all sorts that do their share in vitiating the air. Bed rooms ought to be as bare as possible, and especially sick bedrooms. Indeed, carpets should be used in no room in any house. They are uncleanly, and consequently unhealthy. Kitchens ought not to be under sitting or bedrooms, but in out buildings; neither ought vegetable or animal food to be kept in any cellar under the house. By his plan the inconvenience of the present method is obviated, which by admitting the current from below, diffuses air little if any different from that which it expels. *He did not enter into* the details of his new plan, nor show how the natural direction of heated air upwards was to be overcome, giving as a reason that it would be too dry for a mixed audience. The lecturer was much applauded during the reading of his very interesting lecture, which occupied upwards of an hour.

GOLDEN RULES OF LIFE.—All the air and the exercise in the universe, and the most generous and liberal table, but poorly suffice to maintain human stamina, if we neglect their co-operatives —namely, the obedience to the laws of abstinence, and those of ordinary gratification. We rise with a head-ache, and we set about puzzling ourselves to find out the cause. We then recollect that we had a hard day's fag, or that we feasted over bounteously, or that we stayed up very late; at all events we are inclined to find out the fault, and then we accuse ourselves of folly for falling into it. Let any one individual review his past life, how instantaneously the blush will cover his cheek when he thinks of the egregious errors he has unknowingly committed—say unknowingly, because it never occurred to him that they were errors, until the effects followed that betrayed the cause. All our sickness and ailments mainly depend upon ourselves. There are thousands who practise errors day after day, and whose pervading thought is, that every thing which is agreeable and pleasant cannot be hurtful. The slothful man loves his bed, the toper his drink, because it throws him into an exhilarative and exquisite mood; the gourmand makes his stomach his god; and the sensualist thinks his delights imperishable. So we go on, and at last we stumble and break down. We then begin to reflect, and the truth stares us right in the face how much we are to blame.

FARMING SCENES IN THE WEST.—About eight years ago a Dutchman, whose only English was a good-natured "yes" to every possible question, got employment here as a stable-man. His wages, six dollars and board; that was thirty-six dollars in six months, for not one cent did he spend. He washed his own shirt and stockings, mended and patched his own breeches, paid for his tobacco by odd jobs, and laid by his wages.—The next six months, being now able to talk good English, he obtained eight dollars a month, and at the end of six more had forty-eight dollars. The second year, by varying his employment—sawing wood in the winter, working for the corporation in the summer, and making gardens in the spring—he laid by a hundred dollars; and the next year one hundred and fifty-five dollars. With this he bought 80 acres of land. It was as wild as when the deer fled over it and the Indians pursued him. How should he get a living while clearing it.—Thus he did it; he hires a man to clear and fence ten acres; he himself remains in town to earn the money to pay for the clearing. Behold him already risen a degree—he is an employer! In two years' time he has twenty acres well cleared, a log house and money enough to buy stock and tools. He now rises another step in the world, for he gets married, and with his amply broad-faced good natured wife, he gives up the town, and is now a regular farmer. In Germany he owned nothing, and never could; his wages were nominal, his diet chiefly vegetables, and his prospect was, that he would be obliged to labor as a menial for life barely earning a subsistance, and not leaving enough to bury him. In five years he has become the owner in fee simple of a good farm, with comfortable fixtures, a prospect of rural wealth, an independent life, and, by the blessing of heaven and his wife, of an endless posterity. Two words tell the story —industry and economy. These two words will make any man rich in the West.—*Indiana Farmer.*

DUTCH WOMEN.—Coleman, in his "European Life and Manners," gives the following description of the Dutch women:

"I think some of them the fairest and handsomest creatures I ever looked upon, and made of the finest unmixed porcelain clay. Before I left England, I thought the English women the finest I had ever seen —I now consider them as belonging to the colored races. The Dutch women much exceed them. Take the fairest rose that was ever plucked, with the glittering dewdrops hanging among its petals; take the fairest peach that ever hung upon the tree, with its charming blending tints of red and white, and they are eclipsed by the transparency and beauty of complexion of the fairest of the Dutch women, as I saw them at Broeck and Saardam. If their minds are as fair, and their manners as winning as their faces, then I can easily understand the history of Adam's fall. It was impossible, poor fellow, that he should resist. Then their costume is so pretty and elegant. A sort of thin gold helmet fitting close to the head, leaving enough of the hair to part gracefully over the brows; a thin, but wide band of highly wrought and burnished gold, with splendid ear-drops of gold or of diamonds set in gold, with a beautiful cap of the finest Brussels lace, covering, but not concealing, the whole head, and all the rest of the dress of vestal purity; white, tasteful, transparent, with short coats, shoes as bright as mirrors, and stockings of the purest white, and fitting the ankle as if they were knit upon the limb; with no drabbling train to sweep the pavement, and no oversized shawl, and loose and ill-fitting sleeves and skirts, hanging about the person like clothes upon an old tree on a washing day, and you'll have some faint notion of what one of these creatures is."

THE SEA.—In the wide sphere of bright creation, there exists naught that hath for man so deep a "tone" of meaning as the fathomless, eternal sea—that resplendent shield, guarding the verdant universe. It hath smiles for him in his gladness, when the glorious sun, dancing over the tameless waves, lights them into beauty; it hath a garb of mourning for his sorrow, when it reflects the dark cloud sailing over it, and rocks the shadow within its bosom; it hath notes of laughter for his hour of wassail and of song, when its free bright waters leap to shore with a sound of bounding mirth; and it hath a trumpet for the victor, when it raises its voice amidst the storm, and sends its billows gleaming on high, like mighty standards! Thou hast within thy depths, O sea! gems to deck the brow of the beautiful, wealth to lure the aspirations of the avaricious, and groves of the rich red coral to haunt the poet's dream. Thou hast, too, thy treasures amongst the dead, to fill the soul of the mourner. Thou art, O sea! "the deep heart of earth, imaging its beauties, thoughts, and passions."

REVENGE.—When the mind is in contemplation of revenge, all its thoughts must surely be tortured with the alternate pangs of rancour, envy, hatred, and indignation; and they who profess a sweet in the enjoyment of it, certainly never felt the consummate bliss of reconciliation; at such an instant the false ideas we received unravel, and the shyness, the distrust, the secret scorns, and all the base satisfactions men had in each other's faults and misfortunes, are dispelled, and their souls appear in their native whiteness, without the least streak of that malice or distaste which sullied them: and perhaps those very actions, which (when we looked at them in the oblique glance with which hatred doth always see things) were horrid and odious, when observed with honest and open eyes, are beautious and ornamental.

Laziness grows on people; it begins in cobwebs, and ends in iron chains. The more business a man has to do the more he is able to accomplish; for he learns to economise his time.

ELECTRO MAGNETISM, AS A MOTIVE POWER.

Professor Page, in the lectures which he is now delivering before the Smithsonian Institute, states that there is no longer any doubt of the application of this power as a substitute for steam. He exhibited the most imposing experiments ever witnessed in this branch of science. An immense bar of iron, weighing 160 pounds, was made to spring up by magnetic action, and move rapidly up and down, dancing like a feather in the air, without any visible support. The force operating upon this bar, he stated to average 300 pounds through ten inches of its motion. He said he could raise this bar 100 feet as readily as through ten inches, and he expected no difficulty in doing the same with a bar weighing one ton, or a hundred tons. He could make a pile driver, or a forge hammer, with great simplicity, and could make an engine with a stroke of six, twelve, twenty, or any number of feet.

The most beautiful experiment we ever witnessed, was the loud sound and brilliant flash from the galvanic spark, when produced in a certain point in his great magnet. Each snap was as loud as a pistol, and when he produced the same spark at a little distance from this point, it made no noise at all. This recent discovery he stated to have a practical bearing upon the construction of an electro-magnetic engine. Truly, a great power is here; and where is the limit to it?

He then exhibited his engine, of between four and five horse power, operated by a battery, contained within a space of three cubic feet. It looked very unlike a magnetic machine. It was a reciprocating engine of two feet stroke, and the whole engine and battery weighed about one ton. When the power was thrown on by the motion of a lever, the engine started off magnificently, making 114 strokes per minute; though, when it drove a circular saw ten inches in diameter, sawing up boards an inch and a quarter thick, into laths, the engine made but about eighty strokes per minute. There was a great anxiety on the part of the spectators to obtain specimens of these laths, to preserve as trophies of this great mechanical triumph.

The force operating upon the magnetic cylinder throughout the whole motion of two feet, was stated to be 600 pounds, when the engine was moving very slowly, but Professor P. had not been able to ascertain what the force was when the engine was running at a working speed though it was considerably less. The most important and interesting point, however, is the expense of the power.

Professor Page stated that he had reduced the cost so far, that it was less than steam under many and most conditions, though not so low as the cheapest steam engines. With all the imperfections of the engine, the consumption of three pounds of zink per day, would produce one horse power. The larger the engine, (contrary to what has been known before,) the greater the economy. He was himself surprised at the result. There were yet practical difficulties to be overcome; the battery had yet to be improved; and it remained yet to try the experiment on a grander scale, to make a power of 100 horses or more.

Truly, the age is fraught with wonders, and we can only now look forward with certainty to the time when coal will be put to better uses than to burn, scald and destroy.—*National Intelligencer.*

IMPORTANT DISCOVERY—LARD RENDERED FLUID BY MIXING WITH ROSIN.

Professor Olmstead of New Haven has lately made the important discovery, that, by adding one pound of powdered rosin to three pounds of Lard, well stirred together the mass becomes semi-fluid at 72° F., and on being melted, which it does at 90° notwithstanding if melted alone the rosin requires 300° and the lard 97° of heat, the compound will remain transparent and limpid at that temperature. As it cools, a pellicle begins to form on the surface at 87°; and at 76°, it remains a dense semi-fluid.

The discovery of the above named fact will be of great importance to those who use lard lamps, as the lard is rendered more fluid by the rosin, and the power of illumination increased two fifths; yet, after two hours' burning, it looses its brilliancy on account of the wick becoming clogged. This will not be an important objection in families, while in point of economy the gain will be considerable; for lard is worth three or four times as much as rosin.

To machinists, this discovery is very important, as it enables them to make use of lard, instead of oil, which is not only a saving in cost, but what is of far more importance, the addition of the rosin completely neutralises the quality of acidity in the lard, which corrodes metals, particularly brass and copper, to such a degree that it is unfit to apply to anything not in constant use. Professor Olmsted says, a thin coating of the compound laid upon a grate or sheet-iron stove with a brush, as thin as possible, will keep it free from rust all summer, although stored in a damp place.

To soap makers, the discovery is also important. If one pound of the compound is added to two pounds of common Windsor soap, the quality is greatly improved, and the tendency that soap has to grow rancid, when in use or kept moist, is thus entirely prevented. A shaving cream of an excellent quality, may be made by taking a cake of good shaving soap and steaming it soft in a close cup, and mixing half its weight with the compound, and working it well together; adding a little oil of almonds or any other agreeable flavor.

The same compound applied to boots and shoes renders them nearly impervious to water, and if applied to the soles, will not soil the floor. The uppers will be soft and pliable, and not prevented from receiving a blacking polish.

For oiling carriages, the mixture of lard and

rosin will be valuable; and when wanted for heavy wheels, a proper consistency may be given to it by adding wheat flour, or if greatly preferred, black lead.

No doubt the soap paste above described would be a good lubrication for carriage wheels. We hope this discovery will increase the consumption of lard, and thereby give an improved market to the farmer, and thus enable him to turn land into lard, and lard into light, and in the meantime enlighten his mind *and* improve his condition.—*Am. Agriculturist.*

To Prevent Fermentation in Cider, Wine or Beer.—Add a small quantity of sulphite of lime; or bruise mustard seed, 14 ounces to 1 ounce of cloves, and add to the liquid when first put into the cask; or a small portion of each may be added. The article is sulph-*ite* and not sulph-*ate* of lime. It is quite innocuous in any quantity.

Arrack.—This is a spirituous liquor produced from distillation of palm wine, and also from a fermented infusion of rice. It is a drink much used in the East Indies, among some of the semi-barbarious nations. Opposed as we are to all intoxication beverages, we cannot recommend its introduction into this country, unless it were upon the same principle we would tolerate wine, cider, and beer, as less likely to produce drunkenness than whiskey. A great fire is sometimes checked by a smaller one.

New Steering Wheel.—This invention has been patented by Capt. Fayrer, R. N., for England, Scotland, and France. We have received a copy of the drawings, necessary for showing the construction of the apparatus, and will be happy to shew it to parties who may be desirous of putting it into their vessels. We should think it of peculiar benefit to vessels, which running the rapids of the St. Lawrence require great nicety and great power at the wheel.—*Montreal Gazette.*

Making Brine—*For the use of Young Housekeepers.*—Dissolve four pounds of good salt in each gallon of water. Add a few handfuls of small lumps of rock or coarse salt to each cwt. of meat, as you pack it, before putting on the brine. This will maintain its strength. If the pieces of meat are small and lean, they will absorb salt enough to be palatable, in three days. You may then take it out, and if the weather is cool, keep it hung in a dry room, or pack it dry in coarse salt.

Housewife's Cream.—Take half a pint of good cream, a quarter of a pint of white wine, a teacupful of pounded white sugar, and the rind and juice of one lemon. Put all into a large basin, and whisk till it becomes quite thick: then put into glasses, and let them remain in a cool place till required [This cream is better if made the day before it is wanted; and it will keep good for several days, if the weather is not too warm.]

Rice Fritters.—Slice the rind of a lemon, and boil it in milk, with sugar enough to sweeten it and a cup of rice. When the rice is quite soft, take it out; beat up the rice with a glass of brandy, shape it into fritters, brush them with yolks of eggs, cover them with bread crumbs, fry them in butter, and serve them up with lemon juice squeezed over them.

Rice Balls.—Pour upon half a pound of rice three pints of boiling milk, and boil it with a little cinnamon, sugar and lemon peel, until it is quite tender; allow it to remain until it is cold, and then make it into balls. Beat up two eggs, roll the balls in it, and afterwards in grated bread crumbs; fry them in lard drain them on a piece of paper, and serve them up with sifted sugar.

To Burnish Britannia Ware.—In burnishing Britannia ware, rub the surface gently, in the first place, with a woolen cloth, dipped in sweet oil; then wash in tepid suds, rub with soft leather and whiting. Articles burnished in this way retain their lustre till the last, if carefully used.

Substitute for Soap.—A late French author recommends potatoes, three fourths boiled, as a substitute for soap in washing hands. The use of this prevents chapping in cold weather, and retains the skin soft and healthy.

Chemical Facts.—Soils may contain silica and alumina; a plant may contain silica, but no alumina. Animals contain neither silica nor alumina.

Trenching Old Orchards.—If you have any neglected old trees in your orchards fork or trench up the earth all around their trunks for a distance of four or five feet, and give to each tree at least a bushel of compost, made of equal parts of stable manure and leaf mould or swamp muck. And at the top of this, spread half a peck, to each tree, of charcoal dust, wood ashes, and oyster-shell lime.—*American Agriculturist.*

Specimens of beautiful black, white and variegated Marble have been discovered at Five Islands, Nova Scotia, which is said to be superior to Italian. A sample has been sent to England by the Hon. Mr. Howe, who recently set out as a delegate from Nova Scotia on the railway question.—*Morning Chronicle.*

Industrial Exhibition.—We have been requested to mention—and we have pleasure in doing so, for we think the idea is a good one—that the "Executive Committee" have determined, provided the suggestion meet with the approval of the members of the Canadian "Fourth Estate," to send to the Grand Industrial Exhibition in London, a handsomely bound volume, composed of copies of every Newspaper in the Colony: and, with this view, they have to request that the proprietors will forward to the Secretary of the Committee, John Leeming, Esq., the first copy of each Journal, issued for the year 1851. Now, gentlemen, mend your pens, sharpen your cissors!—*Montr Herald.*

Editor's Notices, &c.

CANADA; PAST, PRESENT AND FUTURE.
By W. H. SMITH, author of the "*Canadian Gazetteer.*"
Toronto: Thomas Maclear 45 Yonge-street.

When we call to mind the fact, how little is really known of the condition and capabilities of Canada, not only in the mother Country, but also to a large extent among ourselves, we are ready to welcome any guide that is of a trustworthy character. The people of England commonly associate six or eight months of the Canadian year with biting frosts and overwhelming snows. Few understand the difference which obtains in climate, soils, and their productions, as one travels from East to West in these extensive regions; and fewer still, accustomed to the fogs and alternate freezing and thawing incident to the winters of the old country, can form any adequate conception of the clearness of our atmosphere, the brilliancy of our skies, the ease and facilities of travelling, during the severest portion of a Canadian winter.

And how little generally do those for example who inhabit the banks of the noble Ottawa, know of the inhabitants, soils and productions to be found in the rich valley of the Thames! One principal reason why we have so often advocated the annual publication, in an accessible form, of a condensed agricultural report, compiled from the reports of all the societies in the Province, is that the people of one part might be made acquainted with what is doing in another. As the country becomes more thickly settled, and Education and Enterprise arouse the dormant powers of the mind, such knowledge will be eagerly sought and properly appreciated.

The publication, whose title we have placed at the head of this article, judging from the first part that is now before us; seems admirably adapted to supply a desideratum which has long been felt in our Colonial literature. The author has already earned a reputation in this particular department, by his useful Gazetteer, published a few years ago, and which has been well received by the public. The present work, however, differs materially from that publication, not only in form, but more particularly in the extent and completeness of its information, The first part contains a neatly engraved map of the Counties of Essex, Kent and Lambton, and 112 octavo pages in a clear, bold type; each part will contain a map, forming when the work is completed an accurate delineation upon a sufficiently large scale, of the whole of Upper Canada. In the part before us, we have a copious account of the counties above mentioned, together with Middlesex and a portion of Oxford. The date of settlement of the several townships, character of the soil, value of land, population returns, state of the industrial arts and manufacturing capabilities; with an amount of general statistical information, all so clearly set forth as to give the reader a correct and distinct idea of the subject. In works of this sort the correctness of the details is the most important and essential quality, and in order to ensure this, Mr. Smith is again visiting in person, every portion of the Province; a fact which cannot fail to strengthen the confidence of the public in the trustworthiness of his statements. A judicious use is made of Government and Custom House returns and the reports of public bodies, not omitting the very accurate and important information, which is well known to be contained in our Geological Surveys; but although the writer very properly, we might say necessarily, has recourse to these authentic sources of information, we think it only bare justice to state, that the work is not a mere compilation; but by far the larger portion, judging from the manner in which the subject is treated in the first number, will consist of original composition.

We have no space for extracts, and, in fact, no adequate notion of the work, as a whole, could be formed from selections that would come within reasonable bounds. We strongly recommend our readers to inspect it for themselves. The most important secular knowledge is that which relates to the country of one's birth or adoption. A few well selected books of high character, on subjects with which it is essential that every good and intelligent citizen should be conversant, are worth a whole library of trash; in fact we should regard the possession of the latter as among the greatest misfortunes with which any family could be afflicted.—We hope therefore for the good of our country, that the present work will be extensively circulated, not only in Canada, but in the British Isles, where full and correct information is so much needed; that people may learn what this country really is, and what industry, intelligence and integrity, with God's blessing are capable of making it through its future developments.

We have only to observe further, that the work is published in numbers at 1s. 3d. each, and in parts of double size at 2s. 6d.: each part will be accompanied by a map and about ten parts will complete the whole. We heartily wish both the author and publisher, that success, which their labor and enterprise ought not to fail of securing.

A PLAN OF SETTLEMENT AND COLONIZATION ADAPTED TO ALL THE BRITISH NORTH AMERICAN PROVINCES.—BY JAMES FITZGERALD, ESQ.

Just as we were going to press a Pamphlet bearing the above title has been put into our hands. The author a resident of this city, has had an experience of nearly a quarter of a century in Canada; and from the interest which he manifests in his subject, his opinions and suggestions are fairly entitled to a respectful consideration. The work consists of a series of letters addressed to a friend in Ireland, detailing the author's views on a system of Colonization, adapted alike to the wants of these Provinces and the mother country. It also includes several letters addressed by the author, at different times, to the Governor General, the Commissioner of Crown Lands, and the office bearers of some of the Agricultural Societies. As the subject of Colonization and the beneficial occupation of our wild lands is of paramount importance to the best interest of the country, we doubt not but this pamphlet will meet with an extensive reading. We may hereafter revert to it more at large. It may be procured of the booksellers in Toronto, and we presume, in other places; price, half-a-dollar.

RECEIVED. The 12th number of the *Farmer's Guide*, completing the first volume, including Professor Norton's appendix to Spring.