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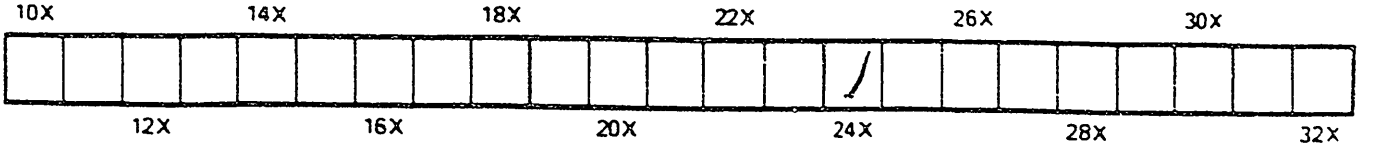


THE

CANADIAN AGRICULTURAL JOURNAL.

VOL. II. MONTREAL, MAY 1, 1815. No. 5.

During our long residence in Canada, we have not heard of a public lecture on the subject of agriculture, its importance, or the best mode to be adopted for its improvement, though we have had lectures in abundance on almost all other subjects, however insignificant. It was the only subject that was of importance, above all others, to every class in the country, that had no sufficient interest in the estimation of public lecturers. We cannot assign any particular cause for this, except that educated men here are learned in everything but in that which would be most useful to themselves and others to know. It is, indeed, strange how we estimate things, and how they are estimated by mankind generally. That sort of knowledge which might be most usefully employed for the benefit of the human race, is neglected, if not despised, while that which at best is only secondary, as regards our temporal happiness, is sought after and honored. Those who possess the means of giving or obtaining what is considered a good education, never think it could be necessary for an agriculturist. Hence it is that our best educated men have no connection generally with agriculture, and they employ all their acquirements for their own benefit and gratification, and do not appear to think it should be employed for any other purpose or object. We have not here, as in England, a class of men who can afford to spare a part of the knowledge they have acquired from a perfect education, for the benefit of those who have not been born under such fortunate circumstances as themselves. All the knowledge acquired by the best educated men here, they appear to think necessary for themselves, and cannot spare any of it for the benefit of the public, unless they can sell it at a price To these causes chiefly we attribute the backward state of our agriculture, and the indifference of the best educated classes to its improvement and prosperity We have had ample opportunity to ascertain these facts, and we do not make the assertion without sufficient grounds. The object of our own agricultural publications has been to endeavour to remedy this evil, by attracting attention, and exciting some interest in behalf of agriculture, that the matter might be seriously taken up by men who were in such circumstances as to enable them to adopt measures for its amelioration, if they could only be induced to act, and take some trouble to effect the necessary improvement. This has been our untiring object for many years, and we have devoted a large portion of our time and pecuniary means to accomplish it, though we have not been successful. So far have we been from receiving that support and countenance which we might have reasonably expected, we experienced the contrary. We are happy, however, to acknowledge that there are exceptions, and we wish it would be proper to name the individuals to whom we are obliged, but we beg of them to accept this acknowledgement, when we cannot offer them our thanks more openly. This publication was not commenced or continued for party purposes, or to make profit by it, but to advance, if possible, the improvement of agriculture, and augment the quantity and value of its products, as the basis upon which alone the general prosperity of Canada can be built. Parties may be often in error, and their policy not be the very best that could possibly be adopted in all cases and circumstances, but of the necessity and expediency of introducing all possible improvement in the Canadian system of husbandry, there cannot be any doubt or mistake whatever. This being a fact that is incontrovertible, we cannot find any reasonable excuse for those who are more interested in parties and their opposite policy, than in what could not fail to be for the general welfare. If we had attached ourselves to any particular party, and made our Journal a political one in support of that party, we probably would not have any cause to complain of want of support; but as our object was to promote the general welfare, and was unconnected with parties and classes, we failed in creating any interest in the subject. When we could not show clearly that the cause we advocated would decidedly and di-

rectly bring dollars to the purses of all those who would support our views, or would increase the power and influence of political parties, we have been unsuccessful in exciting an interest in our publication, or obtaining sufficient support. We were so sanguine in our hopes of general support, that we sent our Journal to many individuals who had not ordered it, thinking as the object of the publication must be so well understood, there would be no objection made to support it, as the annual subscription was only one dollar. We would be sorry that any individual to whom we may have addressed it, should imagine that by doing so, we only wished to levy a tax or contribution of five shillings upon them for our own profit. We can assure them there is no profit to us by the publication; and we are so vain as to think we might be able to give any subscriber, whether interested in agriculture or not, the value of his subscription. We offer this explanation to those who returned the Journal, as well as to those who received and refused to pay for it, on the grounds of not having ordered it. We state now that it is not our intention to attempt to enforce payment from any one to whom we send this Journal. If we are paid we shall be thankful, but we shall always consider the subscription only as a debt of honor, or a contribution towards the support of a publication, issued solely with a view to advance the general prosperity of the land we live in. We never would have addressed the Journal to any individual of education or standing in society, who we could have supposed for a moment would have refused to be a subscriber to it, when there could be no mistake about the true object of the publication; but we find we have been mistaken. In reply to our complaint of want of support, it has been said to us, "there was no obligation upon you to write or publish—no one required this at your hands, and you must, therefore, abide by the loss, as it was your own choice. We cannot describe the motives which urged us on better than in terms attributed to the late Rev. Sydney Smith, they are the following:—"I write for three reasons: first, because I really wish to do good; secondly, because if I don't write, I know nobody else will on this subject; and thirdly, because it is the nature of the animal to write, and I cannot help it. Still, in looking back, I see no reason to repent. What I have said *ought* to be done, generally has been done, but always too late done; not, of course, because I have said it, but because it was no longer possible to avoid doing it." I, perhaps, go too far in saying "generally has been done"; but I can say truly, that much of what I have been the first to suggest publicly, has been done, and if all which I have suggested is not yet done, I believe it ought to be done, and the sooner the better.

AGRICULTURAL INSTRUCTION IN SCHOOLS.

At the request of a number of the parochial schoolmasters, Professor Johnston gave a lecture in the High School Hall, Edinburgh, on the introduction of agricultural instruction into elementary schools in Scotland. There was a full attendance of school-masters and others interested in the matter. Mr. Gunn, of the High School, having been called to the chair.

Professor Johnston rose and said, that he should not have presumed to have appeared before them (the parish school-masters,) in reference to so important a subject as agricultural education, had he not been requested to do so by various parties—by members of their own body and others. He had communications from various quarters on the subject, and had also had transmitted to him a memorial addressed to the Lord Justice-General, from a parish school-master, expressing a desire on the part of himself and others of the body, to introduce among the various branches of education taught in their schools, some instruction in the principle and practice of agriculture. Besides, he had been encouraged to bring the matter before them, because of the result of a meeting lately held in Glasgow for the purpose of considering whether it was possible to introduce into elementary schools instruction in the elements of chemistry as applied to agriculture, and that without interfering with the ordinary course of study in these schools. He had previously had some doubts on the subject, but after hearing some boys from the Irish National Schools, who were brought to Glasgow for the purpose, examined, all his scruples had been removed; and being himself satisfied, he now appeared before the present meeting for the purpose of stating his views on the matter. He was encouraged also from what he had since observed in various parts of the country; for he found that there was a general desire on the part of the agriculturists that their children should receive that sort of education of which they themselves were deficient, in order that they might improve their condition in life by cultivating the land to more advantage than had hitherto been done. It was important that such instruction as he alluded to should be given, because the population of the country was a head of the present productive powers of the land, because the land did not now produce enough of corn for the people, and because the land of the country could easily be made to maintain a much larger population; and in doing so, give more profit to the farmer. Scotland was as much advanced in the science of agriculture as any other country; but in every other country it had been demonstrated that the best, cultivated districts might be improved by the application of chemistry to the land. The general persuasion of its importance was such, that Agricultural Chemistry Colleges had been established at Petersburgh, at Moscow, in the West Indies, in England, and also in Ireland. In fact, agricultural schools were springing up everywhere, in a way adapted to the circumstances of each country. He was clearly of opinion, that it was of especial importance to introduce agricultural instruction into our parish and other elementary schools. He need not tell them how difficult it was for the farmer to acquire new and additional information when engaged in the cultivation of his farm; therefore it was of great importance, if the land was to be made more productive, that kind of knowledge

which would conduce to accomplish so desirable an end, should be acquired while at school by those who were to succeed their fathers in the cultivation of the soil. He came now to the consideration of what should be taught. Agriculture divided itself strictly into three branches—1st, the culture and improvement of the soil; 2nd, the rearing and improvement of stock; and 3rd. the use and improvement of agricultural implements. The force of agricultural societies had been mainly directed to the second branch, consequently the improvement of stock had gone a-head of the improvement of the land; and this in face of the fact that the land was the more important of the two, as being the feeder not only of the stock but of the people also. Indeed, he held in his hand a letter from a most intelligent farmer, who stated that the stock was too good for the land. And as the cultivation of the land was of the greatest importance, the other two branches being subsidiary to it, the force of the schoolmasters would be most useful, as it would be most easily directed to teaching in regard to the culture and improvement of the soil. Now, their teaching that might be of two kinds—theoretical or practical, or both. He would come to the consideration of both. He thought that in elementary schools, they might easily inculcate and impress on the minds of the youth under their care the principles upon which the culture of the soil ought to be based. Of the sciences on which these principles depended chemistry was the most important, and it was necessary, therefore, before they could teach the young mind, that they should give a knowledge of so much elementary chemistry as to make him understand the words used by chemists. It was not enough that he should know such names as soda and potash—he should also know the difference between them. They must not teach any one science for its own sake, but as an important branch of national industry. They were to make their pupils—not chemists—not botanists, but scientific farmers, for in that the public were interested and would support them. [Here Professor Johnston referred his audience to a catechism which he had drawn up at the request of the school-masters of Ayrshire]. As to the experiments they would find it necessary to make, they were few and very simple. For instance, here was the carbonate of soda in one glass vessel, and the carbonate of lime in another; take and pour spirits of salt on them, and they would observe carbonic acid gas arise, which extinguished a lighted taper when put into the vessel. They would also perceive that the smoke of the extinguished taper floated on the top of the gas, thereby showing how much was in the vessel. This gas, they were aware, performed most important functions; but it was not necessary to give the boy more information than was requisite to fix in his mind the name and property of the gas. Then as to phosphoric acid—here was a piece of phosphorus, which they would observe, when he burned it under a glass, set up white fumes; all they had to do, therefore, was to tell the boy that those white fumes were phosphoric acid; that the same was in his bones, and in the food which he eats—and he would then easily remember what phosphoric acid was. If they did not happen to have phosphorus by them, they might use lucifer matches, which were easily procured, and which, on friction being applied to them sent up the same sort of white vapour as did the phosphorus which the boy had seen burned. They could also connect carbonic acid with the daily life of the pupil, by telling him that what was produced when charcoal was burned was what he breathed. He would then go and tell his father that this same substance which he throws off from his lungs was what the leaves of plants sucked in; that plants took it from starch, and that animals eat the starch to form it. After making an experiment to show that liquid manure was an important substance if applied to plants, as it greatly promoted their growth, the Professor then went on to say that the more simple the teacher could make his experiments the better—they should teach no more philosophy than was absolutely necessary; but at the same time it must be strictly correct. He would advise them to confine themselves to facts, not to announce the principles He would also press upon them, in endeavouring to fix facts on the boy's mind, to call forth all his senses—his sense of sight for instance. Then as to smell, ammonia might be used; and for taste, common salt, alum, and soda, which were perfectly harmless. As to touch, sal ammoniac would be of use. They would observe that the little piece which he had just broken off, bent; and he knew of no other substance which a boy that was likely to meet with that would bend in like manner. The Professor then directed attention to a set of tables which he recommended for the use of elementary schools—one of them, to which he especially called the observation of the meeting, was an exposition of the ash of the different kinds of grain, namely, potash, soda, lime. magnesia, oxide of iron, oxide of magnesia, phosphoric acid, sulphuric acid, silica, and chlorine. He remarked that such a table as this would tend much to fix the words used by chemists in the memory of the pupils; and also to impress principles upon their minds: as, for instance, that in the ash of all the different kinds of grain, there was more phosphoric acid than any other substance. As to the means of information for themselves, it was a great convenience to him in bringing the subject forward both here and elsewhere, that he could offer them his own books; a few months ago, and he could not have told them where the knowledge they required could be obtained. As to the expense of making the experiments, it would not amount to more than five shillings a year, as the materials could be procured at a very cheap rate. With regard to the apparatus, all that is necessary could be got for thirty shillings from Messrs. Griffin, of Glasgow, who had, at his request, prepared a set of apparatus. Then, as to the time it would occupy to teach the science; why, that was a point on which some mis-apprehension might readily arise. The boys who attended school generally did so for three or four years. Now all that he asked was one hour a week; that was enough to learn all that was necessary to be taught on the subject; but if they could give him two hours he should like it the better, as then there would be time to spare. The children also would learn much without teaching, from seeing the table he had alluded to, and also from experiments. He did not wish this one hour a week should interfere with the usual course of instruction, although it might not necessarily be new or additional time to what was now given to teaching. In fact, he did not wish any of them to teach in one particular way or another; he left that to themselves, merely taking the liberty of giving his opinion in the matter. As to the practical teaching of the science, that could be done in various ways. For instance, they might on a Saturday afternoon go with the boys to a farm in the neighbourhood and describe the operations of the farmer. After telling them all about the rotation of crops—that a green crop followed after grain, and so forth, the teacher might then say let us go now and see how the farmer works. This, he thought, might be of great benefit to the scholars. As to school farms, the system of attaching pieces of land to schools had been adopted in reference to the Irish National schools; it was also done in the schools which had been established in England; and it had been proposed to adopt a similar practice here. But this he did not hold to be indispensable. If he were asked the question, should the school masters have a five acre glebe, he would say that in no case of a parish school did he contemplate that the master should work so many hours a day in his farm and superintend the labour of the boys. A school-master might go to a farmer and talk to him about Latin, which he would not care about, as he did not understand it; but if he could hold the plough, then he would think him a better man.

A vote of thanks was carried by acclamation, and conveyed, through the chairman, to Professor Johnston, for the very interesting and important lecture he had just delivered, as well as for the great impetus he had lately given to agricultural improvement, by the publication of his lectures, as also his catechism. The meeting then separated.

At a tannery, near Leeds (the largest in the kingdom,) the proprietor has at present a contract to supply, to one house alone, 2,000 hides weekly.

THE IMPORTANCE OF SALT AS A MANURE.

It is very evident, as plants and animals had not existed at one period, decayed vegetable matter, and excrementitious and uraniumas could not have supplied nourishment to primary vegetation; and from whence was that nourishment derived? It must be produced from an *alkali*, in contact and chemical union of ammonia with common salt.

When the waters were gathered together, and formed the sea, salt was, as it now is, a main constituent, and the earth contained within itself as a body or substance, destined in a most maraculous manner to combine with it in the economy of animal and vegetable life: that substance was ammonia.

Ammonia being a compound of hydrogen, nitrogen, and carbonic acid, it exists in all animal substances, &c. &c., and is capable of undergoing a great variety of transformations. Its production is not due to animal organism, for it existed before the creation of human beings, and was a primary constituent of the globe itself. The natural tendency of ammonia is to ascend into the atmosphere, and its extreme solubility induces it to combine with the moisture there present. In this shape or form it descends again to the earth, either by the rain or dews.

The sea, in performing its regular functions, yields up its water as a vapour, and in this state carries with it certain minute portions of salt, to be diffused or spread over the surface of the earth by the wind. Tens of thousands of tons of sea-water yearly evaporate into the air, with a corresponding quantity of various salts deposited in it, such as common salt, magnesia, chloride of pottassium, and remaining constituents of the sea-water are thus distributed by the stormy winds to the land; and those we have in the greatest abundance, at the very time we should supply all fertilizations to the soil—say spring and autumn; thus nature has provided for, to a certain extent, by what is known as, at the present time, equinoctial gales. The salt thus diffused by the latter gales gives us two substances—carbonate of ammonia and common salt, sufficient for the production of soda, brought into opposition, or placed against each other, by the wise hand of our Great Creator and an inexhaustible source for a continual supply provided previous to the commerce of vegetation. For when carbonate of ammonia and common salt, in equal proportions, are mixed together in solution, a double decomposition takes place, and a carbonate of soda and muriate (salt) of ammonia are produced. This is discerned from very recent discoveries in chemistry, and suffices to shew the manner in which alkalis and alkaline effects are produced. By the same discovery, we may learn that it is not ammonia or common salt, separately considered, that produces the beneficial effect on vegetation, but the union of the two. As, therefore, the earth is constantly evolving ammonia into the atmosphere, which again descends upon it with the dews and rain, common salt should, in an equal proportion, be strewed upon the land, that alkali soda may be produced by the union of both.

The foregoing observations will, to a certain extent, elucidate the origin, and account for the great effect produced, by introducing, and in effect such satisfactory results (sulphate of soda, or Glauber salts, sulphate of magnesia, Epsom salts, nitrate of soda, nitric or neutral salt, composed of soda and nitric acid.) Its virtues are similar to nitrate of potass, and for which it may be safely substituted; all of which are generally introduced in the present new mode of management, and when judiciously applied, gives full one-third increase, at one-third less cost, to crops generally.

I am induced to offer the remarks on common salt from the present unprecedented low price of the article; it is within the reach of the poorest farmer or labourer of the United Kingdom, and well worth their adoption as a manure generally. Agricultural salt is to be bought at the works, to a limited extent, 4s. 6d. per ton; and the common rough salt, fit for domestic purposes, at 7s. per ton. The latter, I consider, greatly the cheapest, and can be had in any quantity; while the other is only to be obtained to a very limited extent, and which merely consists of the refuse and sweepings of the works (half dirt, nearly); and as the freight or carriage is the most serious expense, the common salt would prove the cheapest, being pure salt, and, if required to be reduced, could be performed in the field where it is intended to be applied. In giving these hints upon the value of salt, it is no less important than true. Salt has risen 1s. per ton within these few weeks, and if an export takes place for the East Indies (not at all unlikely,) it may go up several shillings per ton, and then unprecedentedly low. Therfore I hold it good for agriculturists to lay in a stock at the present time. I beg to add, in giving these hints, I am in no way interested in the sale of salt, and it is from a pure motive that I offer the foregoing remarks; and I remain, Sir, yours respectfully,

J. H. Sheppard.

CHEMISTRY FOR FARMERS.

BY JOHN SPROULE.

Author of a "Treatise on Agriculture," and of Prize Essays on "Flax," "Manures," &c.

I. Preliminary Observations.

Practice with Science is the appropriate motto of the Royal Agricultural Society of England; indeed, peculiarly appropriate, inasmuch as the various operations to be performed in the cultivation of the soil are more dependent on the aid of science than those of any of the other arts. This country is justly famous throughout the world for the comparative perfection which has been attained in the various arts and manufactures in which its inhabitants are engaged; but it is to the successful investigation of science, as connected with them, that the fame hitherto acquired has been attained. It is not necessary in this place to enter into detail in exhibiting examples of the beneficial application of science to the arts, as these, to a certain extent, are familiar to every one. The application of science to agriculture, though it may be less apparent, is not less essential, even in those departments which may be regarded as of minor importance. The rudest implement used in the cultivation of our fields is not constructed without an intimate knowledge of mechanics; and although in this age of division of labour, the person who uses the implement is seldom or never the manufacturer, still a knowledge of the principles on which it is constructed is of much importance, as often enabling it to be used more effectively and economically; and this knowledge is especially necessary in the event of its going out of order. In the manufacture of the usual farm implements science has indeed already done much towards bringing them to their present highly improved state. To the uninitiated many of the implements and machines now employed in agriculture might seem more as objects suggested by the fancy of the machinist, than as examples of mechanical skill admirably adapted for the intended purpose; but the scientific farmer looks upon them in a very different light. As new implements and machines are being manufactured every day, it cannot be expected but that even the most intelligent farmer may be unacquainted with some of them; but from his practical knowledge of the operations which they are intended to perform, and the knowledge which he *should* possess of the principles of mechanical science, he will be able at once to form an opinion as to the value of any new invention. The want of this knowledge on the part of the farmer is often a serious drawback on his operations, as depriving him of the aid of many valuable implements, of which he is unable to appreciate the value without having seen them at work; while, on the other hand, a practical knowledge of the usual operations of husbandry, at least to a certain extent, would be eminently serviceable to the manufacturer, as enabling him better to adapt his implements and machines to the intended purpose.

This species of scientific knowledge may be regarded as of primary importance. It, in fact, forms the foundation upon which the entire superstructure of agricultural education is to be erected. Geology afterwards steps

in to render its assistance in making the husbandman acquainted with the nature and disposition of the various strata forming the outer covering or surface of the earth —the scene of his labours. By the aid of this department of science the origin of the several soils is explained, with the cause of the diversities which, even in the same field, they occasionally exhibit. The nature and origin of subsoils are also ascertained by the same means, with the advantages which may be expected from breaking them up, and to what extent they should be brought up and incorporated with the surface soil. Geology is further, of essential service in the important operation of draining. It points out the stratification and arrangement of the soil and subsoil, attention to which is often of incalculable advantage. By the aid of this science, moreover, the quality of the soil for agricultural purposes is determined with considerable precision. The primary ingredients of all soils being the result of the gradual disintegration of the rocks on which they are recumbent, it follows that a knowledge of the constitution of the rocky substratum is the first step towards forming a correct opinion of the quality of the soil itself. Thus the soils of limestone districts are uniformly fertile, whereas where granite forms the substratum they are generally barren.

The determination of the precise ingredients of the soil belongs to chemistry; but there are many variations in the qualities of apparently similarly constituted soils, which geology unassisted can explain. In conducting a geological examination of an extensive estate in Yorkshire, the result clearly demonstrated that the value of each field corresponded to the variations of the strata, and were limited by the areas which these occupied on the surface; thus showing that the geological character of a country, when accurately understood, pointed out at once the natural value of the land, and the system of cultivation best adapted to it. For instance, on the highest range of hills on the estate in question, a few fields, without any apparent reason, have been universally productive in all seasons, more so than the fields adjoining them on a lower level, and which appeared nearly of the same quality, the cause of which was found to proceed from the circumstance of the substratum being formed of calcareous grit. This examination also showed that the wheat is usually thrown out in severe frosts only upon those fields formed by the coralline oolite; the same cause having no effect upon the adjoining fields, which are on a different stratum. A limestone road lifts more in frost than a gravel road; and a different method of planting wheat upon chalk or other calcareous soils is to be pursued from that adopted in other cases, to guard against failure from this particular cause.*

Geology has relation to the soil itself, and modifies the operations which are performed with it. The next consideration, then, is the plants which are to be grown on it The science of botany imparts a knowledge of these, and is a proper object of study with every farmer who is anxious to rise above the empirical practice of his art. The term is of course understood here in its most extended sense, and not merely in the limited signification of classification and arrangement, to which it is too often confined. The art of culture is well known to modify the characters of plants to an almost incredible extent; in fact, to such a degree that the original characters can scarcely be traced unless by the practised eye of the botanist. The mere practical farmer could scarcely be convinced that the insignificant wild cabbage is the original whence we have derived the numerous varieties in cultivation; and the characters of some of these are even so different that it can scarcely be believed that they have a common origin. Thus the cauliflower is not more unlike the drumhead and thousand-headed cabbage, than both are unlike the wild plant to which the originally owned their origin; the peculiar properties of each being produced by art. Nor is the wild carrot less unlike the numerous valuable varieties of that plant in cultivation in our fields and gardens. The sour crab is the original from which different varieties in our gardens have been obtained. But it is unnessary to enumerate further examples of the great influence which cultivation can be brought to exercise, in changing the qualities of the natural products of the soil. These changes can, however, only be brought about by properly understanding the structure and functions of the vegetable economy, as it is only when our operations are in consonance with the great laws of nature, that they can be expected to be successful. Many of our cultivated plants are exotics, now become naturalized to the vicissitudes of our climate; while others must be kept entirely in an artificial atmosphere, the temperature of which is assimilated as closely as possible to that of their native places.

But a knowledge of the science of plants, if the term be allowed, not only enables the cultivator to improve the quality of existing varieties; it also enables him to produce new ones, or hybrids, possessing in some degree the characters of each of the original plants from which they were derived. The beautiful organization by which the continuation of the species is secured, cannot fail to call forth the admiration of even the most casual observer. In the vegetable kingdom the sexual organs are not less perfectly developed than in the animal, impregnation of the ovary being not less essential for the purposes of reproduction in the former than in the latter. Abundant arrangemets naturally exist to secure this process taking place without the intervention of art; but when a new or hybrid variety is desired, it is merely necessary to bring the plants from which it is to be produced into contact at the proper period, depriving the one of the male, and the other of the female organs, and securing the plants thus situated from the possibility of contact with others of the same family. This process is managed with great facility in the case of the Brassica tribe of plants, and a very valuable turnip in general cultivation—Dale's Hybrid—was in this manner originally produced.

The consideration of the development of the vegetable structure properly belongs to that department of botany termed vegetable physiology; but it is to chemistry that we are indebted for our knowledge of the means by which the necessary changes for that purpose are effected, with the various decompositions and combinations thereby produced. Chemistry not only determines the precise ingredients composing the structure of plants, but also those of the various other bodies by which they are influenced. The vegetable physiologist ascertains the means by which plants increase in size, the flow of a peculiar liquid termed the sap at particular periods of the year, the functions performed by the leaves in changing the properties of this liquid, and the peculiar organs which serve as channels for its conveyance, with the various other phenomena of the vegetable growth; but the chemist determines the composition of this liquid both before and after the leaves have exercised their influence, and endeavours to ascertain the sources whence the various ingredients found in plants are derived. These are in part supplied by the atmosphere and by water, and in part by the soil. No other source exists from which plants can derive anything for their support. The composition of water and of the atmosphere being constant, the supply from these sources is unfailling; and when the necessary ingredients are not found to exist in the soil they must be supplied by artificial means; hence the origin of manuring exhausted lands, and the importance of chemistry applied to agriculture as determining how this can be best effected.

The determination of the sources whence the various ingredients of the vegetable structure are derived, solves one of the most important problems connected with the culture of plants. This is, however, no easy matter satisfactorily to ascertain. So far as regards the mineral constituents of plants, no doubt can of course be entertained as to their being supplied by the soil alone. The recent researches of scientific men have done much to remove the doubts with which our previous knowledge of the subject was surrounded; and from the manner in which these investigations are at present conducted, there is good reason to hope that all doubts upon this important subject will speedily be removed.

* Journal of the Royal English Agricultural Society, vol. i. p. 270.

Chemistry further shows us the intimate connexion subsisting between the animal and vegetable *kingdom*—how organized matter is produced from the soil, water, and the atmosphere—how this organized or vegetable matter is destined for the support of a still more highly organized existence, in the form of the various animals which all originally derive their food from plants, the herbivorous affording food to the carnivorous. Though apparently so dissimilar in their constitution, analysis shows animals and vegetables to be precisely identical in this respect, each being resolvable into a few primary elements, existing merely in different proportions and in different states of combination. However different the bones of animals, which, under certain conditions, almost bid defiance to the ravages of time, may appear from the blade of grass or a grain of corn, precisely similar ingredients will be found in the one as in the other; the animal organism being incapable of forming within itself any new elementary matter not originally taken into the system by the food. It is to chemistry also that we are indebted for a knowledge of the changes which take place in organized matter during its growth; how, in the animal enconomy, one proportion of the food is devoted to the production of muscle, and another of fat, as well as the peculiar circumstance under which this is, with the greatest facility, produced.

(To be continued.)

ATMOSPHERIC ELECTRICITY AS A PROMOTER OF VEGETATION.

It will be in the recollection of some of our readers, that in October last, Mr. Gorton, of Nash-House, announced to the Tring Agricultural Association, the then immature results, or rather prospects, of some experiment which had been instituted by Mr. Forster, of Findrassie, near Elgin, on the application of Atmospheric Electricity to the promotion of the growth of plants; those prospects (promising as they then were) have since more than realized the expectations then formed, inasmuch as Mr. Forster has threshed, weighed, and measured, fifteen bushels of Chevalier barley, fifty-four pounds and a quarter to the bushel, from an electric area of twenty-three perches of land only, being at the rate of upwards of one hundred and four bushels to the acre, with *more than three times* the weight of the ordinary quantity of straw. The barley outside the insulated area, and therefore not within the influence of the artificially excited electricity, did not exceed a good average crop in either grain or straw. These facts will almost electrify some of our agricultural friends, and no doubt occasion distrust or suspicion in the minds of others, as to the correctness of the data and other accompanying circumstances. Our informant has inquired carefully into them, and has at present no reason whatever to question their accuracy. Mr. Forster, it will be seen, even prematurely announced his discovery in the most frank and disinterested manner; and, if he has stated anything incorrectly, he is open to contradiction from hundreds of his neighbours who watched the barley from the seed time to the harvest.

The idea of electricity as applied to vegetation is by no means new; and Mr. Forster does not arrogate to himself anything of the kind. The process, however, by which he has adapted it, is perfectly original, and obviously the result of good theoretical reasoning, and of legitimate induction from previously ascertained and well-established facts. We may add, that with the knowledge of those facts, it comes strongly recommended to us by its simplicity.

Mr. Forster first defines, or incloses as it were, a given area of land, in the form of a parallelogram, to be experimented on (say a quarter of an acre, or about fifty-five yards by twenty-two) with common iron wire, of four-pence to the pound, which is buried in the ground at a depth of from two to three inches, and fastened at the corners by dry wooden pins. In the centre of this inclosed area he erects two stout poles of dry pine or fir wood, fifteen feet above the surface of the ground, and forty-five yards apart, and placed magnetically north and south. Over the tops of these poles a stouter iron wire is extended, and descends from them at either extremity, like the fore stay of the mast of a ship, and is fastened to the ground by a strong dry wooden hooked stake, and, of course, in immediate communication with the buried wire. The cost of this apparatus, including labour, is only five shillings, and would be considerably less, in proportion, if applied to a greater extent.

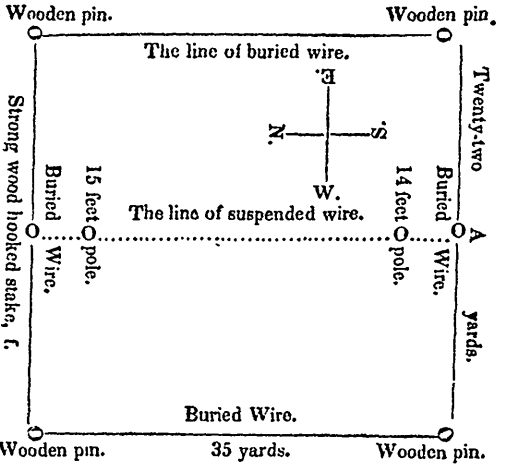
He thus establishes an insulated electric area, and having determined the principle, the extended application of it, modified according to circumstances, becomes simply a question of degree.

One of the most interesting results which have come to our knowledge is, that barley under the central suspended wire, grew higher and more vigorous than the rest, as if every beard and blade of corn strove to attain the source of the arrested element.

In September last, Mr. Stevens, an artist of Elgin, stated to Mr. Gordon, that he had seen barley growing at Mr. Forster's, of Firdrassie, under the influence of atmospheric electricity, as strong and luxuriant as if it had been sown on a dunghill. Mr. Gordon having ascertained its correctness, seized upon the fact; and, with the hope of seconding the disinterested views of Mr. Forster, and making them more extensively known, liberally offered to give a prize of thirty pounds (through the Council of the Royal Agricultural Society) for the best Essay on Electro-culture. For reasons hitherto unexplained the offer was declined.—*Bristol Mirror.*

CULTIVATION OF CORN BY ELECTRICITY.

The application of the free electricity of the atmosphere to the growth of corn is beginning to excite very general interest, in consequence of the successful experiments made by Dr. Forster, of Findrassie, near Elgin, who produced 104 bushels of Chevalier barley, from a single acre, by this novel mode of culture. The cost of the electric apparatus is 1*l.* per acre, and it will last for 20 years. The following is the plan upon which it is arranged on a quarter of an acre of ground :—



The cost of the above would be—for 6lbs. of iron wire, at 4d. per lb. (for burying) 2s.; 4lbs. of ditto, at 3d. per lb. (for suspension), 1s.; two poles of dry wood, 1s.; labour, &c., 1s.; total, 5s. As the area increases, the cost diminishes. Convenient and desirable areas are, for two acres, 127 by 75 yards; one acre, 80 by 55; three quarters of an acre, 82½ by 44; half an acre, 73 ½d by 33; quarter of an acre, 55 by 22; one-eighth of an acre, 36 by 16 ½d. The mode in which the plot is laid out is as follows :—With a mariner's compass and measured lengths of common string, lay out the places for the wooden pins, to which the *buried* wire is attached (by passing through a small staple), Care must be taken to lay the length of the buried wire due north and south by

compass, and the breadth due east an west. *This wire must be placed from two to three inches deep* in the soil. The lines of the buried wire are then completed. The *suspended* wire must be attached and in contact with the buried wires at both of its ends A wooden pin with a staple must therefore be driven in at A, and the two poles (one 14 feet and the other 15 feet) being placed by the compass due north and south, the wire is placed over them, and fastened to the wooden stake, but touching likewise at this point the buried wire. The suspended wire must not be drawn too tight, otherwise the wind will break it.

The Canadian Agricultural Journal.

MONTREAL, MAY 1, 1845.

AGRICULTURAL REPORT FOR APRIL.

We have not seen a more backward spring sowing time than the present, during our residence in Canada. There is up to this time, scarcely any work done in the fields. When the land is in a fit state for working, every physical exertion, both of man and horse, will be required to get the seed into the ground in proper time, before it will be too late. In such seasons as the present, the want of sufficient draining is most clearly seen. When the sowing is retarded in spring, the fall ploughed land. if not of open quality or well drained, requires to be ploughed again to fit it for a crop. We believe, however, that a large portion of the land intended for spring sowing has yet to be ploughed, in consequence of the winter commencing so early (the 28th of October) last fall, that ploughing was suspended nearly a month before the usual time. If the weather now sets in fine, we may yet be able to complete the sowing and ploughing in reasonable time, as wheat may, perhaps, be more safely sown the latter end of May, when not sown before now. We have abundance of wheat for seed, that will succeed with late sowing, not being very liable to the disease of rust, and not coming into ear until the danger of the fly is nearly over. A change of seed is very essential. When the same seed is sown upon the same ground for a series of years, it seldom fails to exhibit all the characteristics of weakness and degeneracy, and falls off in both quantity and quality. Wheat should be changed annually, and the farmer will always find it his interest to purchase that from a different or worse soil than he proposes to sow it in, provided the wheat is of the variety required—clean, without any mixture; it is not of much consequence that the grain should be small, as this may proceed from causes that will not injure it as seed for a future crop. The grand requisite, is to have the soil in good order. In cattle as well as plants, changing from a better soil to an inferior, is sure not to be profitable. On the contrary, when the breed or seed is of the proper sort, each should be chosen from soils and situations, not superior to that to which they are brought. For late and elevated districts, the early varieties of oats should be selected and brought from an earlier and less elevated locality. And a change from a high to a lowland district seldom disappoints expectation, with either oats, barley or potatoes. When the ground is in high condition the less seed is required, and *vice versa*. But no general rule can be laid down, for it is sometimes requisite for the sower to change his hand two or three times in one field. The quantity of seed generally sown in England, is about three bushels to the statute acre. But we conceive that in Canada, two *minots* is generally sufficient for the arpent, if the oats is good and sound, and the land in good condition: and the same quantity of barley will answer. Vetches or tares, when intended to be fed out to stock in summer in a green state, might be sown at two or three intervals of fourteen days, so that they may come in in succession, green and in the best state for feeding. In England, the quantity of seed sown to the acre, is from 100 lbs. to 112 lbs., but we think a less quantity would do here. Some ground is very greedy for seed; and the farmer's own experience in reference to thick or thin sowing upon his own farm should be a better guide to him than anything which can be wrtten upon the subject. This applies to every species of seed sown by the farmer.

When vetches are intended for the feeding of cows, it is advisable to sow about a quarter of a pound of feeding rape with every stone of vetches. We have heard that this plan is eminently calculated to promote the secretion of milk in cows, while, on the other hand, it is said that vetches alone have a tendency to cause cows to fall off in milk but to improve their condition in a high degree. Vetches can be covered with the harrow.

Clovers and grasses should never be sown on ground which is not both rich and clean, always with the *first grain crop after manure*,

In the covering of oats a liberal application of the harrow is very essential; and when the furrows are open, and yawning, a single turn of the harrow prior to the seed being sown is highly necessary, otherwise the seed can never be covered at a uniform depth, and the deep buried grain protrudes through the surface like after shots. When the seeds of clover and grasses are to be sown at the same time with oats or barley, the grain should be sufficiently covered before the small seeds are sown, then one turn of a bush harrow will give ample covering to the clovers and grasses; when too deeply covered few of the seeds vegetate.—Clover need not be sown upon deep moor, bog or wet ground except the bog or moor has been drained and highly top dressed with some earthy material, or with a good dose of lime.

We would recommend, by all means, that potatoes should be planted as early as possible, as the best means for the prevention of disease. Notwithstanding all we have seen published on the subject of the rot in potatoes last year, previous to their being taken up, we are still of the same opinion as we published at the time the rot was discovered, namely, that it was occasioned by the peculiar state of the crop in the latter end of August, being then in an extremely luxurient and soft state of growth. The weather exceedingly moist and warm, produced too great a degree of heat in the manure and soil which surrounded the young potatoes in their soft state, and hence caused disease. We have not seen any other reasonable cause assigned. The use of charcoal and lime, we are satisfied would be beneficial, and we would further suggest, the expediency of planting in newly broken up land, and not to apply too large a quantity of manure in the drills, but rather to mix it through all the soil. We have often recommended the ploughing in manure in soil intended for potatoes, the fall previous if possible; but even in the spring the manure might be applied in this manner, if short and not containing much unrotted straw.

Cote St. Paul, April 28, 1845.

THOUGHTS ON AGRICULTURE.

We copy the following article from the *Mark Lane Express*, making such alterations as we find necessary, to suit it for Canada:—

That the bad state of cultivation and the defective system of husbandry generally in Canada, arises from two causes—want of knowledge and deficiency of capital. That there is not at present any thing near a sufficiency of capital employed in agriculture to farm the land properly *and to the best advantage* That capital has not and will not flow into agricultural channels whilst farming is so commonly an unprofitable occupation.

That it has been unprofitable hitherto from *unequal competition with foreign produce*, restrictions on our trade with the Mother country, (now fortunately removed) from want of knowledge, and from deficiency of capital: all combined and acting most unfavourably. That were the necessary capital forthcoming, there is not, amongst farmers generally, a sufficient agricultural information to apply such increased capital profitably.

That to employ even the present capital to the greatest advantage, the quantity of land kept in tillage should be diminished in extent nearly one-half, and the labour and cultivation of the part kept in tillage doubled.

That there exists amongst farmers generally, an unprofitable desire for large buildings, with a small employment of labour, capital and implements. That the generallity of farmers consider from £2 to £3 per acre, a sufficient investment, whereas, double that sum is scarcely an adequate profitable capital, affording the means of effective cultivation.

That the remedy for these evils is the communication of agricultural knowledge to farmers.

That this knowledge will be best promoted and diffused by agricultural schools or colleges, with farms attached, on the principle of that excellent one now establishing at Cirencester, England.

That there should be one or more such establishments in every county in the Province.

That there should be agricultural endowed colleges of the first order under authority, where students should qualify by superior practical and theoretic knowledge, passing their examinations and obtaining their agricultural diplomas the same as in law or medicine.

That such qualified individuals would thus spread over the country agricultural schools and farms, advantageous alike to themselves and to the rising generation of farmers, who would imbibe sound theoretical and practical instruction.

That such instruction would render farming a more uniform, more profitable, and more gentlemanly occupation.

That in consequence capital would more rea-

dily be attracted to farming purposes in ample amounts, the character of our farmers raised, the strength of our country increased, and ample provision made for years to come, for the employment of our increasing population and capital.

That if knowledge is power, ignorance must be weakness, individually and nationally.

That increased knowledge, capital and profit in our farmeries must enhance the value of landed property, increase the comfort and intelligence of the farmers, and labourer, and have a beneficial influence on trade, commerce, and manufactures —for we are all links in one great chain, depending on each other for support.

Any individual thoroughly acquainted with the state of agriculture in Canada, will be convinced of the justice of the above remarks, so far at least as refers to the causes of its depression.—The remedies suggested may, perhaps, not be considered the best that could be adopted, but they are, however, entitled to consideration.

From our boyhood we have been brought up to farming; and from early life we have been taught that agriculture was the first, most honorable, and necessary occupation for man. This opinion has been confirmed by all we have read of the best authors, and by our own observations of what we have seen of the world. It is from these convictions that we have observed with astonishment the little regard that is paid to this first of all occupations in Canada, as it must be to her for ages yet to come. If there is any country on earth in which agriculture is of paramount interest, it ought to be so in Canada. Without hesitation, we say, that the general prosperity of the country MUST altogether depend upon the prosperous condition of her agriculture. Sections and classes may have temporary success, from accidental circumstances, we shall not at present enumerate; but there cannot be any permanent and general prosperity secured to this country, while her agriculture is neglected, and not in an improving and prosperous condition. This fact will be confirmed at no very distant period.

AGRICULTURAL SOCIETIES.

The new law for the regulation of Agricultural Societies, comes into operation in the month of June, or rather, we should say, that where County Societies are not yet formed, the new law provides for their organization in the month of June. The County of Montreal has no County Society; and as there is no provision in the new law for continuing District Societies, there must be a County Society organized, in order to entitle them to receive any of the public money. We believe that Friday, the 27th of June, is fixed upon as the day for a meeting to take place at the Court House, for the organization of a County Society, and we recommend a full attendance of all who wish such Societies to produce the general benefit to the country, for which public money is granted to them. It is not for those farmers who profess that they cannot receive any further instruction in the art of agriculture, that these Societies are instituted, but in order that instruction and encouragement may be offered to farmers who do not understand the best modes of cultivation and management in every branch of husbandry. It is not necessary to instruct or encourage any man who understands his business properly. He will know that the most judicious and proper modes of cultivation and management should be the most profitable, or it would be folly to encourage others to adopt a good system. The new law certainly goes far to provide the means of encouraging the improvement of Canadian agriculture; and if those who are appointed to manage new Societies, do all that might be possible to do under this new law, we shall soon see its good effects—but all will depend upon this. We shall in our next number endeavour to copy the last Agricultural Act, and should the new Society be organised in the intervening time, we trust it will be in the true spirit and meaning of the new law. All persons subscribing one dollar towards the funds of the new Society, shall be entitled to vote.

The following article on the soiling of milch cows in summer, is deserving of consideration. When the farm is not extensive, and all in good cultivation, we have no doubt it would be profitable to soil a few milch cows; but in Canada where generally a part of each farm is only fit for pasturage, if it was not pastured, it would be waste. On a small farm, well cultivated, a few cows would be soiled with advantage, and at a less cost, perhaps, than by pasturing. The farmer, however, will be best capable of deciding

what will be most suitable in his own particular circumstances, and we need not offer any further observations on the subject :—

To the Editor of the Canadian Agricultural Journal.

April 23rd, 1845.

Sir,—As you have invited correspondence from us habitans, I have ventured to trouble you, in order to obtain information on the following subject :—As my pasturage this year will be indifferent for my cattle, I proposed sowing vetches, so as to be able to soil the milch cows during the two warmest months of summer. Which is the sort of soil most adapted, and best mode of cultivating tares or vetches in this country, the quantity of seed required per acre, and when would it be likely to be ready for cutting? Or is there any other green fodder, the seed of which could be obtained in Montreal, that would answer as well or better? It must be borne in mind, that as it is for immediate use, clover, lucerne, &c., which would only be available next season, would not answer; rape, I fear, would be liable to the attacks of the fly. By supplying the required information, with any data you may consider necessary, you will oblige your obedient servant, &c.

—.

In reply to our respected correspondent, we conceive that vetches, or tares, would be the best plant that could be cultivated for the purpose required, under the circumstances. They should, however, be sown immediately, and on soil of sufficient fertility to bring them forward rapidly, so that they would be fit to cut the latter end of July, or beginning of August, when pastures begin to fail here. Vetches will grow on almost any quality of soil, and we have seen heavy crops produced on soils too poor to yield any other crop. As in this particular case, that the vetches would be required for soiling milch cows, when pasture begins to fail, it would be prudent to sow the vetches on good soil, well ploughed, and the seed harrowed in. One bushel and a quarter, or one bushel and a half, perhaps, to the acre, of seed is required. A small quantity of oats or rye sown with the vetches is a good plan, as it helps to support them. An acre of vetches is said to produce in England twelve tons of green food. We have given a full description of the mode of cultivation, produce, &c., in our "Treatise on Agriculture," p. 190 and 191, and we can supply a copy to any one requiring it. Rye has been recommended for soiling cattle in summer, to be cut green, and it is said to answer extremely well, and give two or three cuttings, but we would prefer vetches. Lucerne might be cultivated this year, to cut next year for soiling cattle. It is very early and productive, and would succeed well in Canada. Rape is liable to injury by the fly, and we do not think it would be the most suitable food for soiling cows. We never have made use of it, except for feeding cattle for the shambles. Cattle will not thrive on any other food after they have been fed on rape. We shall at all times be most happy to give any information in our power to correspondents and subscribers. We publish the Journal with a view of advancing agricultural improvement, and we are most anxious to circulate any useful information that is in our power. We have every opportunity of obtaining the latest reports of improvements and experiments in the art of agriculture, as at present practised in the British Isles, and in other countries. And our subscribers may be assured we shall make such selections as we conceive most useful.

We have before us the first number of "*The British American Journal of Medical and Physical Science*," edited by A. Hall, M. D., of Montreal, and so far as we are capable of estimating its contents, we think most favourably of it, as highly creditable to the Editor, and to the Province, and heartily wish it well supported, and complete success, as we have no doubt it will deserve to be. Dr. Hall, as Lecturer of Chemistry at the McGill College, and one of the Physicians at Montreal General Hospital, will have the very best means at his disposal for filling up his journal with the most useful and interesting matter, and he will also have ample resources to select from. We expect that every succeeding number of this journal will become more useful and interesting. To ensure its being so, however, let it be properly supported, and this will give encouragement and confidence to the editor, which it is almost impossible to possess when a publication is not sufficiently supported. Subscribers are necessary to insure the usefulness and success of any publication.

In a former number of this Journal, we noticed Hall's Patent Machine for extracting small roots of trees and brush, and also the larger sort of

weeds and thistles, on sale at Mr. Hearle's Store Notre Dame Street, nearly opposite the Recollect Church. This implement received the premium of the Royal English Agricultural Society, at their annual show of implements. We can recommend it as a most useful implement on a farm; and as they are of different sizes, the smaller size will be found most effective in pulling up large weeds and thistles. The larger size might be improved by increasing the length of that part upon which the instrument rests in extracting roots of trees; but this is easy done, and would give a more powerful prize to pull out the roots of brush and small trees. It is saying very little for our farmers, that these implements should be allowed to remain on the hands of the importer. It is very bad encouragement to import agricultural implements of the best and most improved description, which are so much required in Canada.

We copy the following article on agricultural education in Scotland, and we trust that something may be done in Canada, also, to give an agricultural education. We have colleges endowed from public lands and funds, for the instruction of youth for every profession except that of agriculture, as if that was of less consequence than any other, to the country generally. It is astonishing how few of our men of influence or education, appear to comprehend the vast importance of a prosperous agriculture to Canada—indeed they do not seem to regard it as of the slightest importance. Every other profession is considered to require an education to fit men for exercising their advantages, but, agriculture on the contrary is regarded as a degrading profession requiring no education, and only a fit occupation for persons who, would be unable to fill any other. If there was any other means to insure the prosperity of this country except by the abundance and excellence of the produce of her soil, it would not be surprising that the educated and influential classes of the community should devote their principle attention to promote the interests of the class to which they belong or may be connected with, but as the general prosperity is impossible, while our agriculture is not in an improving and prosperous condition, we say that it is a great discredit to the country, that every measure possible to be adopted, that would be likely to produce the improving and prosperous condition of agriculture should not at once be put in active operation. We now repeat, what we have so often said before, that however others may regard our agriculture, it is of infinitely more importance to the people of Canada, than any other business or profession; and further, than all other business and professions put together. Let the people judge then whether it has received the degree of attention to which it was entitled by its vast and paramount importance.

AGRICULTURAL EDUCATION.

On Tuesday week, a meeting of the Committee for promoting agricultural education in Scotland was held in Douglas's Hotel, Edinburgh. There was a full attendance. Mr. Fleming, Barrochan, was called to the chair. The proceedings showed that a good deal of interest is taken throughout Scotland, among our heritors, farmers, and schoolmasters, in this important cause. Various letters from teachers on the subject were read at the meeting; among others, the following from Mr. Rosss of Glenluce.

Glenluce, Jan. 10, 1845.

"Sir,—It is eight months and upwards since I formed a class for the study of this science in Glenluce, during which time my pupils have increased from seven to twenty—all of them farmers sons in Old Luce and the neighbouring parishes.

"Three hours each week have been devoted to explain the principal questions in Professor Johnston's Catechism. I first give a lecture on a certain subject, such as draining, manuring &c.; and when the class is next assembled, I desire the young men to answer my questions on said subject in words of *their own*, in order to ascertain whether they thoroughly understood the subject matter of discourse. By these means, you will perceive, they have time sufficient not only to improve by the lecture, but also to prepare answers, which are often astonishing, considering their years. Such is the interest that teacher and taught take in this science, that it would be difficult to determine which has it most at heart.

"I have received liberal support from the several heritors of Old Luce, to whom I have applied for means to purchase books and apparatus; indeed, I am encourged to persevere not only by the help of the heritors, but likewise by many worthy and distinguished farmers in the neighbourhood.

I am, &c.,

(Signed) "John Ross."

A most destructive distemper is at present raging amongst the cattle in several countries of Europe, particularly Zealand. It appears that no cure has yet been discovered for it. The following articles respecting it, we copy from the *Mark-Lane-Express*.

Pleuro-Pneumonia.—This treatise has been already forwarded to your Government by the English Consulate; but, being written in Dutch, is probably not understood not being translated. If its translation could be ordered by your National Agricultural Society, it would give a more general knowledge of the character of this disease, and would open a dreadful prospect of its consequences. were it once to gain a seat in the blood of your immense and valuable stocks of cattle. There is no doubt, if no effectual measures are taken by your Government, your cattle markets will soon bring this distress all over the country. The only way of preservation against this infection is, not only to kill every head of cattle attacked by this disease, but likewise every other, though apparently in a healthy

state, which has grazed, or been in the same stall with an infected animal. In this, our province of Zealand, this method has been adopted; and I have witnessed eighteen instances of this distemper, against which, in the full conviction that no other remedy could have a chance of success, I proposed to Government, in my quality as President of the Provincial Board of Agriculture, to kill at once all the cattle existing on any farm where this disease had broken out—the value of the said cattle to be reimbursed by Government to the owner, after valuations ordered beforehand. This having been granted, I have had the satisfaction, by the execution of this very severe measure, of preserving till this day, this part of the country from those immense losses which have been experienced in other provinces. It has been very remarkable that, in every instance, the origin of the distemper lay in infection by other cattle brought over from Holland; by which it has been fully proved that the cause must not be attributed to any atmospheric or other influence at home, but wholly to infection. The few instances of recovery are always partial; the virus of the infection is never extinguished, for the power of its influence on other cattle continues, though the animal itself should become fit for the butcher. When we consider this distemper in its various periods, together with the results of *post mortem* examinations, the conviction is inevitable that the lungs, which are grown to an immense fleshy volume, can never be brought back again to their former natural state, and consequently that no cure is possible. I hope you will consider this communication as having no other aim than to make you acquainted with the dreadful consequences which must take place when a proper line of conduct is not prescribed; for, if owners of cattle should rely on the promises of verterinary surgeons, who should give hope of a cure, they will be in a false position, the contagion will gain ground every day, and when it shall become more general, it will be beyond human ability to put a stop to it.—*C. Vis, Middelburg, President of the Board of Agriculture, Province of Zealand, Holland.*

The Swedish Government has made a communication to the Royal English Agricultural Society on the subject of the Epidemic now raging amongst cattle in several countries of Europe. The report is too long to copy, but we give the following remarks of Professor Sewell made before the Society.

Professor Sewell remarked that the cause of epidemics in any form or in any country attacking animals in the first instance proceeded from malarious emanations from the ground on which they gathered their food and on which they slept—that at such time it was inhaled undiluted with common atmospheric air, and was also received by cutaneous absorption, especially during the night. He considered that the house stock were more affected by modifications of the symptoms, the disorder in some assuming the character of scarletina, typhus, and other fevers of the human species, the result of a combination of the gaseous exhalations from the lungs and skin of the animals, the fæces and urine, and the saturated state of the floors of the sheds or houses. It was found that low, damp situations were the most productive of these diseases, the vitiated atmosphere, being condensed and not so readily dispersed and diluted by currents of air and winds; and it was, therefore, advisable that immediate removal of the diseased animals should take place from the immediate spot, and if possible, to a drier situation; and that if rendered still more so by litter of any kind, the symptoms would be mitigated, and medical treatment more likely to avail. He also considered that a change of diet would be desirable, it being profitable that the vegetable food, especially that eaten in the early part of the morning, might retain the terrestrial exhalations, and thus also convey the miasma into the system. With respect to treatment, he had nothing to add to the remarks he had communicated to the members on a former occasion, excepting to recommend more urgently the closest examination of the stock, at least two or three times a day, and the immediate bleeding of the animals on the slightest indication of disease. He added that inflammatory action was so violent and rapid in its progress and so general in its attack, that disorganization of some of the most important vital organs speedily ensued; or effusion into the cavities of the chest, abdomen, or brain supervened, and rendered medical treatment then seldom available.

The following extract from the reported proceedings of the Trobus Farmers Club, may be interesting:—

On the call of the Chairman, Mr. Karkeek then delivered his lecture "On Rearing and Feeding the Farmer's Live Stock." It was based on those scientific principles of the production of fat and muscle, and of the chemical processes employed in animal nutrition, which the lecturer has already, in various forms ably brought before the public; and was largely illustrated by various statistical tables. The practical suggestions mainly insisted on, as arising in the course of the lecture, were with reference to the advantages of stall-feeding, soiling, and the steaming of vegetable food. Mr. Karkeek described the system of soiling adopted by Mr. Snell, of Wayton, in Landulph. That gentleman, it appears, has a shed with yard attached, the entire floor of which is covered, first with earth for about six inches deep, then with hedge-parings cut in the summer, and thatched for the express purpose of soiling: and on this is daily laid a layer of straw. Mr. Lowry, of Tregarton, in Gorran, instead of earth uses sand, which the lecturer considers preferable. The plan of stall-feeding, and of cooking food, as carried out fully by Colonel Scobell, and some other eminent agriculturists, was in fact but a more complete development of that principle which farmers acted on in cutting their hay and straw into chaff, in sclicing turnips, and bruising their oats and beans. All were but various means—differing in degree as to effectiveness, but alike in principle—of economising the labour of the animal to be fed; it being now an established axiom that the greater the labour to which the animal, as well in feeding as in any other employment, was subjected, the greater must be the supply of food to supply the tissues so exhausted.—The lecturer said he had witnessed, in many instances, the beneficial effects of feeding farm horses on steamed turnips; and although the animals perspired rather more freely than those fed on drier food, yet they maintained a good working condition, their coats were sleek, and they were less liable to disease. Farmers' horses were generally affected by acute indigestion, spasmodic cholic, and inflammation of the bowels. He did not know that he had ever met with many cases of such disease where the horses had been fed on steamed food. Mr. Karkeek strongly condemned the practice frequently observable in this country of keeping a larger quantity of stock than could be properly fed—keeping them in a half starved condition during the winter, and turning them out on waste pastures and commons in summer, selling them in *store* condition. The way to make the most profit, both in rearing and feeding, was by forcing on the stock as much as possible during the period of their growth, with food varied according to the seasons and other circumstances. Experience had proved that the health and comfort of animals were greatly promoted by *change* of diet; and there certainly was never anything gained by stinting, either in quantity or quality. There should never be any cessation in feeding of cattle; those that were alternately stuffed and starved were sure to prove unprofitable.

Some conversation followed on the proportional ingredients of the various vegetables as exhibited in the tables of Professor Johnston and others.

In reply to Mr. James, Mr. Karkeer stated he could not give the exact per centage of nutritious matter in Swedish turnips particularly, but turnips in general con-

tained little more than 11½ per cent. of the fat and muscle principles. In an acre of Swedes containing twenty tons, there were about 6,000lbs. of the fat-forming quality, 920lbs. of the muscle ditto, and 38,250 lbs. of water.

Mr Trethewy observed that there was a considerable difference between the fattening properties of beans and peas.

Mr. Karkeek replied that beans contained more muscle than any other food, and peas were next. In beans there were 28 per cent. of muscle, and 40 of fat; and in peas 21 of muscle, and 50 of fat. He believed a mixture of peas and barley to be one of the best kinds of food they could give to pigs.

Mr. Trethewy, looking to the amount of fatty matter assigned to beans (40 per cent.,) and to oat straw (35,) asked if it was not doubtful whether the difference in their nutritious properties was so small.

Mr. Karkeek replied he did not think so; he would find that of the muscle forming quality beans had 28 per cent., while oat straw had only 13: that made all the difference. It must be borne in mind that those calculations of the philosopher had all been made in the closet, and must be tested in the farmer's homestead.

Mr. Karkeek said it was too late in the season now, and besides it was too mild. The best season for trial would be a severely cold winter. Instead of burning his weeds and other vegetable refuse, Mr. Doble should carefully clean his hedges and preserve all for the cattle to tread upon. In burning one hundred pounds of oat straw only six pounds of saline matter were left, and from the same quantity of wheat straw only five pounds; whilst the remainder, consisting of oxygen, hydrogen, and carbon, escaped to the atmosphere. The carbon is what is called humus or decomposed vegetable matter, of which the richest land consists; and if burnt, it flies to the atmosphere, instead of being retained and gradually given off to the roots of plants.

Mr. Trethewy observed that the sheep fed in the open air, as stated in the table, consumed 1912 lbs., and gave a profit of 4s. 10d.; whilst those in close confinement consumed 886 lbs., and gave a profit of 10s. 8d.—thus consuming not half the food, and producing more than double the profit. That was extraordinary. If the calculation was accurate, he supposed the sheep would pay for the sheds.

EAST CUMBERLAND AGRICULTURAL SOCIETY.

At the late annual meeting and show of this society, Mr. Ellison, one of the judges of stock, gave the result of his experience in using bones and guano, with respect to the turnip crop. He had used four tons of guano this year, African and Peruvian, and from the appearances of the turnip crop, the African had answered as well as the Peruvian, although there was a wonderful difference in their price. He also had some turnips sown with bones, which were likely to yield about 23 per cent. less than those which had been sown with the guano. Now this was singular, after what he had heard a very respectable farmer state, that, on his farm, the only effect on grass was to make it a greener colour; and that, though it made corn greener for a while at first, it had no material effect upon the quantity produced. This soil was on a thin limestone bed; but he had tried it upon peat moss, and it acted equally well. With respect to the permanency of its effects, he could not yet ascertain it so well; and it was a known fact that bones were permanent in their effect. Corn from land which had been bone-manured would be stronger than from that produced by farm-yard manure. But, if they might believe a gentleman who had spoken at a meeting of the Royal Agricultural Society, the effect of guano was permanent; and therefore great benefit might be expected from its introduction. He would now say a few words with respect to potatoes. He had an agency in Lincashire in 11 townships, and had therefore had ample opportunities of observation; and he might say that potatoes there were a very failing crop indeed; and, in his opinion, it could be attributed to nothing but cutting the potatoes before planting them as seed. It was a common saying with many people whose potato crops had failed, that they had been carried off by the dry rot. But it was no such thing (?). He was satisfied it was an insect which penetrated through the potato when it was cut, and ate up all its juices, so that it was impossible the stem could flourish. He had examined potatoes in this way; and on taking them up, after being a fortnight or three weeks in the ground, the inside of the potato was found like a sponge, and perforated with small holes. He had this year six acres of potatoes, and they were all planted whole. He had also an acre in which the seed was cut, by way of satisfying his neighbours, and enabling them to judge of the difference of produce between the two modes. The six acres were as good as heart could wish for; while the acre in which the seed was cut was not half a crop. There was a tenant whom, three years ago, he threatened to turn off his farm if he continued to cut his potato-seed. He had seen him the other day; and he told him that it would have been £30 in his pocket, if he had followed his advice, as he had lost £30 a year by the old practice. A very effectual mode to prevent the worm amongst potatoes was to wash them. Experiments of this kind had been made; and those potatoes which had been washed, when laid up for seed, were found to be entirely exempt from this disease, which arose from the egg of an insect being deposited in the eye of the potato. By washing the potatoes in the autumn, the ova were of course washed out, and all danger obviated.

The Poultry-Yard.—The whole arrangement for the support of a moderate stock is very simple. The yard should, if possible, have an open exposure to the south, and be perfectly dry, as nothing is more injurious to all other than aquatic birds than stagnant water or moisture of any sort; and poultry suffer more from a wet winter, even if mild, than from one that is intensely cold, provided it be clear and dry. If the ground is wet, the foundation should be thoroughly drained, and the surface hardened, to render it sound, with a thick stratum of well-rammed bricklayers rubbish, or broken limestone mixed with small sandy gravel, over which pounded oyster-shells and egg-shells, or bones coarsely powdered, should be spread; but never paved with either flags or pantiles, as that would prevent the fowls from scratching the ground and picking up those calcareous matters, such as shells, pebbles, and bones, which—as will be hereafter explained—are necessary to their health and the formation of their eggs. It should likewise be sloped to carry off the rain; and it should contain an open covered shed for occasional shelter to the fowls, which, extraordinary as it may appear, seldom seek their night abode during the day, except for the purpose of laying. The shed is also requisite for the keeping of dry sand, small cinders, lime, and ashes, either in little heaps or pits, for the use of the common fowls in scouring their feathers from the lice to which they are subject; a process in which they not only delight by rolling themselves in the heaps, as in a sort of dry bath, but which is essential to their health in freeing them from those noxious vermin. If the shed covers the litter removed from the hog-stable, it will also be desirable; as the warmth which their crouching in it imparts to them is not only agreeable but healthful, and they likewise thus pick up many grains of corn which would be otherwise lost.—*Farming for Ladies.*

Effects of Training.—The state of health, or "condition," as it is termed, into which a man may be brought by training, is often extraordinary. This training it must be understood, consists in nothing more than regular exercise and living. The most salubrious and retired country places are usually chosen, and there the man, under the guidance of an experienced trainer, performs his systematic duties. He retires early to his bed, which is a mattress, with sufficient covering to ensure a suitable warmth, without encouraging unnecessary perspiration. He rises betimes in a morning, and after a general washing and rubbing, partakes of a slight repast, and commences his day's work by a quick walk of a few miles. He then returns home, and eats with what appetite he can. After

a short rest, he is again exercised until his next meal time, and so on throughout the day. His diet is chiefly confined to the lean of underdone beef and mutton, fowl, and stale bread. He takes two or three glasses of sherry, with, perhaps, a little old ale daily. The distance he is made to walk and run, every day, varies from ten to forty miles. He begins with what he is conveniently able to bear, and increases his exertions in proportion to his increasing strength. By these means, a man is shortly brought from a state of plethora and listless inactivity, to one of liveliness, energy, and endurance. Body and mind are alike invigorated and improved; but the benefit is mainly referable to the air and exercise. No training, however skilfully conducted, would bring a man into good condition who had to breathe an impure atmosphere.—*Medical Times.*

Guano.—Ichaboe, Jan. 21.—A large number of vessels are here unable to obtain any guano. The island is completely worked out.

Raising early Cucumbers.—H. G. Dickerson, of Wayne co., N. Y., adopts the following mode of raising early cucumbers. He makes his hot-bed at the usual time, and when the soil is placed upon the stack of manure, pieces of turf are placed just below the surface, on which the seeds are planted. If the grass of this turf is alive, it is to be put upside downwards. On the arrival of warm weather, and when the soil in the open air becomes fit for cultivation, these pieces of turf are removed entire, with the young plants upon them, and placed in highly manured ground where they are finally to grow. In this way, the roots are taken up without the least mutilation, consequently no check is given to their growth. Afterwards, whenever there is any probability of a night frost, each hill is covered with a bell glass. These glasses have a small opening at top, which prevents the sun scorching the plants in case the glasses are not removed in time. Where such glasses cannot be had, boxes with panes inserted, will answer nearly as well. By this means, cucumbers fit for the table, were raised the past season, by the first of June.—*Alb. Cult.*

Chinese Proverbs.—The greatest cowards are those who have most courage to do ill. The flatterer is only despised, whilst the calumniator is both hated and despised; nothwithstanding which, a hundred calumnies are sooner believed than one eulogium; and it is not even necessary for them to be probable. What is a man in office who has no merit? A dwarf in a giant's dress. Whoever wishes others to resemble him, should be like himself. Those who have nothing to do themselves, find most for others. The silliest person is not so foolish as he who measures his talents. He is rich who has nothing to lose. Till, nourish, sow, water, hoe your fields, and then pray for the harvest as if it were to fall from Heaven.

The sum of the Matter.—The sum of the matter, in all who diet for full strength, is, that they should make the sustainment, or prop, upon corn; they should temper with meat; they should exhilirate with wine; and they must have continued freedom of air to the lungs. The want of this latter important aid to natural dieting is the cause of great failure of health and strength in those whose occupations at the bar expose them to the confined air of the study-room, and the noxious atmosphere of crowded small courts of law.—*Parry on Diet.*

Preservation of Food.—Whilst, in former times during long voyages, mariners were confined to salt and smoked meats, which in the long run, always proved injurious to health, and thousands of human beings lost their lives for the want of fresh aliments, which were even more essential in sickness, these dangers and discomforts become more and more rare at the present day. This is certainly one of the most important contributions to the practical benefit of mankind ever made by science; and for this we are indebted to Guy Lussac. At Leith in the neighbourhood of Edinburgh, at Aberdeen, at Bordeaux, Marseilles, and in many parts of Germany, establishments of enormous magnitude exist, in which soup, vegetables, animal substances, and viands of every description, are prepared and sent to the greatest distances. The prepared aliments are enclosed in canisters of tinned iron plate, the covers are soldered air-tight, and the canisters exposed to the temperature of boiling water. When this degree of heat has penetrated to the centre of the contents, which it requires three or four hours to accomplish, the aliments have acquired a stability which one may almost say is eternal. When the canister is opened after the lapse of several years, the contents appear as if they were only recently enclosed. The colour, taste, and smell of the meat are completely unaltered. This valuable method of preparing food has been adopted by many persons in my neighbourhood and other parts of Germany, and has enabled our housewives to adorn their tables with green vegetables in the midst of winter, and with dishes at all times which otherwise could be obtained only at particular seasons. This method of preserving food will become of the greatest importance in provisioning fortresses, since the loss incurred in selling off old stores, and replacing them by new, especially with respect to meat, ham, &c., is far more considerable than the value of the tin canisters, which, moreover, may be repeatedly employed, after being carefully cleansed.—*Liebig's Letters on Chemistry.*

Milk and Butter in China.—During his late visit to Manchester, Sir Henry Pottinger stated that in China he had never been in the habit of seeing either milk or butter; but when the young Englishmen at Chusan were determined to have milk in their tea, they set some of the Chinese to work, and for the first milk they got paid a dollar. The consequence was that the Chinese set their wits to work, and began to keep cattle, and produce milk and butter; and now the civic service in China was supplied with some of the finest milk and butter that existed in the world. [We commend this statement to the consideration of those who have combated our proposition, that when a market is opened for an article, if the materials of production exist, they will be brought into active operation.]

Agricultural College.—The College about to be opened at Leopardstown, near Dublin, is situated on the south side of the city, and five miles distant from the Post-office. The farm consists of 200 Irish acres of land of medium quality. The terms for pupils in the Agricultural School will be £15 per annum, for which they will receive a suitable education; they will be engaged one-half of each day at farm-work, under the superintendence of the best practical and scientific agriculturist that can be obtained, and during the other half in the school, over which a teacher of like ability will preside. It is proposed, also, as soon as pupils shall be obtained, to connect with the Agricultural College a school for the education of the sons of the gentry in classics, and all the branches usually taught in first-rate schools, for which there is ample accommodation.—*Southern Reporter.*

Grafting Currants.—The Gardener's Chronicle recommends for the pretty appearance presented, as well as for improved flavour, to graft currants of different colors, as the red, black, and white, variously intermixed, on stocks trimmed up to a single stem, three or four feet high. The tops may be headed down to a dense compact head, or trained as espaliars in the horizontal or fan method, the two latter modes of training, by th ofree exposure to sun and air, much improving the quality of the fruit. The importance of trimming the bushes up to single stems to improve the fruit and facilitate clean culture, instead of suffering two hundred and fifty suckers to shoot up all round into a dense brush heap, is very obvious to those who have tried both.

Trial of Ploughs.—A trial of various ploughs by Cottam and Hallen's dynamometer, took place on the farm of Charles Porcher, Esq., at Cliffe, on Tuesday, Dec. 13, 1844, of which the result may be interesting to farmers, as showing the great variations in draught of different implements. The field was of a light loamy soil, which had been very deeply ploughed for two years following, first for Swedes, and then for white turnips and carrots, and the heavy rain on the previous day had rendered this soft land wet and very clingy, so that from the general draught of the ploughs perhaps four or five stones might be fairly deducted. Depth of furrow 7

inches; width 9 inches.—1. Ransome's A plough—one wheel 31 stones; as a swing plough 40 stones. 2. Garrett's A plough—one wheel 35 stones. 3. Wood's patent plough, with a wheel astern and one wheel in front 39 stones; without either wheel 49 stones. 4. Howard's patent plough—two wheels 30 stones; without the wheels 40 stones. 5. Ordinary Dorset plough—one wheel 36 stones. By this as by all the other experiments made by Mr. Pusey and others, it clearly appears that the wheels are lightest in draught. It was observed that the heavy work was done in good style by two Suffolk punches, though with the ordinary horse of the country most farmers would have used three and some four horses.

Religious Scruples of Farm Servants.—On Monday week one of the farm servants of Mr. George Ritchie, at the Rynd, was brought up before Mr. Barclay, sheriff-substitute of Perthshire, at the instance of his master, for disobedience and neglect of duty, in so far as on the preceding day, being Sunday, he refused to clean out the stables in the morning, alleging it was an improper service on that day; and, in consequence, the rest of his fellow-servants also declined lending a hand to that necessary work of cleanliness. It appeared that the man belonged to Mr. Cumming's (Free Church) congregation at the Bridge of Earn, and either from misunderstanding some doctrine he had heard, or anxious to get early away to the church he attended, which is fully three miles from the Rhynd, he had come to the resolution of evading his stable duties on that morning, although the cleaning out the litter, which was all that was objected to, did not require more than from ten to fifteen minutes to perform. The man, when questioned as to the ground of his objection, contented himself with saying "it was not legal"—meaning, probably, it was not scriptural. Mr. Barclay allowed a proof to both parties. That for the pursuer was heard on Friday last, when Mr. Ritchie clearly established that the duty required was necessary for the health of the animals, and that it was consistent with the practice of the district to be performed on Sundays. The defender endeavoured to overturn this evidence on the following day, by the testimony of farm servants, but failed, and the sheriff sentenced him to eight days' imprisonment in Perth gaol.

Cabbage and Bean Crop.—Mr. Pusey reported to the Council, that Lord Lovelace's plan of growing the thousand-headed Cabbage as a crop, intermixed with the Bean-crop, had been tried by one of his tenants in Berkshire, Mr. Brooks, of Lyford, and found to answer so well, that Mr. Brooks intends to grow five acres in this way in the present year. The Beans are set in close double rows, with wide intervals between each pair of rows, in which the cabbages are planted in May, and afford a most luxuriant crop of green food upon heavy land during the present month. Mr. Pusey considered this method of Lord Lovelace's one of the best plans which had been devised for enabling the farmer to grow green food on very heavy land.—Mr. Hayter fully concurred in the value of this arrangement, which he had himself adopted with great success, and obtained a magnificent field of Cabbages for his young lambs.

Cirencester Agricultural College.—The Committee of the proposed new college have selected the design of Messrs. Dakes and Hamilton, architects of Gloucester and Cheltenham, from a large number, among which, we understand, were some from architects of great eminence in London. The college will occupy the delightful site on Lord Bathurst's grounds, known as Port-farm, near the railway station at the junction of the Stroud and Tetbury's roads, thus presenting a perspective of two bold fronts; the farm itself being attached to the end of the main building, altered to meet the domestic requirements of the institution, and decorated sufficiently to be in character with the new structure, which, with this addition, will form an entire frontage of nearly 250 feet. The design is in the Tudor style, of three stories high; the upper story being lit by picturesque old fashioned dormer windows, of the style so prevalent among the collegiate buildings of Oxford. The centre is occupied by a bold tower, the upper part of which is intended to form an observatory for metereological and other scientific purposes. We understand that the committee intend to complete only the main portion of the building at present, and that the works are to be speedily commenced. —*Wilts Independent.*

lishes a Royal ordinance, instituting at Paris a council of *prud'hommes*, composed of 15 members and 10 substitutes, elected from among the manufacturers, foremen, or licensed operatives, engaged in all branches of the metallic industry. The latter are divided into five categories, which are each to elect two, three, or four *prud'hommes*, according to the importance of their respective branches of industry. The duty of that council will be to terminate by conciliatory means, without any judiciary forms or expense to the parties, the differences which daily arise between the manufacturers and the workmen they employ, the foremen, and the operatives and apprentices. Any appeal from their decisions is to be tried by the Tribunal of Commerce. *Similar councils already* exist in 66 cities and towns of France, where they have exercised the most beneficial influence. From 1830 to 1839, the number of affairs submitted to their appreciation was 135,730; of these 128,319 were conciliated, and 3,573 abandoned by the parties. The councils pronounced 3,838 judgments, against which only 155 appeals were made.

State of Agriculture in France.—The *Journal des Debuts* publishes the following observations on the state of agriculture in France:—"Our situation is deplorable. Meat in France is scarce and dear. It is a species of food almost unknown to the population in general. The peasants, particularly in the poor departments, do not eat flesh meat ten times in the year. Our operatives cannot procure sufficient, and thence arises our inferiority in many respects with regard to manufactures. It is well known that the English operative can perform twice as much work, on an average, as a French workman. This fact has been established in the construction of our railroads; but when it was inquired what was the relative proportion of animal food consumed by each labourer, it was ascertained that the British labourers consumed twice as much flesh meat as the French. We can easily comprehend, therefore, the disadvantage which our manufacturers labour under in the competition with other countries in consequence of the high price of meat. The inferiority of our agricultural produce acts in a most unfavourable degree upon our manufactures. It has often been asserted that France ought to produce sufficient iron for her own consumption. Iron has been declared as necessary in war as in agriculture. Horses likewise are necessary in war, and we still have been obliged to import 30,000 more than we exported between the years 1823 and 1841. Those were the reasons why the proposition of M. d'Angeville on irrigation was so well received in the Chamber of Deputies on Tuesday. The numerous classes which devote themselves to agriculture will learn with gratitude that their interests are attended to. The proposition of d'Angeville, as amended by the committee, stands thus: 'Every proprietor who wishes to avail himself of irrigation for his lands may demand the passage of all natural or artificial water of which he has a right to dispose through an intermediate property, on the condition of paying a just indemnity.'"

The Colouring Matter of Plants, called chromule, is contained in cells protected by the epidermis, or thin transparent covering of the surface, which, by its transparency, permits the colour to be transmitted. It is chemically composed of carbon in large quantities, hydrogen, and a small proportion of oxygen; it is found in the leaves of plants, and proceeds from the carbon fixed by the decomposition of carbonic acid; its colour in this situation is green, and as such it may be considered as carbon, presented by the vegetable kingdom in its *least degree* of combination with oxygen. Many leaves change their colour at the approach of winter, and frequently assume a bright red appearance (as is the case with the Virginian creeper,) a circumstance caused by their having

ceased to fix carbon during the day, but continuing to absorb oxygen at night. This condition, then, may be assumed as carbon, or chromule, in its *least* amount in *quantity*, under its *highest state* of oxygenation, and is most frequently met with in flowers whose function (the reverse of that of leaves) is to part with carbon, whilst they absorb oxygen. We have in these examples the colouring principle of plants (carbon,) presented under its two most opposed conditions, namely, in an abundant quantity, and little oxydised, assuming a dark green colour; whilst, in the opposite state, there exists only a small proportion, but at the same time it is exhibited in its highest degree of oxygenation, appearing as a bright red.—*Medical Times.*

White Belgian Carrot.—Sir Charles Burrell, Bart., M.P., of Knepp Castle, near Horsham, Sussex informed the Council that he attributed his growth of 1,600 bushels of White Carrots per acre last season (without including the green tops previously to carting away being severed from the Carrots, for feeding cows, &c.) principally in so dry a season as last year, to the effect of previous Pearson-plough drainage, as recommended by Mr. Hodges, and to the circumstance of the ground having been well prepared by spade husbandry. Sir Charles had always found the latter practice preferable to double-ploughing or subsoiling on heavy soils; for, in addition to an increase of crop, amounting by estimate to 300 bushels per acre, great benefit arose, in his opinion, to subsequent crops, by the good effect produced by that operation on the land.

The Nature of Warp.—Mr. Charnock of Holmefield House, near Ferrybridge, Yorkshire, communicated to the Council the result of his inquiries into the nature of the deposit of rivers, by means of the microscope and his deductions from these investigations as to the cause of the great fertility of warped land, which he conceived to arise from the presence of those infusorial animalcules and their remains, so well known to exist in the deposit of all rivers flowing in a long and slow course through flat, alluvial districts, and whose character, through the labours of Dr Ehrenbergh, of Berlin, has been so distinctly traced, and made known to the scientific world.

Virtues of Oatmeal.—*Blackwood's Magazine*, in discussing the comparative virtues of wheaten flour and oatmeal, thus throws down the gauntlet to England, after having by a few figures proved the superiority of the latter:—"What do you say to these numbers, Mr. Cockney? You won't pity us, Scotch oatmeal eaters any more, we guess. Experience and science are both on our side. What makes your race-horses the best in the world may be expected to make our peasantry the best too. We offer you, therefore, a fair bet. You shall take ten English ploughmen, and feed them upon two pounds and a half of wheaten flour a day, and we shall take as many Scotch ploughmen, and feed them upon the same weight of oatmeal a day—if they can eat so much, for that is doubtful—and we shall back our men against yours for any sum you like. They shall walk, run, work—or fight you, if you like it, and they shall thrash you to your heart's content. We should like to convince you that Scotch porridge has some real solid metal in it. We back the oat-cake and the porridge against all the wheaten messes in the world. We defy your home-made bread, your baker's bread, your household bread, your leaven bread, and your brown Georgies—your fancy bread and your raisin bread—your baps, rolls, scones, muffins, crumpets, and cookies—your bricks, biscuits, bakes, and rusks—your Bath buns and your Sally Lunns—your tea-cakes, and saffron-cakes, and slim-cakes, and plank-cakes, and pan-cakes, and soda-cakes, and currant-cakes, and sponge-cakes, and seed-cakes, and girdle-cakes, and singing-hinnies—your short bread and your currant buns—and if there be any other names by which you designate your wheaten abominations, we defy and detest them all. We swear by the oatcake and the porridge, the substantial bannock and the brose—long may Scotland produce them, and Scotchmen live and fight upon them!"

The Murrain on the Continent.—The *Presse* publishes a second article on the typhus fever at present raging among the oxen in Germany, and on the best mode of preserving France from that scourge. "First," says the *Presse*, "it is necessary to state an important fact, the result of long experience, which is, that the malady is completely incurable, and that no preventive measure can protect animals from its attack. We insist on this point, in order that the Government may not, like other Governments during the last century, lose much valuable time in seeking for preservative means, which they might have employed in efficaciously opposing the progress of the malady. In the year 1770, the Dutch Government proposed a prize of 80 000 florins to any person who should discover a specific against the epydemy; and, whilst the colleges of Leyden and Utrecht were discussing the subject, the contagion carried off 284.531 oxen in the United Provinces. There is another fact not less important to be mentioned. This malady never developed itself spontaneously either in France or in the other parts of western Europe. It has always been introduced into those countries either from the south of Russia, Wallachia, Moldavia, or the marshes of Hungary, countries where it appears to be endemic, without, however, exercising as great destruction there as in the countries in which it appears from time to time. Every time the typhus has appeared in Germany, Italy, France or Belgium, it has been ascertained in the most positive manner that it has been imported by animals arriving from the above named countries, which may be considered as the permanent focus of this epidemy. With respect to the mode of guaranteeing France from this scourge, the best appears to be an absolute prohibition against the admission into France of foreign oxen. Common sense indicates this as the surest mode of preventing the infection from penetrating into France. Should, however, notwithstanding every precaution, the disease unfortunately appear in France, to abandon the malady to itself would be to incur the almost certain risk of seeing the epidemy cease solely for want of aliment. During the last century several countries in Europe, amongst others the Campagna di Roma, lost the entire of their horned beasts. Entire herds were destroyed, and it was found necessary to import oxen in order to replace those which were carried off. Of all measures of repression, the most efficacious are the interruption of all communication with diseased cattle, and their destruction and burial under the earth as soon as they are found to have caught the infection. During the last years of the empire, whilst the typhus abandoned to itself penetrated into France, and caused the destruction there of 400 000 head of oxen, its progress was arrested at Utrecht, where it was brought by Russian cattle, and the consequences avoided by the prompt measures adopted by the authorities—the interruption of all communication from abroad, and the immediate slaughter of all diseased cattle. We may add in termination that the public would do well to be on their guard against favourable accounts brought from the theatre of the contagion. Those countries are interested in maintaining a communication from abroad, and they will, consequently attenuate the evil."

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