AGRICULTURAL.

ON THE ECONOMY OF STALL FEEDING.

In a lecture on the fattening of cattle, delivered to the Royal Agricultural Society and reported in the *Gardeners' Chronicle*, I stated that some experiments were then in progress at Whitfield Farm, through the kindness of Lord Ducie, which I believed would confirm some of the theories adduced in that lecture. I now beg to redeem my promise of communicating to the public the results of these experiments. They were carefully superintended by Mr. John Morton, from whom I have received much assistance on this and on many other occasions

Liebig, in his work on Animal Chemistry, has defined more accurately than any preceding writer the source of animal heat, and the constituents of the food used in its support.—He has shown that warmth is an equivalent for food, and that cold, on the other hand, renders necessary a greater supply of food, by carrying off rapidly the heat which its combustion engenders. He has also pointed out that motion is always accompanied by a waste of matter in the body, and it followed naturally from this that an economy of food was necessarily the result of an economy of motion. The experiments of Lord Ducie and Mr. Childers, upon feeding sheep in sheds, afforded a powerful practical illustration of these theories.—The warmth communicated by the sheds were equivalent to a certain amount of food, and the deprivation of motion occasioned a diminished waste of the tissues of the body, and, therefore, a corresponding saving of aliment To illustrate these views more fully the following experiments were instituted on five lots of sheep, each lot consisting of five sheep:—

No. 1 lot was fed out of doors, and was therefore exposed to all the influence of atmospheric changes.

No. 2 lot was kept under an open shed, and therefore was less exposed to the inclemencies of the weather.

No. 3 lot was placed under an open shed, similar to the last lot, but in this case the sheep were kept solitary, *i. e.*, each was confined to a space of 3 ft. by 4 ft.

No. 4 lot was placed under a close shed in the *dark*.

No. 5 lot was kept under a shed like No. 4, except that each sheep was separated, and confined to a space of 3 ft. by 4 feet.

These different lots were allowed 1 pint of Oats for each sheep per diem, but were supplied with as many Swedes as they felt disposed to eat; the weights consumed were accurately determined. The live weights of the sheep were ascertained before the commencement, and at the conclusion of the experiments the results were as follows:—

Lots.	Live Weight Nov. 18.	Live Weight, Mar. 9	Increase in Live Weight.	Weight of roots eaten.	Increase in Live Weight for each 100lbs of roots eaten.
1	103 lbs.	131 1-3 lbs.	23 1-3 lbs.	1912 lbs.	1 lbs. 2 oz.
2	104	132 2-5ths	28 2-5ths	1394	2 0
3	103	130 1-5th	22 1-5th	1238	1 8
4	102	129 4-5ths	27 4-5ths	886	3 1
5	111	131 3-4ths	20 3-4ths	889	2 4

In the consideration of these experiments, we may refer to the "roots" alone, as the quantity of Corn supplied to the sheep was in all cases the same. It will be seen that the first lot, or that which was exposed to the cold, ate more than double the quantity of food consumed by the sheep fed in a dark warm shed. Exposure to cold winds abstracted heat so rapidly from the bodies of the sheep, that a large amount of food was necessary to support their proper temperature. That this excess of food was wholly employed for this purpose, and entirely lost as far as the farmer is concerned, is obvious, for the absolute increase in weight of the first and last lots is nearly equal, although the relative increase for the food consumed is much in favour of the latter. Thus, also, it will be seen, that although the second lot of sheep received 518 lbs. of food less than the first, yet that lot reached a greater weight both absolutely and relatively. The second lot had the protection of a shed, and, therefore, did not require so much food to keep up the proper temperature of their bodies as the exposed sheep. In these two cases, both lots were similarly situated with regard to exercise. In lots 3 and 5, a diminished space was afforded, but without advantage, probably from disturbing the placid temperaments of the animals, as they were observed to fret and lose their appetites when thus separated. The result attending the experiment with the 4th lot is highly interesting. The sheep forming this lot were confined in the dark. In this state there were no inducements for the sheep to move about, or even to remain in a waking state, except when impelled by hunger to eat food. Hence they passed much of their time in sleep. During sleep the voluntary motions ceased, and there was small waste in the tissues of the animal, which now possessed almost entirely a vegetative life and increased rapidly in size, with small consumption of food. Although eating considerably less than one-half of the food consumed by those sheep which were exposed to the weather and to the causes of waste produced by voluntary motion, this lot increased nearly as much in absolute weight at a relative economy of food nearly three times as great.

The results of these experiments are very favourable to the views brought forward in the lecture referred to. They will, I trust, confirm, if proof be still requisite, the economy of stall-feeding, and the principles on which this practice depends. I am quite aware that considerable evils have been found to attend the system in certain cases; but in every case which I have examined, the evils seem wholly attributable to the manner in which the system was carried into operation, and not to the system itself. Cattle are confined in sheds, built without any regard to ventilation or cleanliness; they become diseased; and stall-feeding is pronounced by the farmer, who thus suffers the effects of his own want of care, to be very injurious, and to be productive of evil consequences to the health of his stock. If cattle are exposed continuously to an impure atmosphere, the tone of their system becomes depressed, and disease follows, sometimes exhibited in the form of diarrhœa, frequently of rot, very often of consumption, or of one or other of the many diseases to which cattle are liable. But none of them are the results of the system, nor have they occurred when due regard has been paid to cleanliness and ventilation. These are points which retard the progress of fattening much more than farmers are generally aware of. Attention to these circumstances would, I feel convinced, render more sure the favourable results which follow from the communication of warmth and the deprivation of excessive motion, and would be further productive of economy in the returns for food supplied.—*Lyon Playfair, Royal Institution, Manchester.*

EFFECTS OF SOAKING SEEDS IN CHEMICAL SOLUTIONS.—I steeped the seeds of the various specimens exhibited, in sulphate, nitrate, and muriate of ammonia, in nitrate of soda and potash, and in combinations of those, and in all cases the results were highly favourable. For example, seeds of Wheat steeped in sulphate of ammonia on the 5th of July had by the 10th of August, the last day of the show, tillered into nine, ten, and eleven stems of nearly equal vigour; while seeds of the same sample, unprepared, and sown at the same time, in the same soil, had not tiltered into more than two, three, and four stems. I prepared the various mixtures from the above specified salts exactly neutralised, and then added from eight to twelve measures of water. The time of steeping varied from 50 to 94 hours, at a temperature of about 60 deg. Fahrenheit. I found, however, that Barley does not succeed so well if steeped beyond 60 hours. Rye-Grass and other gramineous seeds do with steeping from 16 to 20 hours, and Clovers from 8 to 10, but not more; for, being bi-lobate, they are apt to swell too much and burst. The very superior specimens of tall Oats, averaging 160 grains on each stem, and eight available stems from each seed, were prepared from sulphate of ammonia. The specimens of Barley were prepared from nitrate of ammonia; they had an average of 10 available stems, and each stem an average of 34 grains in the ear. The other specimens of Oats which were next the most prolific, were from muriate of ammonia, and the promiscuous specimens of Oats were from nitrates of soda and potash—strong, numerous in stems, (some having not less than 52,) and not so tall as either the preparations from the sulphate or muriate of ammonia.—*Mr. Campbell, Transactions of the Highland Society.*

THE FORGET-ME-NOT.—There is a little common plant which grows in our woods and adorns the banks of our rivulets, the unassuming beauty of which is universally acknowledged by all; I mean the common Myosotis, or, to give it its more familiar and more expressive English name, the Forget-me-not. There is a charm about the very name which tells of friendship and constancy in a fickle world; and tho' Shakspeare asks "What's in a name?" and adds, "A Rose by any other name would smell as sweet," yet there are many of our common plants which, if they were divested of their old names, would with them lose the power which they possess of calling up old associations, to which very much of their interest is owing. But what I wish to call attention to now, is the fitness of this plant for bedding out, for planting in masses in the front of Shrubbery borders, and more especially for winter forcing. It has long been used for bedding out at this place with the happiest effect, and where masses of blue colour are required few plants excel it. It costs little trouble, and continues in flower nearly all the summer. While the almost countless varieties of Verbena furnish us with every shade of red, plants of a blue colour fitted for small beds are scarce. No plant better repays the trouble of forcing than this. It is only necessary to take up the roots from the border where they are growing, divide them into small pieces, plant them five or six in a small pot, and place them on a spare shelf in any house that may happen to be at work. In three or four weeks afterwards they will begin to display their pretty little blue and yellow flowers, which in a nosegay greet us like old friends, and by their associations with pleasant rambles, shady woods, and sunny skies, give rise to pleasarable sensations in the mind, which are not produced by the more gaudy colours of exotics.—*W. H. M. Trentham.*

IMPORTANCE OF CO-OPERATION BETWEEN THE FARMER AND CHEMIST,—We believe that by far the greatest obstacle to the advancement of scientific agriculture hitherto has been the want of co-operation between the farmer and the chemist. Each has tried to move forward alone, and thus each has been led astray. We may not inaptly apply to them the well-known story of the lame and the blind, neither of whom alone could proceed with safety; but when united arm-in-arm, the defects of each were fully compensated for by the superior advantages of the other. Thus, the farmer, from his knowledge of practice, is enabled to progress in any given direction but, from his want of acquaintance with the fundamental principles of his art, may justly be considered blind; whereas, the chemist, however clearly he may see the end to be attained, makes but a very lame progression, owing to his ignorance of practice. Let the two but consent to become mutually dependent, and, proceeding arm-in-arm, the assured step of the well-practiced farmer will be guided in the right way by the clear-sighted knowledge of the enlightened chemist.—Dr. MADDEN, *on the Advantages of Extended Chemical Analysis to agriculture.*

HINTS TO FARMERS.—In a treatise on Productive Farming, just issued from the press, the following observations occur:—"It is in vegetable as in animal life: a mother crams her child exclusively with arrow-root—it becomes fat, it is true, but, alas! it is rickety, and gets its teeth very slowly, and with difficulty. Mamma is ignorant, or never thinks, that her offspring cannot make bone—or what is the same thing, prosphate of lime, the principle bulk of bone—out of starch. It does its best; and were it not for a little milk and bread, perhaps now and then a little meat and soup, it would have no bones and teeth at all. Farmers keep poultry; and what is true of fowls is true of a cabbage, a turnip, or an ear of wheat. If we mix with the food of fowls a sufficient quantity of eggshells or chalk, which they eat greedily, they will lay many more eggs than before. A well fed fowl is disposed to lay a vast number of eggs, but cannot do so without the materials for the shells, however nourishing in other respects her food may be. A fowl with the best will in the world, not finding any lime in the soil, or mortar from the walls, nor calcareous matter in her food, is incapacitated from laying eggs at all. Let Farmers lay such facts as these, which are matters of common observation, to heart, and transfer the analogy, as they justly may do, to the habits of plants, which are as truly alive, and answer as closely to evil or judicious treatment as their own horses."

THE POTATO CULTURE.

It is unnecessary to enter fully into detail on the subject of Potato Culture, but there are two points to which we may usefully direct the attention of our readers: the diseases to which the plant is subject, and the manures suitable for it.

The Potato plant has of late years been subject to several diseases which, though many remedies have been suggested for them, still occasionally injure or destroy our harvests.

The Curl, so called from the crumpled appearence which the leaves assume under its influence appears to be owing to the over-ripening of the tubers to be used as seed. The experiments of Mr. Dickson, reported in the "Memoirs of the Caledonian Horticultural Society," show that, while sets from the waxy seed of the Potato produced healthy plants, those from the ripened seed did not vegitate at all, or produced curled plants. For further particulars on this see an article by Mr. Deans in this Paper.

The Rot, or *Taint*, which causes the entire destruction of the set, is also probably owing to a constitutional defect, arising from circumstances connected with the cultivation or treatment of the plant. It is believed by many that the liability of the Potato to this disease is owing to planting cut sets instead of whole ones: and the idea is corroborated by the fact, that means taken to produce upon the cuts sets an artificial skin, have occasionally possesed a beneficial influence. Thus, in the September Number of the "Quarterly Journal of Agriculture" for 1841, there is a paper by Mr. R. White on what is stated to be "a simple means of preventing the failure of the Potato crop." It consisted in riddling over every basketful of newly cut sets a shovelful of hot lime, and then turning them over and over again till the lime was well taken up by the sets, when they were put into a heap three or four feet thick, and kept for two or three weeks. "The hot lime had the effect of stopping the flow of the juice, and of encrusting a strong skin upon the sets." The experience of several years is quoted in this article in favour of this plan. We should think that no good end was obtained by allowing the sets to lie in such a quantity together; the skin would form with equal certainty on the cut surface without thus exposing them to risk of injury from heating.

The following remarks are extracted from the 15th Part of Mr. Stephens's "Book of the Farm:"—

"Were seed Potatoes securely pitted—not over-ripened before they were taken out of the ground—the sets cut from the crispest tubers and from the waxy end—the dung fermented by a turning of the dunghill in proper time—led out to the field, quickly spread, the sets as quickly dropped on it, and the drills quickly split, there would be little heard of the failure even in the driest season—at the same time the precaution of obtaining seed frequently from an elevated and late district compared to where the seed is to be planted, should not be neglected. I own it is difficult to prove the existence of constitutional weakness in any given tuber as its existence is only implied by the fact of the failure; but the hypothesis explains many more facts than any other, than atmospheric influence—for example, producing the failure like epidemic diseases in animals, for such influences existed many years ago as well as now. The longer the cultivation of the tuber of the Potatoe, which is not its seed, is persevered in, the more certainly may we expect to see its constitutional vigour weakened, in strict analogy to other plants propagated by similar means; such as the failure of many varieties of the Apple and Pear, and of the cider fruits of the 17th century. This very season, 1843, contradicts the hypothesis of drought and heat as the primary cause of the failure, for it has hitherto (to June) been neither hot nor dry, while it strikingly exemplifies the theory of constitutional weakness, inasmuch as the fine season of 1842 had so much over-ripened the Potato—farmers still unaware of the cause of the failure, permitting the Potatoes they have used for seed to become over-ripened—that the sets this spring 'did not vegetate at all,' even in the absence of heat and drought, and in the presence of moist weather. Had the Potatoes been a little less over-ripened in 1842 the sets from them might have produced only curl this season, though it is not improbable that the same degree of over-ripening may cause entire failure now, that would only have caused curl years ago; and as over-ripening was excessive last year, owing to the very fine weather, so the failure is extensive in a corresponding degree in this, even in circumstances considered by most people preventive of its recurrence, viz:—in moist weather. And observe the results of both 1842 and 1843 as confirmatory of the same principle, illustrated by diametrically opposite circumstances. The under-ripened seed of the bad season of 1841 produced the good crop of Potatoes of 1842, in spite of the great heat and drought existing at the time of its planting in 1842; while the over-ripened seed of the good season of 1842 has produced extensive failure in spite of the coolness and moisture existing at the time of planting in 1843. How can heat, drought, or fermenting dung account for these results?"—*London Gardener's Chronicle and Agricultural Gazette.*

MIXTURE OF SOILS.—In many districts there are varieties of land which, by an equitable exchange, make each other productive, without the addition of manure. For instance, sand and clay; neither of these by itself is so fertile as when they are mixed together. All gardeners know the craving nature of a sandy soil, and the almost impossibility of doing anything with clay in its natural state; yet men are found who obstinately toil on with each separately, when they have both opportunity and facility of bringing them together, thereby saving both present and future outlay.—*Falcon.*

MODE OF ASCERTAINING THE QUALITY OF SEEDS.—Such seeds as do not naturely require a very long time to germinate, are sometimes readily examined, as regards their goodness, by being placed in hot dung. The following particulars of the mode indicated by General Ygonet is recorded in the "Revue Horticole." A pinch of seed is sown in a pan, which is plunged in fermenting horse-dung, the seed being covered with nearly half an inch of soil, and over this rather more than an inch of dung.—*London Gardeners' Chronicle.*

ANTI-MAGNETIC PROPERTY OF THE ONION.—The magnetic power of a compass-needle will be entirely destroyed or changed, by being touched with the juice of an onion. This fact may seem trifling; but we regard it as one of the first importance, and, investigated, may lead to consequences equally astonishing as the discovering of the magnet itself.