

Writer—Why, that the grain is in a state of *decomposition*.

Farmer—This is rather a novel idea, which I am not prepared to admit. I cannot understand how young grain should come into that state.

Writer—I shall endeavour to bring the subject down to the meanest capacity. What do you call this?

Farmer—Why, child, that is *smut*.

Writer—Indeed, and what may smut be?

Farmer—It will take a cleverer fellow than you to tell that.

Writer—Right! I intend that you shall.

Farmer—I! I don't pretend to know anything about it.

Writer—Because your modesty masks your merits. Now apply your ocular and olfactory organs to this smut-ball, and tell me its chief features.

Farmer—Why, it is a black powder, exhaling a highly fetid odour, something like stinking fish.

Writer—Just so; and what condition must fish be in before they stink?

Farmer—Dead, I suppose you mean.

Writer—Something more; dead and *decomposing*.

Farmer—Still I cannot understand why, admitting the grain to be dead and decomposing, it should give out this fetid odour.

Writer—You will find the explanation in attending to the constituent elements of the wheat. This grain, as you are aware, contains an element which distinguishes it from and renders it superior to all other cereal grains—gluten. This is a highly animalized substance; the germ of the grain is entirely composed of it, and hence, when putrefying, it gives out the fetid odour peculiar to animal matter in that state. The flesh of fish contains a much larger proportion of gluten than the flesh of animals, and hence, as you remarked, the identity between the fetor of smut and stinking fish. The smut of oats and barley is devoid of the peculiar fetor in question, simply because the grain contains no gluten; and this difference is, I conceive, logically conclusive as to the nature of smut.

Farmer—Then you reject the parasitic theory?

Writer—Because it will not explain the facts. Were this theory sound, the longer the smut-ball the more intense the fetid odour; but this is opposed to fact. The little germ, the future being, when observed in its earliest stage of smut, exhales the fetid odour in a more concentrated form than when the ball has attained its full size. The farina of the grain, which is superadded to the germ containing the

gluten, does not augment the feter. A grain of wheat may be aptly compared in its constitution to an egg of a bird; indeed the exactest analogy obtains between them. The egg consists of two parts, the yolk and the white: the germ of the future being, and the matter by which it is nourished until capable of carrying on independent existence from the external world; so a grain of wheat consists also of two distinct substances, the gluten and the farina,—the germ of the future plant, and the matter which yields it support until its roots are sufficiently fixed in the soil to derive therefrom the palladium of life. The feter of a rotten egg is not a very mysterious matter: neither, henceforth, I trust, will be the feter of a rotten grain of wheat—*alias* smut. This fact, coupled with the distinction already alluded to between smut in wheat, and the same in oats or barley, I conceive, sets this long-disputed question at rest. The adherents of the parasitic theory have found themselves constrained to invent a different species of parasite for oats and barley from that of wheat, to meet the difficulty arising from the absence of the feter in these species of corn, but the creation is entirely gratuitous; a reference to their respective constituent elements accounts for the distinction, simply and naturally, without the aid of any new creative agency.

Farmer—There is a fact, however, your theory does not account for. If the germ be dead and decomposing, how comes it that the straw is not in the same predicament?

Writer—For the same reason that the syphilitic poison may lurk in the human system without showing itself outwardly; and yet the offspring of a tainted person come into the world dead and putrid. But the straw *is* affected. If you examine it in its green state, you will find it less juicy and saccharine to the taste, and when withered, instead of possessing the tenacity of sound straw, it is brittle as glass, and may be rubbed to powder by the fingers. In a word, the *sap is unsound*, and this produces both unsound straw and unsound grain.

Farmer—But granting that your view is as sound as specious, it only shifts the difficulty without removing it. How comes the sap to be unsound?

Writer—Ay, that is the pith and marrow of the matter, which we shall discuss presently. But to return to the fly. It is on the germ they seize, depositing their eggs on its surface precisely as the blue fly deposits her larva on the surface of meat; and as meat must be in a state of decomposition before the fly blow it or the larva derive any nourishment therefrom, so must the animalized matter, the

gluten of the grain, be undergoing incipient decomposition ere the fly attack it or the ova can feed on its putrescent emanations. Turn your eye to the edge of that stream, where you see thousands of insects flitting above the surface of the still water. What is their business there? They are feeding on the putrescent emanations poured forth from the surface of the stagnant water when acted upon by solar heat. You see none in the centre of the stream, where the water is in rapid motion.

Farmer—Then you mean to maintain that all organized matter is in an unhealthy state before the insect tribes will attack it.

Writer—Precisely so; and you will find this point well illustrated in the ravages of the turnip-fly. When the plant comes up strong and healthy, it sets the insect at defiance; but when sickly, it is swept off at once. The fact is so well known, that the farmer, in putting his turnip-crop into the ground, sometimes reserves a part less highly manured, where the plant coming up puny and sickly, the depredator may be tempted to spare the choice crop. This is scientific farming with a vengeance! The lord of the soil compelled to throw a bribe to the meanest insect that crawls.

Farmer—Having fully dilated on the evil, doubtless you are equally prepared with the remedy?

Writer—Let us return to the smut, and the influences which occasion it. You have drawn a similitude between smut and putrid fish; now, if you wished to avert the fish from falling into this state, what measure would you adopt?

Farmer—Salt them of course.

Writer—Well, and suppose you were to try the same plan with wheat?

Farmer—What, salt wheat? Preposterous.

Writer—Reflect a moment, you will find it is the very course you do adopt, and the only one that offers any chance of success. You brine it and lime it; you impregnate it with a strongly antiputrescent salt, the muriate of lime; you impart to it a quantity of that element which is essential to its healthy state; and instead of a diseased, putrescent product, you get a sound, healthy offspring. Upon what principle do you farmers apply lime to your land?

Farmer—To dissolve crude vegetable matter, sweeten the soil, and make it work well.

Writer—This is rather a vague notion of its effects; upon this principle, I presume you spread a thick covering of weeds on the land before applying the lime; and when you talk of sweetening the soil, do you mean after the manner you

sweeten your tea with sugar? And as for its working the land, I opine one ploughing would work it much more effectively. I have a shrewd suspicion you farmers are ignorant of the principle upon which lime benefits the soil, and, therefore, ignorant as to when its application is indicated, and consequently you derive but comparatively small benefit from so energetic an element. Pray, when was the soil on which we stand dressed with lime?

Farmer—Not for some years. I had the ground well cleared, and deemed lime unnecessary.

Writer—But, in its stead, you have crammed it with fresh stockyard manure; and you might as well attempt to grow sound wheat out of a fomenting dunghill. Before putrescent manure can afford nourishment to vegetable organization, it must undergo digestion in and assimilation to the soil; and unless you add lime to it, considerable time is required to effect this process; and seed thrown in while fermentation is yet going on will not produce a healthy plant, because the sap eliminated is unsound. A little lime added completely changes this state of things—fermentation is arrested, the manure quickly digested, and the plant, moreover, furnished with that element which keeps it in a state of healthful vigour. The theoretical and practical agriculturists have been long and determinedly at variance on the question as to the superiority of fresh fermenting farmyard manure as food for plants, over the same well rotted before being incorporated with the soil. The theoretical, headed by Sir H. Davy, maintain that the gases given out by fermenting manure being food for plants, there is a great waste of material in allowing fermentation to go on out of the soil; while the practicals, without pretending to account for the fact, aver that putrescent manure, in a state of fermentation, is most injurious to vegetable life. Now, the theory of the chemical agriculturist is based upon what is but too common in all systems of science—a false fact. The gases given out by fermenting manure is *not* food for plants, but the very reverse: they are as deleterious to vegetable as they are to animal life. It is strange how tenaciously phytologists cling to this hypothesis, that gases are food for plants. Carbonic acid gas has long been regarded as the source of vegetable gas; that the gas is decomposed and the carbon appropriated by the plant, while the oxygen is set free to the atmosphere; and that, by this very beautiful process, the balance between the carbonic acid gas and the oxygen in the atmosphere is duly preserved. Now this may be very beautiful in

theory, but, unfortunately, it is not true; in fact, carbonic acid is equally fatal to vegetable as to animal life. Priestly, a name as dead to science as detestable to dogmatism, placed some plants over a fermenting vat, and they all quickly died. This theory of plants, then, decomposing carbonic acid, and thereby preserving the purity of the atmosphere—a theory which has long had possession of the scientific world—requires revision, for assuredly it is unsound. It is just about as feasible to say, that animals are nourished by carbonic acid and other gases, as to aver that vegetables are. These gases are constantly forming in the alimentary canal of animals, but they are the product of an unsound process, as we shall see when the subject of indigestion comes to be canvassed: and the exercise upon the frame of the animal not a nutritious but a deleterious agency. The great practical point to be deduced from the foregoing views, is to hinder the formation of the gases, and thus prevent a great portion of the most valuable part of the manure running to waste; and this is to be accomplished by mixing lime or any other antiseptic salt along with it. The Chinese, the best practical farmers in the world, know how to take advantage of this truth. They destroy the intensely putrescent tendency in night-soil by means of lime, and form it into cakes, which they sell as a manure worth its weight in gold. Hence one of the most common sources of diseases in vegetable organization is an excess of dung, and a deficiency of lime or other saline element applied to their roots; and to this evil, I suspect, is owing the present peril of your crop. To illustrate this position still further: let two given portions of the same soil be heavily manured with farmyard manure, but in addition, let one of them be well dressed with lime, say fifty bushels an acre; let them both be immediately sown with the same wheat, and the proportion of smut in the limed crop shall be to that in the other as one to ten. Nay, further, the quality of the grain off the limed soil will be much superior, containing a larger proportion of gluten, and, therefore, of greater specific gravity.

Farmer—Then you mean to supersede the necessity of dressing the grain in the ordinary way previous to sowing?

Writer—By no means; every precaution ought to be adopted against this formidable foe to the farmers' staple crop.

Farmer—Then, what process do you recommend?

Writer—Steeping it thoroughly in a combination of earthy and alkaline salts: say salt and lime, or common sea-water,

and these should be applied hot, the more thoroughly to penetrate the seed. But if you be careful to sow vigorous seed, as indicated by its specific gravity, with abundance of saline element in the soil, you need be under no apprehension as to smut. Blight or mildew proceeds from the same cause—degeneracy of the sap. Should the season be unhealthy, thunderstorms and changes in the electrical condition of the atmosphere prevail, the crop will suffer severely unless there be a sufficiency of saline element in the soil, to antagonize the decomposing tendency of the electric fluid. The rapidity with which electricity develops the putrescent principle in the organic fibre is familiarly illustrated by its action on milk or meat; but let these be saturated with saline matter, and the effect falls on them innocuous. Sir H. Davy asserts, that wheat will not grow without lime, because lime is discovered in its composition. Had he said, without the presence of an earthy or alkaline salt, he would have been nearer to the truth. Let us see what has been the effect of the nitrite manures, as they are called—nitrite of potass (saltpetre) and nitrite of soda, applied to wheat. A correspondent in the *Farmers' Magazine*, for 1840, thus writes:—“Ten years ago, I purchased fourteen pounds of saltpetre and applied it to two stitches, or warps as we call them in Kent, of corn—one of wheat, the other of oats. In about ten days, the effect produced was distinctly visible in the deeper green colour of the corn; and, in a month, if the situation of the fields would have admitted it, the two crops might have been easily distinguished at the distance of a mile. At harvest, the corn was about a foot higher than the adjoining warp, in which no saltpetre was put. This was done about the 1st of May; the saltpetre was sown on the corn, and nothing more done to it—the land, a stiff, heavy, close soil. The following year I purchased a ton, and applied it to wheat in the month of April, and the result was equally favourable. The next year I purchased several tons, and among other experiments, applied it to one warp of wheat, being about the sixth part of an acre, doing nothing to the other part of the field. The warp with the petre was reaped by itself, and the adjoining one without petre was also reaped by itself; both were carted and thrashed separately. The warp with the petre yielded six gallons and a-half of wheat, and four trusses of straw more than the other.” So much for quantity under saline manure; now for quality. The following article appeared in a recent publication:—“In an analysis of 100 parts of two different specimens of wheat, which were grown on the same field, one of which

has been dressed with the nitrite of soda and the other not, the result was—

	<i>Wheat on which nitrate was used.</i>	<i>Wheat on which nitrate was not used.</i>
Bran - - - - -	25	24
Gluten - - - - -	$23\frac{1}{4}$	19
Starch - - - - -	$49\frac{1}{2}$	$55\frac{1}{2}$
Albumen - - - - -	$1\frac{1}{4}$	$\frac{2}{4}$
Extract, loss, and water	1	$\frac{3}{4}$
	100	100"

Thus it is seen, that the wheat so nitrated contains $4\frac{1}{4}$ per cent. more gluten, and $\frac{1}{2}$ per cent. more albumen than the wheat not so nitrated; and as it has been stated that gluten is the substance to which wheat owes its nutritious qualities, this alone would prove our position. But if we carry our investigation further, and see its results as to the real produce of bread, we shall be more convinced than ever of the value of this saline manure. And here, again, we resort to experiments made by the same distinguished professor, for an elucidation of this fact:—"Three pounds and a-half of flour made from wheat dressed with nitrate, produced four pounds fourteen ounces of bread; whilst three pounds and a-half of flour, made from wheat where no nitrate was used, yielded only four pounds four ounces of bread: thus leaving ten ounces of bread in favour of the wheat thus nitrated."

Farmer—These saline manures, then, ought, in your opinion, to supersede all others?

Writer—By no means; they ought not to be named manures at all. They furnish no more food to plants, than salt does food to man; and if they are too liberally supplied to the soil, and farmyard manure withheld, they will quickly exhaust the land, by driving every particle of nourishment from the crop. I perceive it stated, in what is intended to be a standard work on agriculture, "Jackson's Agricultural Husbandry," published in a cheap form by the Chamberses, that lime when mixed with animal manures, has a tendency to destroy their efficacy; but in the very next sentence he gives the lie to the assertion, for he says, that when lime is applied to the manure used for turnips, it prevents the ravages of the turnip fly. And why? Because it furnishes the young and tender plant with that sound food which it could not obtain from putrescent manure alone. The soil is the stomach of the plants; there their food is prepared, and the fibres of the roots absorb the sap from this alimentary reser-

voir, exactly as the lacteals of the animal imbibe the chyle from the material elaborated in the alimentary organs. A plant, then, is, as it were, but the moiety of an animal; it wants the whole digestive apparatus which the other has. The one has the means of preparing its food within itself; the other is dependent on foreign means, and must have its food elaborated for it. Should the matter thus elaborated be unsound, should the process be imperfect, we should have the same results ensuing to the vegetable as ensues on the animal, when its digestive powers become impaired. And when that all but universal distemper in the human system, termed indigestion, comes under consideration, the most exact analogy will be found to obtain between its results, as carried on in the soil and in the stomach.

Farmer—Well, there appears to be some novelty about your views. But what say you to those animals that infest the soil itself, and commit such ravages on the roots of plants—the grub, the wireworm, &c.? Are they not the most inveterate foes with which the farmer has to contend?

Writer—They are dependent for their existence on an unsound condition of the soil. The soil wants lime or some other saline compound; and whatever neutralizes that condition is the infallible antidote to them. And what an admirable arrangement is this! It might have been so ordered that the remedy against these—the most destructive foes the farmer has to fight—would be an evil to his crop. But an Omnipotent and Beneficent Intelligence presided at the promulgation of the laws which govern the animated universe; and these—unlike those which govern Great Britain's colonial empire—were framed in perfect wisdom, and work also in glorious harmony for good.

A SKETCH.

Behold yon mountain's brow—how bright
 With morning's clear refulgent light!
 The clouds of varying form and hue
 Float on the deep celestial blue:
 And fairy hands have jewels set,
 On the fringe of the purple violet.
 So dawns the day!

With noiseless tread
 The sable hunter leaves his bed,—
 For hark! the kangaroo's light leap
 Breaks on his short and catlike sleep!
 The quivering spear, with deadly aim,
 Darts through the air, and wounds the game,

Soon at Taralyas' feet it lies,
 And in a silent struggle dies.
 Lo! now the dazzled eye can gaze
 No longer on the glorious blaze!
 The sun has left his golden bed,
 His influence on the earth hath shed.
 Birds of beauty are on the wing,
 And flow'rs around their perfume fling;
 The ploughman shouts his early song,
 As he drives the patient teem along,
 And the snow-white lamb, with gambols free,
 Is seeking the shade of the forest-tree.
 The sea like a silver plain appears,
 And on it many a vessel steers;
 The skimming sea-bird hovers o'er
 Those vessels as they near the shore.
 Now basking in the noon-day heat,
 The native seeks no cool retreat—
 But in a tranquil slumber lies
 Beneath those bright and glowing skies!
 Nor sleeps alone—his constant friend,
 A thin, gaunt dog, his steps attend;
 By day, by night, that dog is there!
 His meagre meal—his bed to share!
 What mean those wild cries, loud and shrill,
 That echo from the distant hill!
 The crackling bark—the blazing tree!
 List! 'tis a grand corroboree!
 Dark forms, like demons, dance before
 The hollow trunk, the night-fires roar
 They form a ring, and stamp the ground
 With arms upraised, and agile bound;
 With measured step—see! they retire—
 Advancing then, with one desire—
 Poised on the toe, with quivering kne
 They sing their songs of gallantry!
 Each female hand now beats the time
 On the tom-toms, as their voices chime
 And, as their loobras o'er them stand,
 With arms extended, hand in hand—
 The drama closes with a cry,
 The native song's monotony!
 Rising behind Mount Lofty's height,
 The moon at full, displays her light;
 A solemn silence seems to reign
 Ere yet that orb is on the wane—
 For the natives to their wyrleys creep
 With spirits spent; in slumber deep
 They rest their wearied limbs, nor wake
 Till Sol hath gilded sea and lake!

A.B.F.

EXTRACTS FROM THE NOTE-BOOK OF
FRANK FOX PHIPPS.

MY SHIPMATES.

I HAVE long intended to give the world the benefit of my experience in the shape of a novel, in five volumes, entitled "The Victim," "The Involuntary Emigrant," "Wind and Tide," or some equally pithy and attractive appellation. On consulting a friend, however, well versed in the art of book-making, he recommended, like a skilful aeronaut, that I should send forth a pilot balloon, and see "how the wind lies," before I ventured further, to invite attention to the gaseous emanation of my brain. Without further preface, therefore, I, as a first experiment, determined to give, through the medium of the Magazine, to "my friends the public," a short extract from my note-book.

I was born—of this fact I have the most convincing proofs, but where and of whom I am at a loss to say; and, indeed, I know not that this is a matter of material interest to my readers. Suffice it to say, that at, or about the age of eighteen years, I filled the lucrative and confidential situation of dock clerk, in the respectable house of Messrs Profit & Loss, in Bishopsgate-street Within, in the good city of London—*lucrative*, for as regularly as Saturday evening came round, I received from Mr Charges, the petty cash keeper, a golden sovereign—*confidential*, for to me was entrusted the duty of showing the accommodations of the ships to the various emigrants, and of promising them sufficient advantages on the passage. My situation was no sinecure, I can assure you. Little did I think when I quietly promised poultry, fresh meat, potatoes, bottled ale, soft bread, wine, spirits, preserved fruits, cheese, hams, and pickles, with a liberality not to be surpassed—little did I think that my treachery would recoil on myself—that the victimizer would become a victim—but so the fates had ordained.

One day I was sent to Deal, to introduce a first mate to the captain of one of our ships, bound for South Australia—the officer for the voyage having "levanted." The new mate was an old chum of mine, and I had got him the berth at an hour's notice. The skipper was civil, and requested that Mr Slipknot would get ready for immediate duty. I retired with him to his bunk, to take a parting glass. I had been hard at work all day, and

4' Eheu, eheu! proculis ducentibus somnos!—

when my friend was called suddenly on deck, I stretched