believe, is a mistake, but salt and door manure seem to produce this effect.

Though the potato will thrive when otherwise in a healthy state, with raw stable manure in contact with its roots, yet there can be no question that it grows better with *rotted manure mixed through the soil.* It is probable that much of the efficacy of sea-weed, which is much used as a manure for potatoes on the sea coast, depends on the Soda which it contains, supplying the place of potash. The sea manure is thus very useful on the slaty and granite soils, which contain much potash. The lime afforded by the sea-weed is probably of more importance than the soda.

Animal manures, affording nitrogen, are also very important to the vigorous growth of the potato, as to most other cultivated plants.

As in the present state of the potato, the rot or blight is the most important subject of enquiry. We may devote some time to its consideration, and may begin by stating the leading facts as to its mode of occurrence.

1st. The general diffusion and simultaneous occurrence of the disease over extensive regions, is a remarkable fact, and the exceptions arising from the differences of soil and other causes, are also very instructive in suggesting remedial measures. Some of these exceptions will be considered subsequently.

2nd. The disease has usually attacked the crop at that stage of the growth when the tops are fully formed, and the formation and filling up of the underground tubers are most rapidly proceeding. Yet early potatoes often pass this critical period in safety, while those which are late are attacked, showing that the weather or temperature acts with or against the predisposition at this particular stage of growth, and modifies its influence.

3rd. The disease has usually first made its appearance in the leaves, and descends from these to the stems or roots. In the leaves and stems, it appears in the form of death and decay of the tissues, very similar to that which results from frost or the application of any poisonous substance.

In the tuber, its progress can be distinctly observed, and is somewhat curious. The tuber consists of a vast number of little cells or bags, filled with a fluid containing vegetable albumen and other substances in solution, and having small grains of starch floating on it. There are usually several of these starch grains in each cell. Through this cellular tissue, pass bundles of vessels or tubes communicating with the eyes or buds on the surface of the potato. The disease usually commences at the surface immediately under the skin, and usually near the eyes and penetrates inward along the bundles or vessels. Under the microscope it is seen to be accompanied by the growth of a minute parasitic fungus, analogous to that which causes mildew in wheat, though it has not been certainly ascertained whether this fungus originates the disease, or whether its growth is merely a consequence of the change of tissues. It is perhaps most probable that the development of the fungus is favored by the disease previously commenced, and it seems certain, that in some cases the disease exists without the fungus. From these it spreads to the walls of the cells, and the fluid they contain becomes decomposed and blackened, and after all the rest has been reduced to a brown, putrescent mass, the starch-grains still remain entire. It has been observed in some instances, that in proceeding from the stem to to the roots, the disease appeared first in the tubers nearest to the stem. The best general view that can be given of such a disease is, that it is a mortification of the tissues of the plant, proceeding from something which has diminished its vital energies, in such a manner as to allow those changes to go on which ordinarily would take place only after the death of the plant.

As to causes, two important truths deducible from the facts already stated, at once meet us.

1st. A disease so general and wide spread, probably primarily depends on some great, and generally operating pre-disposing cause.

2nd. Notwithstanding this, it is locally induced or prevented by the action of a great number of secondary causes, which favor or arrest its developments and which yet cannot be considered as the primary causes of its appearance. Let us inquire first into

THE INDUCING AND SECONDARY CAUSES OF THE DISEASE, AND REMEDIES OR PALLIATIVES FORMED ON THEIR STUDY.

Most of these causes it will be necessary merely to name, as the greater number of practical men are well acquainted with them. The principal are wet and undrained soils, wet seasons, wet weather, often warm and dry weather when the tops are fully grown; chilly nights succeeding hot days, rank manure in contact with the roots, want of attention to keep the crop well tilled and free from weeds; RUN-OUT SEED, long cultivated on the same farm. These and similar causes have evidently had an important influence in locally developing the disease, but *none of them can be its general cause*, since the disease often appears where all are absent and these causes were quite as general as now, in former times, without producing any such consequence as the potato blight. Some valuable hints, however, as to the best palliatives or temporary remedies for disease, can be derived from these causes in connection with the experience of farmers. Of these, the following are very important temporary remedies or palliatives.

1. Early planting, and planting early sorts, because this gives greater probability of avoiding the affects of autumnal CHILLS and rains. This remedy has been found very effectual in Nova Scotia.

2. CHANGE OF SEED, ESPECIALLY FROM POOR LOCALITIES, to richer and milder situations. The Scottish, low country, farmers have obtained excellent results by importing seed potatoes from the bleak and poor highland districts.

3. Selecting those varieties which have proved least liable to disease, and these will generally be found to be such as have been recently introduced, or lately procured from the seed.

4. Planting in dry soils and under-draining more moist soils, if necessary, to plant in them. The dry, sandy uplands of some districts have almost entirely escaped the disease, when the crop has been put in early.

5 Applying well-rotted manure and plowing it in, instead of putting it with the seed in the drills.

GUANO and composts, made with liquid manure, have proved themselves better than stable manure. This and the two last remedial agents, act by giving the plants a greater degree of healthy, general vigor, than they could derive from run-out seed, in a wet soil or in contact with rank manure.

6. Planting in new soil and disuse of mineral manures. It is generally observed, that the potato has been most healthy when planted in new, virgin soil, before the unskillful agriculturist has extracted from it, the stores of alkaline and other mineral manures remaining in it from the ashes of the forest. The composition of the ash of the potato at once explains the reason of this, as the following table taken from Johnston will show:

Ashes in 10,000 lbs. of the roots and stems of the potato.

	Roots.	Tops.
Potash,	40.28	84.9
Soda,	23.34	0.9
Lime,	3.31	129.7
Magnesia,	3.24	17.0
Allumina,	0.50	0.4
Oxide of Iron	0.32	0.2
Seilicia,	0.84	49.4
Sulphuric Acid,	5.40	4.2
Phosphoric do.	4.01	19.7
Chlorine,	1.60	5.0
	82.84	308.4

Here we have very large proportions of lime and potash, the latter forming nearly 50 per cent of the ashes of the roots. Now these substances, potash especially, are plentifully supplied to the soil by the ashes of the woods, and are usually deficient in exhausted lands. Hence, if we apply to run-out or long cultivated soil, lime, wood ashes, gypsum, (sulphate of lime) common salt, chloride of sodium, bone dust, phosphate of lime, we supply it with some or all of the more important substances in the above table, and thus assimilate it to the virgin soil in which experience proves that the potato thrives best. I have found by experience that healthy potatoes, (though not a large crop,) could be obtained by planting with no other manure than a pint of wood ashes, unbleached, in each hill, in seasons when potatoes planted with ordinary manures were blighted.

Storing in dry cellars is of the first importance, when the crop is infected. I have found that potatoes in which brown spots of disease were already formed, had the progress of the change arrested by being kept dry, and that the diseased spots dried up and lost their putrescent character.

If the disease is observed in the stalks, the potatoes should be dug at once, and if that cannot be done the stalks should be pulled out of the ground.

It is now about 250 years since Sir Walter Raleigh introduced potatoes into England, and they have been constantly cultivated during this period, as an individual plant, and have we any right to expect that such plants should be healthy? We may not know the minute changes which bring about the debility of age, but we know that such debility does overtake plants as well as animals.

Grafting and budding of fruit trees is but continuing the lives of individuals, and grafts from very aged trees of old varieties, show the debility of the parent. Hence, most of the finest fruits of a century or two ago, have degenerated and become less worthy of cultivation and have been replaced by new varieties from the seed. This seems to be one of the great laws of vegetable life. Taking this view of the matter, we should rather wonder that the potato has lasted so long than that it now fails.

We can, in truth, account for its long duration, only by taking into consideration the variety of soils and climates in which it has been cultivated, the frequent changes of seed, and the *occasional raising of new varieties from the ball.*

Mr. Editor, I fear that this letter is getting too lengthy and will therefore close it.

Yours truly,

J. H. P.

Albury, Feb. 27th, 1869.