Rotation of Crops.

Contributed to the Germantown *Telegraph* by AGRICOLA.

Experience has proved that continuous crops of the same kinds of grain cannot be taken from the same soil without a diminution in the yield; therefore, we are forced either to let the land lay idle or cultivate some other crop.

The application of chemistry to agriculture has proved that plants absorb certain substances from the soil; that different plants absorb different substances, or different proportions of the same substances.

The amount taken from the soil by different species of plants varies much; for instance, a good crop of wheat will, in straw and grain, remove from the soil 4,500 lbs., but only 123½ of this is derived from the soil; a crop of oats removes 5,250 lbs., of which 254 are from the soil; a good crop of barley will take from the field 4,300 lbs., of which 122 lbs. are from the soil; while ten thousand pounds of potatoes contain but eighty-three pounds of soil food.

All plants obtain the greater part of their nourishment from the air; therefore, if we plow down any crop while it is yet green, when decomposed it will leave the soil in a better condition than before it grew.

Plants not only absorb certain substances from the soil, but they also deposit other substances. That is, plants (or rather some plants) *take into their circulation* compound substances, and these substances they resolve into their original elements, such of these elements as are necessary to the growth of the plant are absorbed, and the others are deposited in the soil by the roots.

Nor is this confined to grain and grasses alone, but it may be applied to forest trees; thus, for instance, if a pine forest is cleared off it will be replaced by one of oak, or some other hard wood; if oak or other hard wood is cut down, it will be replaced by some soft or resinous wood. Where the pine is not common, maple or chestnut will replace the hickory and oak, and the reverse.

This is easily accounted for: the pine takes into its circulation certain compounds, part of which are needed to form its peculiar sap; these parts are retained and the remainder deposited in the soil. The crop of pine having nearly exhausted the supply of its proper food in the soil, and having placed in the soil a large quantity of substances which are the proper food for the oak or other hard wood, is removed, and *gives the oak an opportunity to* spring up and flourish on the food left by the pine.

We may crop a soil with corn until the crop will not pay for the work, and the soil will still bring a good crop of potatoes; or we may crop it with potatoes until it is exhausted by them, and it will bring better corn than before.

Old gardens often give out, or fail to produce good crops of vegetables, even with a good coat of manure. If such gardens are cropped for two or three years with potatoes without manure they will produce large crops of potatoes; and after the potatoes are taken off they will bring good vegetables.

In gardens, those crops which are cultivated for their seeds should always be succeeded by those cultivated for their roots. *In England* this is taken as a rule for field crops; thus, wheat and barley are to be followed by potatoes, turnips, etc., for stock.

The common course or rotation with farmers in this section is corn, oats, wheat (with manure and grass seeds,) and grass pastured the first year, mowed the next three or four, and then pastured until the artificial grasses (clover and timothy) begin to run out, when it is again put in with corn. Another very common plan is to cut a portion of the corn early, and seed with wheat, with a light coat of manure; as soon as the wheat is harvested the ground is well plowed, the second coat of manure put on, and the ground again plowed and seeded with wheat and grass seed, the same as the oats stubble.

Another plan, which is every year becoming more common, is to crop with corn, followed with oats; *when the oats is being put in,* seven or eight quarts of cloverseed per acre is sown with it; after the oats is harvested the clover may be lightly pastured, but is better without until fall. The next year the clover is allowed to grow until after hay harvest, (or as soon after as convenient,) when it is plowed under well; the manure is then spread, and just before seeding time the ground is again plowed, and seeded with wheat and grass seed.

Let us examine into the effects of these different rotations:

Suppose a crop of wheat to yield 25 bushels per acre: the straw will weigh (in a medium crop) twice as much as the grain: the crop would then take from the soil the following kinds and amounts of soil food:

Silicia	92.10 lbs.
Alumina	8 09 "
Lime	8.64 "
Magnesia	1.31 "
Potash	3 97 "
Soda	4.47 "
Phosperic acid	5 70 "
Sulphuric acid	1.36 "
Chlorine	1.05 "

A crop of oats of 50 bushels per acre, with the straw (two and a half times the weight of the grain,) will take from the soil, of

Silicia	166.69 lbs.
Alumina	0.43 "
Lime	6.70 "
Magnesia	1.93 "
Potash	35.61 "
Soda	2.69 "
Phosphoric acid	1.88 "
Sulphuric acid	2.66 "
Chlorine	0.40 "
Oxide of iron	0.92 "
Oxide of manganese	0.07 "

We see by these two analysis that oats takes more silicia, magnesia, potash and sulphuric acid, and less alumina, lime, soda, phosphoric acid and chlorine; it also takes two articles, oxides of iron and manganese, which wheat does not contain.

These articles are all necessary to a good crop, and must come from the soil.

By referring to these analyses we will see that oats is a more exhausting crop than wheat. A good crop of wheat will remove from the field 4,500 pounds of grain and straw; of this but 123½ pounds is taken from the soil. An equivalent crop of oats will remove 5,250 pounds, of which 254 pounds is from the soil, or 4,500 pounds of oats and straw would remove 218 pounds of soil food. The exhausting powers of wheat and oats are in the proportion of 123 to 218, or, if we take them acre for acre, in the proportion of 123 to 254.

Barley is now being, in many sections, substituted for oats in the common rotation. Let us examine the economy of this:

The soil food of a good crop of barley is as follows:

Silicia	89.97 lbs.
Alumina	3.90 "
Lime	16 04 "
Magnesia	5 37 "
Potash	10.06 "
Soda	6.92 "
Phosphoric acid	7.93 "
Sulphuric acid	3.93 "
Chlorine	2.01 "
Oxide of iron	0 30 "
Oxide of manganese	0.60 "

Barley, when compared with oats, requires more soda, lime, magnesia, alumina, sulphuric and phosphoric acid, and chlorine, and less silicia, potash, and oxides of iron and manganese; a good crop removes from the field 4,400 pounds of grain and straw, of which, 142 pounds are soil food.

If a crop of barley will bring as much or even a little less than one of oats, it may well be substituted for the latter. A large crop of barley may be produced by the application of common salt.

Chemical analysis has proved that 10,000 pounds of turnips, with their leaves, take but 245 pounds (*mostly potash, soda, and lime*) from the soil. Hence, the benefit of wood ashes and lime on turnips. The same weight of potatoes remove from the soil 390 pounds, of which 308 are in the tops; the same three substances predominate as in the turnip, hence they should never follow one another.

A crop of wheat (25 bushels,) followod by one of oats (50 bushels,) will remove 398 pounds from every acre in actual soil food.

Some of our western lands may be cropped with wheat for a long time, without any diminution in the crop.

Let us examine the following *analysis of virgin soil from the banks of* the Ohio in the State of Kentucky: 100 pounds of the dry soil contained, of

Silicia (*in the form of sand*)	87.143 lbs.
Alumina (in the form of clay)	5.666 "
Oxide of iron	2.220 "
Oxide of manganese	0.360 "
Potash	0.120 "
Soda	0.025 "
Phosphoric acid	0.060 "
Sulphuric acid	0.027 "
Lime	0.564 "
Magnesia	0.312 "
Carbonic acid	0.080 "
Humic acid	1.304 "
Chlorine	0.036 "
Insoluble humus	1.072 "

These numbers seem small, but carry them out and see how much they amount to. Suppose the soil to be one foot thick, an acre will then contain 16.560 cubic feet, each of which will weigh about 80 pounds (our common soils weigh about 87 pounds *per cubic foot,*) or *1.324.800* pounds per acre; an acre, therefore, contains, of

Silicia	115 826 lbs.
Alumina	74 052 "
Oxide of iron	29 410 "
Oxide of manganese	4 769 "
Lime	7.471 "
Magnesia	4.133 "
Potash	1.589 "
Soda	331 "
Phosphoric acid	794 "
Sulphuric acid	357 "
Carbonic acid	1.059 "
Humic acid	17.275 "
Chlorine	476 "
Insoluble humus	14.291 "

By applying arithmetic to this in connection with the analysis of wheat, it would seem that this ground contained the full materials for seventy-four crops of wheat; but such is not the case; the wheat of which the analysis is given was raised on soil which was not rich in soda; the first crop raised on the above soil would give a much larger proportion of the ingredients than is given in the analysis of wheat.

A rotation of crops will be necessary until we learn just what we remove from the soil by each crop, and can replace it in the proper form to be used by the plants.

Let us now consider the effect of a crop of corn. A crop of seventy-five bushels per acre removes (in grain) from the field 4,200 pounds, of which but fifty-two pounds is derived from the soil, in the following proportions:

Silicia	0.4 lbs.
Alumina	0.21 "
Lime	0.1 "
Magnesia	6.75 "
Potash	14.16 "
Soda	2.9 "
Phosphoric acid	26.6 "
Sulphuric acid	0.25 "
Chlorine	0.15 "
Oxide of iron	0.11 "
Oxide of magnesia	0.08 "
	51.75

The cornfodder of an acre carries from the field 374 pounds of soil food, and, therefore, the straw and grain carry off about 426 pounds of soil food.

We will suppose that the soil of each crop is returned in the manure: a crop of wheat removes (at 25 bushels per acre,) 17.66 pounds of soil food in the grain. A crop of oats (50 bushels per acre,) removes in the grain 38.70 pounds of soil food; and corn, as above stated, 52 pounds per acre.

Thus we see then, in a regular rotation of corn, oats and wheat, we remove from the soil 108.36 pounds, which we must replace in some form, or our land will not be in as good condition as at the beginning of the rotation. Nor must we imagine that 109 pounds of barnyard manure, guano, or super-phosphate, however good, will make the thing all right, for but a small portion of the barnyard manure is composed of the materials of soil food.

Here is developed the great secret of economy in manure: we place our straw, stalks and animal droppings in the barnyard; of course the air food is in the straw, and the grand secret *is to keep it in the manure.* If the manure is left exposed to the weather, the soil food being mostly soluble in water, is thus carried off; and by decomposition the air food evaporates and is carried into the atmosphere. If the manure is thrown into heaps, in a loose state, the air, by a free circulation through it, produces the same decomposition, accompanied with heat, and the air food is lost. Therefore, manure to retain its value, should be packed or tramped tightly, somewhere under shelter.

How to be a Poor Farmer.

The road to poor farming, not being generally understood, although thousands walk therein, the following way-marks from the Springfield *Republican* may be of some benefit to that class of agriculturists:

1. Invest all your capital in land and run in debt for more.
2. Hire your money to stock your farm.
3. Have no faith in your own business, and be always ready to sell out.
4. Buy mean cows, spavined horses, poor oxen and cheap tools.
5. Feed bog hay and mouldy cornstalks exclusively, in order to keep your stock tame; fiery cattle are *terrible hard on old rickety wagons and plows.*
6. Use the oil of hickory freely whenever your oxen need strength; it is cheaper than hay or meal, keeps the hair lively, and pounds out the grubs.
7. Select such calves for stock as the butchers shun; beauties of runts, thin in the hams, and pot bellied; but be sure and keep their blood thin by scanty herbage; animals are safest to breed from them that have not strength to herd.
8. Be cautious in the manufacture of manure, it makes the fields look black and mournful about planting time; besides it is a deal of work to haul it.
9. Never waste time in setting out fruit and shade trees; fruit and trees rotting around a place makes it unhealthy.

Fence Posts.—Of the many methods of preserving fence posts from decay, *none* is, perhaps, more simple *and cheap* than the one of soaking *them* in blue vitriol. At a recent meeting of the Farmer's Club, in Hudson, N. Y., one of the members exhibited a post soaked in a solution of blue vitriol, one quart of vitriol being used to twenty quarts of water. The post was pine, and when taken up was as sound as when first put down, eight years since. This solution is good for all kinds of timber exposed to the weather—spouts, shingles, stakes, bean poles, etc.

SLAVE EMANCIPATION IN THE DUTCH WEST INDIA ISLANDS.—A project of emancipation of slaves has been adopted for the Dutch Islands in the West Indies. The following extract from the Surinam *Weehblad*, of Feb. 15, indicates the chief features of the plan which has been adopted:

"The slave question in the Dutch West India colonies has been settled. All slaves in those colonies will be set free on the first of July, 1863, under the following conditions, 1. Compensation of three hundred guilders for each slave—man, woman or child—to be paid to the owner. 2. Slaves to remain under apprenticeship on the estates for a term of three years, during which time they are to be paid wages for their work, half of such wages to accrue to Government."

An English Oddity of the Last Century.

The editor of a recent edition of Lady Mary Wortley Montague's Letters gives the following account of the Earl of Pembroke, a great oddity of a hundred years ago:

Marrying for the third time at 75, he maintained strict dominion over a wife, whom other people thought safely arrived at years of discretion, and quite fit to take care of herself. She had leave to visit in an evening, but must never, on any account, stay out a minute later than 10 o'clock, his supper hour. One night, however, she stayed till past 12. He declined supping, telling the servants it could not be 10 o'clock, as their lady was not come home. When at last she came in a terrible fright, and began making a thousand apologies, "My dear," said he, very coolly, "you are under a mistake, it is but just 10; your watch, I see, goes too fast, and so does mine: we must have the man to-morrow to set them to rights; meanwhile, let us go to supper."

His example on another occasion might be worth following. Of all the Mede-and-Persian laws established in this house, the most peremptory was that any servant who once got drunk should be instantly discharged, no pardon granted, no excuse listened to. Yet an old footman, who had lived with him many years, would sometimes indulge in a pot of ale extraordinary, trusting to the wilful blindness which he saw assumed when convenient. One fatal day even this could not avail. As my lord crossed the hall, John appeared in full view; not rather tipsey, or a little disguised, but dead drunk, and unable to stand. Lord Pembroke went up to him: "My poor fellow, what ails you? you seem dreadfully ill—let me feel your pulse. God bless us, he is in a raging fever; get him to bed directly, and send for the apothecary." The *apothecary came, but not to be* consulted, for his lordship was a physician-general in his own family, but to obey orders—to bleed the man copiously, clap a huge blister on his back, and *give him a powerful dose of physic.* After a few days of this treatment, when he immerged weak and wan as the severest illness could have left him, "Hah, honest John," cried his master, "I am truly glad to see thee alive; you have had a wonderful escape though, and ought to be thankful—very thankful indeed. Why, man, if I had not passed by and spied the condition you were in, you would have been dead before now. But John! John!" (lifting up his finger,) "*no more of these fevers.*"

Nervousness and Oratory.

According to traditions, despite the majestic self-possession Lord Macaulay truly ascribes to the tenor of his life, Mr. Pitt was nervous before rising to speak; hence, perhaps, his recourse to stimulents. A surgeon, eminent in Brighton, some years ago told me that when he was a shop-boy in London, he used to bring to Mr. Pitt the dose of laudanum and salvolatile which the great statesman habitually took before speaking. The laudanum perhaps, hurt his constitution more than the port wine which he drank by the bottle; the wine might be necessary to sustain the physical spirits lowered by the laudanum. Mr. Fox was nervous before speaking; so, I have heard, was Lord Plunket. A distinguished member of the Whig party, now no more, and who was himself one of the most sensitive of *men, and one of the most attractive of orators,* told me that once in the House of Commons, he had crossed over to speak to Mr. Canning, on some question of public business, a little before the latter delivered one of his most remarkable speeches; and on taking the hand of Mr. Canning extended to him, he exclaimed, "I fear you are ill, your hand is cold and damp." "Is it?" replied Canning, smiling, "so much the better: that shows how nervous I am; I shall speak well to-night." Mr. Stapleton remarks how perceptible to those familiar with Mr. Canning was the difference in his aspect and manner before and after one of his great orations; and a very clever French writer upon the art of oratory *compares the* anguish (*angoisse*) *which* oppresses the mind of a *public* speaker while burdened with the sense of some great truth that he is charged to utter, with the joyous elation of spirit that follows the relief from the load.—[Sir E. B. Lytton in Blackwood's Magazine.

THE LAST MOMENTS OF GENERAL NEIL.—Who can reflect, without sadness, on the closing moments of the gallant Gen. Neil? His lifelong dream had been to obtain the little baton and ribbon of Marshal of France. He could not sleep after seeing it conferred on McMahon, as a reward of valor in the battle of Magenta. Before the next engagement he told his friends that this time he would win the prize he so much coveted. The conflict was over, and they sought him anxiously on the gory field. They found him almost crushed beneath his dying war horse, and the practiced eye of the surgeon told him that life would soon be over. Word was sent to the Emperor, who quickly arrived, and taking from his own breast the badge of the Marshal of France, he placed it above the heart of his faithful follower. The lifelong dream was realized, and with a single throb of exultant joy and gratitude, he threw his arms about the neck of his sovereign—the next instant he fell back in the embrace of a stronger King.

—"Bob, is that dog a hunter?" "No, he's half hunter and half setter—he 'hunts' bones when he's hungry and 'sets' by the fire when he's satisfied."