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No. 38.

Relation of Plants to the Soil.

MINERAL CONSTITUENTS OF PLANTS.—The mineral substances which plants obtain from the soil are known by analysis of the ashes which they yield on combustion.

AGRICULTURAL CHEMISTRY.—The mineral value of guano lies principally in the ammonia and phosphate of lime which it is capable of yielding to plants.

ARTIFICIAL AMMONIA.—The constituents of the ammonia which we purchase in the form of guano at so great expense and bring from distant regions of the earth, exist in unlimited quantities at our very doors.

USE OF VEGETABLE MATTER IN SOILS.—The wood, leaves and twigs of which vegetable matter is composed, furnish, in their gradual decay, the potash, silica, and other constituents of their own skeletons to form the framework of new plants.

ADDITION OF VEGETABLE AND ANIMAL MATTER.—The addition of more of this material to the soil, in the form of peat or muck from swamps, is of great advantage, because it increases the supply of the two important classes of materials which have been mentioned.

EFFECT OF ASHES ON SOILS.—Potassa or soda applied in the caustic state, or as carbonates, have entirely analogous effects on the soil.

COMPOSTS.—Composts consist of vegetable and other matter, heaped together for fermentation and partial decay in order to prepare them for application to the soil.

USES OF THE LIME.—The lime in soils, beside serving directly as a building material for all forms of vegetation, is the key which unlocks other treasures of the soil and supplies them, also, to the growing plant.

DIFFERENT VARIETIES.—The quality of guano differs materially, according to the source from which it is derived. The ammoniacal salts, on which its agency as a fertilizer principally depends, being soluble in water, the product of

other solvents of the soil, they are inaccessible to the plant.—Lime has the property of forcing itself into the rocky prison of every such insoluble grain, and setting part of its inmates at liberty.

ACTION OF LIME ON MINERAL MATTER EXPLAINED.—The action of lime, which has just been mentioned, is a simple consequence of its basic properties. It takes possession of part of the silicic acid of the alkalio silicate in the rocky grains.

ACTION OF LIME ON ORGANIC MATTER.—Lime has another important effect on soils, in hastening the decomposition of their organic matter, and thus, indirectly supplying in large quantity, valuable materials, before mentioned, which these are adapted to furnish.

EXHAUSTION OF SOILS.—When soils become exhausted of those substances which form the mineral food of plants, the growth of vegetation ceases. It is never absolute, but consists in a great reduction of that portion of their material which is in a condition to be appropriated by the growing plant.

DEFICIENCY OF ONE OR MORE CONSTITUENTS.—The comparative exhaustion of some one or more of the constituents of the soil is a much more frequent occurrence. It is commonly the result of the cultivation of the same crop during many successive seasons, and the consequent reduction of those materials which the particular plant requires in largest proportion.

MAINTENANCE OF FERTILITY.—The effect of decomposing animal matters on the soil has been already considered. They return the very material which was abstracted from the soil, with the addition of nitrogenous matter originally derived from the air by the growing plant.

GUANO.—Guano consists of the accumulated droppings of birds, and is principally obtained from certain rocky islands on the coast of South America. In these haunts of the heron, flamingo, and other sea-fowl, it is accumulated, in some instances, to the depth of a hundred feet.

"SUPERPHOSPHATE OF LIME."—The method employed in the manufacture of "superphosphate of lime," has been already given in the Chapter on Salts. As in the case of guano, its agricultural value depends on actual or potential ammonia and phosphate of lime. In proportion as the phosphoric acid is in a soluble form, the value is much increased.

In Texas, a sister's bean is called a brever, brother-in-law.

most climate is of comparatively little value. The best is obtained from the coast of Peru, where rain seldom or never falls.

AGRICULTURAL VALUE.—The agricultural value of guano lies principally in the ammonia and phosphate of lime which it is capable of yielding to plants.

ARTIFICIAL AMMONIA.—The constituents of the ammonia which we purchase in the form of guano at so great expense and bring from distant regions of the earth, exist in unlimited quantities at our very doors.

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The Two Thinkers.

In one of the villages of the Newcastle coal-mining region was the humble dwelling of a very humbleman. The little, old-fashioned kitchen was the home and study of a very poor man, of whom the world then knew nothing, but has since known a great deal.

One of the complaints was flooded with water. The engine had been frantically pumping for nearly twelve months, and came to be regarded as a total failure.

On Saturday afternoon he went over to examine the engine more carefully than he had done before. One of the men asked him, "Well, George, what do you make of her?"

"What do you know about engines?" cried the man scornfully. But the superintendent, hearing of it, determined to give George's skill a trial.

How did he do it? He was not bred an engineer. He had no books to teach him. It was because he was a thinker.

His little son is interested in all that interests his father, and his father explains to him pretty much all he knows.

He had while making the calculations necessary to adapt the dial to the latitude of Killingworth. But at last it was done, and we made a very respectable dial of it.

Would you know what all this led to? It laid the track of the first railroad and built the first locomotive.

George Stephenson, who drove the first steam horse the world ever saw; and his son is Robert Stephenson, who planned the largest bridge in North America, that over the St. Lawrence River at Montreal, called the Victoria Bridge.

No beginning could have been less promising than that of George Stephenson. Born in a poor condition, yet rich in spirit, he was from the first compelled to rely upon himself.

You may go to school, boys, and read ever so many books, but unless you learn to think, you will never be able to turn your knowledge to any good or great account.

The Fortifications.

The failure to carry the fortifications of Paris at once must, it seems to me, prove highly disastrous. The French capital is a fortified city of the first order.

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protected, is a circular railway, by which the French could throw large bodies of men upon any given point in a very short space of time, and with its aid the effect of sudden sallies, nearly always successful for the time, is greatly increased.

It is an interesting question to consider how near the enemy may come, and what defensive advantages may be gained by the series of detached forts beyond the circle of fortifications proper.

China advances through Russia are unfavorable. The Chinese are preparing for war. Further outrages have been committed on missionaries.

The King to the Queen, Sunday night: "The citadel of Laon exploded after surrender, just as the Prussians were preparing to enter.

ROME, September 13.—Immense posters have been stuck up on the dead walls proclaiming an universal Italian republic.

PORTLAND, MAINE, September 13.—One hundred and fifteen tows give Porham 5,242 majority—a Republican gain of 168.

BANGOR, MAINE, September 13.—The Democrats are rejoicing over their first majority in this city.

SAN FRANCISCO, September 13.—The Oregon Legislature has been organized. The Democrats fill all the offices.

THE CUIRASSIERS' LAST CHARGE.—McMahon had already lost the battle. We must keep charging, *mes enfans*," said the Duke, turning to the Colonel and the few around him.

THE SINKING OF THE IRON-CLAD THE CAPTAIN.—This immense English ship, the finest afloat, went down to the caverns of the deep, with nearly all her crew.

Napoleon is accompanied in his exile by Gen. Castelnau, the Prince de Moskova, and Counts de Genlis, de Wauvert, Reille, and Pajol, all of his personal staff.

General Comander-in-Chief.

LONDON, September 13.—Bismarck's official report to the King, dated September 2, describes his interview with Napoleon, at Sedan. Napoleon wanted better terms of capitulation than the Germans offered. Bismarck refused to discuss the subject, as it was a military question but was willing to discuss terms of peace.

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ADVERTISING RATES.

Advertisements inserted at the rate of \$1.50 per square-inch for first insertion, and \$1 for each subsequent insertion.

Legal Intelligence. [From the American Law Times for September in advance of publication.]

In our State Courts Reports for the present month will be found a number of adjudications of unusual interest.

The nature of the writ of mandamus, a remedy which is becoming more and more useful, is ably discussed in the case of *The State ex rel Townsend et al. v. Meiser, &c*, and a decision arrived at which will gratify not a few of our readers.

The effect of a partner signing with a seal the firm name to an judgment contract is discussed by Judge Shawkwood in *Schmeitz v. Shreeve*. The Court held that if the contract be good without the seal, the latter may be rejected as surplusage.

In *Gates v. Preston*, adjudicated in the Court of Appeals of New York, will not, we apprehend, seem conclusive to all who read it although a careful examination will show that it is good law. A judgment of a Justice Court, obtained by a surgeon for professional services, is held to be a bar to an action for malpractice in the performance of such service.

In *Detroit v. Blakely* a doctrine is enunciated which is directly in contravention of what has been very generally accepted as indisputable. It is declared that a city cannot be held liable for a personal injury resulting from a defect in its streets. The ruling will appear most unusual, and yet the reasoning and interpretations are as lucid as they are bold.

What may be the effect of this remarkable opinion remains to be seen. It is not improbable that it may prove to be productive of great results.

The opinion of Chief Justice Chase in *Hood v. Talley*, defining the responsibility of officers who have invested in Confederate bonds, is one of the most important delivered since the close of the war.

In *Bigger v. Waller et al*, the case of *Hanger v. Abbott, and Ward v. Smith*, are construed, and the rule laid down that as a general principle interest does not accrue between belligerents, although in some instances it may.

From the recent opinions of the Supreme Court we give the cases of *Niel v. Neal*, and *Byrd v. Forrest*.

In the former it is decided that when there is a parol gift of land accompanied by possession, and the donee makes valuable improvements, specific performance will, upon proper proof, be decreed.

*Bigelow v. Forrest* treats of the removal of actions under the act of 1863, declaring that this act relates only to actions which are strictly personal.

The Turcos in the French army cut off heads and gouge out eyes. Perfect devils, says an intelligent German.