THE GEOLOGICAL HISTORY OF NORTH AMERICA.

BY DR. STEVENS.

Second Lecture.

I stated last week that at the commencement of the geologic record the only portions of the continent of North America that were above the water were Labrador and a few rocky knobs, including the Adirondack Mountains, the peaks of the Alleghanies and others which I described. These formed barren islands in the midst of the lifeless ocean. The rocks that were formed before the creation of animal and vegetable life upon the earth are called the azoic rocks from the Greek negative, *a*, and *zoe* life. I purpose this evening to describe more particularly the constitution of the azoic rocks.

The oldest of all rocks is granite. When the first islands raised their heads above the level of the sea, the bed of the ocean between and around them was a mass of granite. As the waves dashed against the base of the hills they wore the rocks away, and fragments fell down into the sea, forming the second rock in our series. We find that the rocks next above the azoic granite are slates; mica slate, clay slate, chloritic slate, &c. From the fact of these rocks being formed in layers or strata, we believe that they were deposited from water. Those at the bottom and nearest the hills are generally, and I believe always, composed of coarse fragments of the hills, the fragments becoming finer as the distance from the hills increases. The strata too becomes thinner as we receded from the hills. The upper slates are finer than those beneath them. Those at the immediate foot of the hill generally conform to the slope of the hill, and as the formation extended into deep water it was deposited upon the level floor of the ocean.

You may ask me how I know this. These ocean beds have been raised up and have become dry land, rivers have run across these formations for ages, and have cut their way hundreds of feet down through all the strata to the granite bed. It is only necessary to ride along the valleys of these rivers to see the exact order in which the several strata were deposited one upon another.

I will describe briefly the valuable minerals which are found in the azoic rocks. The most important of these is magnetic iron ore. This peculiar ore of iron is found in the azoic rocks in great abundance, and it is found in no other formation. Red hematite, or the sesquioxide of iron is found in this formation and in several others. The same is true of plumbago. I have specimens here of these minerals, all taken from the Adirondack Mountains. The plumbago and the magnetic iron both came from the same farm. These three are the only valuable metals which are found in the azoic rocks in sufficient quantity to pay for working. Gold, silver, lead, and, indeed, nearly all of the metals are found in small quantities, but none of them in sufficient abundance to be profitably mined.

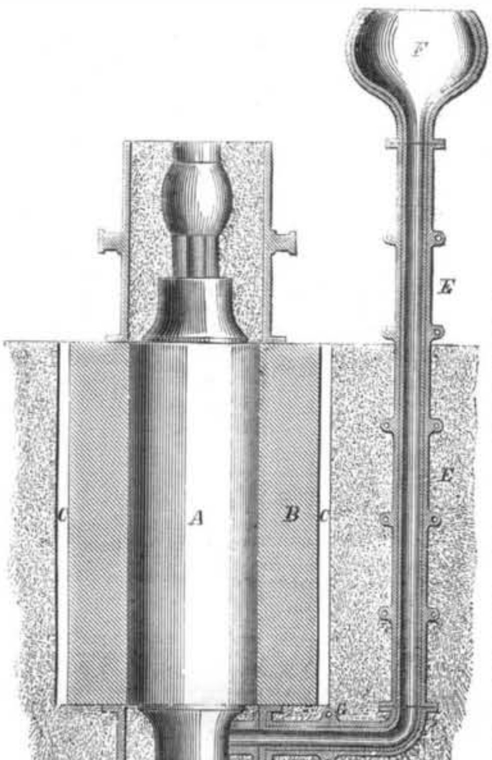
This finishes our hurried survey of the desolate portion of the history of our continent. In the next lecture I shall come to that great epoch when the Spirit of God brooded upon the waters, and life was born.

Not too Much at Once.

Sir Edward Bulwer Lytton, in a recent lecture in England, said :—"Many persons seeing me so much engaged in active life, and as much about the world as if I had never been a student, have said to me, 'Where do you get time to write all your books? How on earth do you contrive to do so much work?' I shall surprise you by the answer I make. The answer is this : 'I contrive to do so much by never doing too much at a time. A man, to get through work well, must not overwork himself ; or, if he do too much work to-day, the reaction of fatigue will come, and he will be obliged to do too little to-morrow.' Now, since I began really and earnestly to study, which was not till I had left college, and was actually in the world, I may perhaps says that I have gone through as large a course of general reading as most men of my time. I have traveled much, and have seen much ; I have mixed much in politics, and the various businesses of life ; and in addition to all this, I have published somewhere about sixty volumes —some upon subjects requiring much research. And what time do you think, as a general rule, I have devoted to study—to reading and writing? Not more than three hours a day ; and when Parliament is sitting, not always that. But then, during these hours, I have given my whole attention to what I was about."

IMPROVEMENT IN CASTING ROLLERS FOR ROLLING MILLS.

Le Génie Industriel says that in casting the cylinders for rolling mills, the mold is frequently broken in consequence of the unequal transmission of heat through its different portions. To remedy this evil the Society John Cockerill has invented the plan illustrated in the annexed cut, for which they have obtained a patent in Belgium.



The mold, B, with the space, A, for the casting, is placed in a vertical position as usual, and round the outside of the mold is formed the annular space, C, to be filled with cast iron immediately before the casting of the cylinder. This heats the mold from the outside as well as from the inside, and thus prevents it from breaking. The metal is poured into the funnel, F, and passing through the vertical pipe, E E, and horizontal pipe, G, enters the mold by the lower journal, D.

Dropping the Final Vowel.

[From the American Journal of Photography.]

Voltaire used to say that language was invented to conceal the thoughts of men. Lawyers, politicians, and many theologians practically illustrate the dictum. Mathematicians, and other men of science, however, who have ideas worth communicating, and moreover have a policy and practice of telling precisely what they conceive to be true, look upon the matter in quite a different light. They have seen the unsuitableness of ordinary language for their purpose, and have found it worth while to create a speech for their peculiar use. The botanists, conchologists and ologists generally, have adopted a great deal from the dead languages, for the reason no doubt that what is so very dead as Latin and Greek cannot change.

The chemists in the latter part of the eighteenth century made a new language for their new science—the nomenclature the most perfect of its sort of anything ever conceived. The most perfect, yet still in future to have its revision and finish. It has come only gradually into use. Even at the present day the doctors, who of all men know better and ought to set a better example, are still using some of the outlandish names of things coined in barbarian times, and they have been slower than most other men in adopting obvious improvements in the modern system.

Photographers, however, may congratulate themselves that they have learned and used the most suitable names for the chemical substances with which they are concerned. While the doctor still talks of his hydriodate of potash, and hydrosulphuret of ammonia, the photographer with scientific preciseness knows only of iodide of potassium and sulphide of ammonium.

There are other improvements still to be made in the chemical nomenclature. Let us, photographers, be first to adopt or possibly to propose them.

One of the improvements some day, and we believe shortly to be adopted, is the dropping the final e in the words of which the last syllable is ide. The advantages of such a change are the securing a more uniform pronunciation, and the removing the ambiguity to the eye and ear, which is created by the present similarity to the common termination ite. There ought to be a greater distinction between sulphite and sulphide, chlorite and chloride, than the letters t and d. The dropping the e in ide easily and evidently cures the whole evil. Bromid, iodid, sulphid, &c., are comely to our eye and ear for there is a truthful reasonableness about them.

Now, what say you, brethren editors, and men of business? What says the editor of the SCIENTIFIC AMERICAN? If we all agree our agreement is law.

The subject of improvement is not original with us. It is already adopted in *Silliman's Journal*, and in some of the school books. It needs only the sanction of those who approach nearer to the practical affairs of life. Let us have an expression on the subject.

Tan-Bark Fuel.

How often do we not see spent bark in tan yards, piled up in heaps as useless? These masses not only rot and consume themselves by their internal decay and heat, but they communicate their corruption to the tubs, vats and barrels standing near to, or touching them, with other evils too numerous to mention. It has often been discussed, and many have racked their brains to discover how tan fuel might be converted into manure ; this appears to me precisely like employing good wood shavings for manure, instead of using them as fuel. I am firmly convinced that the ashes of a lot of tan fuel are better, and give more manure, than the same quantity of tan employed as a manure immediately after having been used. In order to increase, or to obtain the entire heat of the tan, it should not be allowed to lie in large heaps, or to form into balls ; in the latter case it becomes hard in the center and consequently is less easily consumed. Neither is tan, freshly taken from the ooze vat, of much burning power, even if immediately and carefully dried ; it should be arranged in low heaps, from two to three feet high, and not large in area. In a large tannery these tan beds naturally require considerable space, as the tan must be piled loosely, and not packed together. Tan prepared in this manner, is perfectly adapted, without any admixture of wood, not only to furnaces, but also to heating stoves and fire places. Instead, however, of the ordinary bar grate, a grate perforated with holes like a sieve must be used. The heat of a flame is most concentrated at its extremity, and as the small holes allow it to expand uniformly, separate flames burn and fork through each of the grate openings or holes. In order to enable the necessary quantity of oxygen to be supplied, the fire place should be elevated at least two feet from the floor. This will heat a large-sized boiler in half an hour, while with wood fuel an hour and a half would be required.

[The above has been translated from the German by F. Reuchlin, for the *Shoe and Leather Reporter*. It is stated that the ashes of tan bark are superior to the bark itself as manure. We have seen an experiment tried to prove this, and the result accorded exactly with the above statement. Wet tan bark is used for fuel under boilers in most of the tanneries. We have seen the bark piled up in some cases upon the brick work of the furnaces. This is a bad practice, as it tends to keep the furnaces cool. Grates perforated with holes, instead of furnace bars, have long been used in America for burning sawdust and wet tan-bark. We have been informed by one tanner who has tried to economize fuel by using the tan bark as it came wet from the vats, that he failed to realize any benefit from it. The only saving which he was able to secure in burning spent bark, was by having it wheeled out into the yard and dried by the sun and wind. The solar heat which evaporates the water from bark costs nothing. The steam given off by wet bark in a furnace, we have been told, takes up as much heat as is obtained from it in burning, and that there is no economy in thus using it.—EDS.

IT is stated that the Sheffield tool makers have lately turned their attention to manufacturing several tools that had been previously made in America for the Australian market, and that they have been successful in supplying that distant market. Some new improvements are wanted by American inventors to retake the Australian tool trade.