

## MISCELLANEOUS.

(For the Scientific American.)

## Geology of the Lead Mines.—No. 2.

At points on the Wisconsin, the Blue Limestone is very thin, and in many places entirely wanting. The upper magnesian rests on the sandstone, which is about forty feet thick, and that rests upon alternations of magnesian and sandstone. One hundred and eighty feet underneath these is the lower magnesian rock, one hundred and ninety feet thick, disappearing under the river, and fully developing itself at Prairie du Chien, two hundred and thirty feet thick, resting on sandstone. It will thus be seen that this district is on a secondary formation—that we are under the coal—that we are in an upper strata of lead bearing rock, and separated from a lower one by from 50 to 200 feet of blue lime and sandstone, and that the lower magnesian limestone is thicker than the upper, and nearer the primitive rocks; consequently, there is every reason to believe that the heaviest bodies of mineral are yet below the range of our present surface mining. And these mines, so far from being exhausted or "petering," cannot be said to be opened, when compared to the depth to which mining is carried in England.

Mining, in no instance, has ever been carried here to a greater depth than one hundred and twenty-five feet; the usual depth is from thirty to seventy. Yet have these mines produced, in the last ten years, six millions two hundred sixty-nine thousand pigs of lead, weighing forty-three millions eight hundred and eighty thousand pounds, which have been sold for upwards of thirteen millions of dollars.

The State of Illinois has appointed, as Geological Surveyor, Dr. Norwood, who, we believe, was formerly associated with Dr. Owen in a partial survey of Wisconsin. He is fully competent to fill his appointment. We would like if our friends in Wisconsin, could be induced to give Dr. Owen a similar one, and thus procure a full and detailed account of the mineral wealth of that State. Should they do this, and a simultaneous survey be made of the district to which this brief and partial sketch refers, we feel well assured it would be the best expenditure ever made by the State.

When we consider the manner in which mining is carried on in this section; the considerable depths to which our shafts have been worked, and the amount of mineral produced; we are compelled to admit the correctness of the opinion expressed by Doctor Owen, in 1840:—"This lead region is decidedly the richest in the known world." It is true that the produce of our mines is not now as great as it was in 1847, when the amount shipped was fifty-four million of pounds of lead, and it is also true that there has been a gradual decrease since. But this is not owing to deterioration in the productiveness of our mines, but to a number of causes, that have operated against this kind of productive labor.

We are aware that one class of persons attribute the decrease in the quantity of the lead now made, to the political scape-goat that bears the accumulated sin of decline, in all the productive and manufacturing interests of the nation—the Tariff. Another to "scarcity of mineral," or, in other words, unproductiveness in our lodes. Neither of these, do we think, is a correct view of the case. The first proposition we turn over to the editor of the New York Tribune; the second we say has no foundation, and we do not hesitate to assert, and the facts will bear us out, that there are new lodes opened within the last nine months, producing as much or more mineral than any heretofore worked. Levin's, Potwine's, Comstock's and Turner's lodes are referred to. But it is to causes other than these, that it is due. One is, that the mineral lands and the system of mining, has changed since 1847. The lands from being the property of the Government, (we might with truth say the public) have passed, by purchase, into the hands of individuals. Formerly a miner could range through the whole extent of mineral region, and wherever he found a piece of 'vacant ground,' commenced 'prospecting.' Should he, after a few day's labor, find 'gravel mineral,' or other indications of a 'good prospect,' he continued, if not, he shouldered his

pick, shovel and rope, and sought a more favorable location. Numbers of persons were then mining, who 'farmed it' during three-fourths of the year, in the adjoining counties, and visited the mines in winter, to 'make a raise.' The 'sucker holes,' in all parts of the mines, were the work of this class; and a very large amount of mineral was thus 'raised' and thrown into market. This source has been entirely cut off.

The 'prospector' has abandoned the field and left his vocation to the regular miner; very many of these last, since the discovery of gold in California, have left our mines. The occasional return of an old lead miner, with an amount of gold, that at best is but a fair compensation for time, expenses and privations, incurred during his trip, has had its influence, and induced others to seek the land of promise, and abandon a certainty of at least a comfortable living, for the chance of a fortune in California. These are among the true reasons of decline. We are only in want of three things to raise our standard of productions far above any point which it has yet reached: they are capital, coal, and miners. The first is slowly but surely accumulating among us. The second, if ever the Central Railroad gets into operation, crossing, as it will, the Great Illinois Coal Field, will be enabled by the trains, to furnish us with any amount of coal equal to the demand, at prices that will enable us to work our mines as they do in England—make machinery supply our deficit in manual labor. Situated as we now are, our mining may be compared to unaided individual labor, as contrasted with that of united effort, combined with capital. Here we mine at depths nowhere exceeding 125 feet, and there is no single adit in these mines, 500 feet long, neither will the combined excavations of shafts, drifts, or levels, in any mine that we know of, reach 1,000 feet. Now, compare these facts with what is done in the same department of industry in other lands. The engine shaft in the United and Consolidated mine in Cornwall, reaches a depth of 1,650 feet; the length of the combined excavations reach sixty-three miles. The mine of Valencia, in Mexico is 1,860 feet deep. The Sampson mine in the Hartz, 2,197 feet. A mine near Freyburgh, in Germany, 1,944. In an article published last July, in the Mining Journal, London, the writer, in discussing the formation of mineral lodes, says:—"Are there mines worked in Cornwall profitably beyond six hundred feet?" I answer yes; and give him the names and localities of twenty-two paying mines, all of them are six hundred, and many of them are over twelve hundred feet deep. In mine Wheal Vo, they had a smithery 1,080 feet below the surface. In the Dalcoth mine, the engine shaft is fifteen hundred deep. Compare these with our mines, and how insignificant do ours appear. But not so our products: for in these we are far ahead of any yet opened. We have not a single steam engine in operation on any mine in our district. A single horse, or at most two, employed in pumping, is all that can be found with us. The first steam engine employed in mining, was in Cornwall, between 1710 and 1714; now, according to accurate returns and estimates, the steam power employed in mining in Great Britain is performing the labor of seven hundred and fifty thousand men.

Give us cheap fuel, let the iron horse bring us coal from the bed that we know to be inexhaustible; then will commence a new era in our mining; with the steam engine at work upon our lodes, we will see our staple increase, with far more rapidity than it has declined.

E. H. B.

Galena, Ill.

## Academy of Sciences in Paris.

Lord Brougham recently read at the Academy, before a most crowded auditory, a paper on the optical and mathematical inquiries which have occupied his time during his late residence at Cannes. His lordship accompanied the reading of this memoir with numerous demonstrations on the board, and for upwards of an hour occupied the attention of his hearers. MM. Arago, Biot, Tenard, and other eminent scientific men were present, and appeared deeply interested in the explanations of their learned confrere.

## Copyrights and Patents.

"In reference to copyright, it has long been extended to twenty-eight years, with the right of renewal for fourteen years longer. This was found necessary to give adequate protection to authors, and ought not to be denied to inventors, for they have been at least as useful to the country."—[C. M. Keller on the Woodworth Patent.

The above enunciation of a doctrinal point in law, demands the scrutiny of those who have studied the principles of law. Mr. Keller is a lawyer, and has been admitted to practice in the United States Courts. The same doctrine, with additions, has been propounded before, by a lawyer, too, in the American Institute. If lawyers are not acquainted with the principles of law, they should be, and if they are ignorant of them, where shall we look for correct information on the subject. It is a fact, however, that many of our lawyers are not acquainted with the principles of jurisprudence, but merely with the practices of courts, and have a knowledge of arranged facts—the laws as printed, and decisions rendered in disputed cases. This knowledge, useful and necessary though it be, is not enough to make a counsellor of the first quality, because a knowledge of principles is the only kind which enables a lawyer to make true comparisons—draw correct similes. The absence of this knowledge is evident in the extract from Mr. Keller's long document on the subject of the Woodworth Patent Renewal. There is no similarity between a patent for an improvement on machinery, and a copyright for a book. Speaking scientifically, if the conditions of the two rights (copyright and patent) were the same, the comparison would be correct; but the conditions of the two rights are radically different. The value of a copyright depends much on the style of the author—which no man can imitate. A historian may write a history to-day, and secure it by copyright, another may write one next year and use all the facts in the other history, and yet the copyright of the first would not be violated in the eye of the law. We have "Marshall's Life of Washington," and "Sparks Life of Washington;" we have "Hildreth's History of the United States," and "Bancroft's History of the United States,"—both are copyrights, but does one infringe the other? No; the law of copyright allows free scope to literary genius, and shackles it not. Would Mr. Keller be willing to allow the Woodworth Patent to be tested by the law of copyright? I trow not; for two authors may get up books essentially alike, and get them copyrighted on the same day, and yet the one would not infringe upon the rights of the other—the two would be allowed to sell their books for the twenty-eight years. But is it so with patents? No; patents sometimes do great injustice to some men, for two inventors may invent a like improvement unknown to one another—they may be living a thousand miles distant, and yet the one who can prove that he made his invention seven days—yea, one day—before the other, in the eye of the law, is entitled to the patent, and receives it. The other inventor is, by this law, deprived of the use of his own invention for 14 years—it is a great injustice to him, but it is an act of national policy, and one which was enacted for the encouragement of art and science; such an act of injustice could not be perpetrated in the case of a copyright.

Mr. Keller, in his zeal for his client, makes a comparison which is wrong in essence and principle, as one to guide us in deciding on the principle of a patent for an invention. The very nature and use of an invention, too, is radically different from that of a book. An inventor may use his invention in secret, and do a most profitable and extensive business, but a book is the thing produced—it cannot inure to the benefit of the author by any secret use—not even the copyright of a play, for the value of it depends on its popular effect. If there were no patent laws at all, no man's natural right would be invaded, for every man could use his own improvement profitably in secret; but it would be far otherwise with the book of an author.

It is well known to the Patent Office, and no doubt to Messrs. Munn & Co., and C. W. Keller, also, that two, three, and four inventors, have applied for patents about the sam-

time, all for the same thing, and that the patent has been granted to one of them because he proved to be a little in advance of the rest. The invention as a natural right, belonged to each one, for it was the creation of his own mind, and was reduced into practice by his own hands. Our patent laws are not founded in equity altogether—they are laws of policy, and, as such, I think highly of them; but the conduct of Mr. Keller, and the heirs to the Woodworth patent, if persisted in, will, I have no doubt, be the means of abolishing them entirely in less than twelve years from the present date. The New York Daily Times advocates this now. Inventors and patent attorneys should be exceedingly careful not to be too exacting; such conduct, in the working of events, generally defeats itself in the end.

JUNIUS REDIVIVUS.

## Cause of the Burning of the Amazon.

Lord Dundonald has written a letter to the London Times, in which he ascribes the melancholy loss of the Amazon to the over-working of the engines and the boilers, for the purpose of effecting a superior passage. The heat thus generated had evolved resinous gas from the new pine planks, and hence the disaster.

The opinion of Lord Dundonald is worthy of great consideration. He is one of the most shrewd, observing, and ingenious men in the world.

## A Good Water Wheel.

MESSRS. EDITORS—We are using a grist mill, the stones being 30 inches diameter, driven by an iron wheel 35½ inches diameter, using less than 60 inches of water under a head of 10 feet and 2 inches, that grinds 20 bushels of oats, or from 10 to 15 bushels of corn per hour. The mill is from the works of J. H. Burrows, of Cincinnati. The wheel is not under the influence of a patent, so far as I know. No mill in this vicinity, that I know of, will grind so fast or any better.

D. EDWARDS.

Little Genesee, Albany Co., N. Y.

## Wreck of the U. S. Steam-Frigate Missouri, at Gibraltar.

A letter from John E. Gowan, Esq., the contractor for removing the remains of the U. S. steam-frigate Missouri, dated Gibraltar, Jan. 14, states that all the machinery has been removed, except the shafts, which would be taken out in the spring. The light which has been kept for eight years over the wreck has been dispensed with. He further says that he did more in three weeks in removing the steamer than the English accomplished in three years.

## Hobbs's Locks.

The triumph of Day & Newell's lock is complete. It is said there is a great demand for the locks in England, and that Mr. Hobbs remains in London as a permanent agent. Not only has the lock been placed upon the vault and doors of the Bank of England, but the British government are negotiating with Mr. Hobbs to have these locks put on all the public vaults throughout Great Britain; and furthermore, that of all the locks exhibited at the World's Fair, most, if not all, supposed to be invulnerable, this was the only one that was not picked.

An English paper states that "Mr. Hobb's was in Liverpool a few days ago, and picked the lock of Mr. Wm. Brown's safe, by way of experiment, in a few minutes." At a meeting of the Liverpool Architectural and Archaeological Society, the Secretary stated, in reference to Mr. Brown's lock, that Mr. Hobbs had not intended to pick it, but that he had unintentionally done so while he held it in his hand.

## Dr. Kane's Lectures.

Dr. Kane, who accompanied the Grinnell Arctic Expedition in search of Sir John Franklin, delivered his two lectures in this city last week. They were well attended and gave great satisfaction. Dr. Kane is one of the most extraordinary men our country has produced. He is firmly of the belief that Sir John Franklin may be safe and thinks another expedition should be sent out from our country. In our opinion it would do no good, although it would be chivalrous. Mr. Grinnell has offered his vessels to government for another expedition.