

## Scientific American

NEW-YORK, MAY 21, 1853.

## Coal—Our Black Diamonds.

There was a time when a moral, brave, and industrious people could become a powerful nation independent of climate and natural resources of country, but this, we believe, cannot occur again. Men are indeed animated by the same passions that swayed mankind in the days of the Pharaohs and Cæsars, but the nations of the earth are now controlled by outward circumstances of a totally different character, and these have but recently come into existence. The invention of the steam engine and the application of its mighty power to manufacturing and commercial purposes, have made those nations the rulers of the world which have within themselves the greatest resources for maintaining the all conquering agency of steam. Commerce is President of Nations, and Coal is his Secretary of State.—With only a superficial area of 81,500 square miles of country, and a climate by no means favorable for agricultural productions, what would Britain be without her valuable 9,000 miles of coal fields? Without this where would be her ten thousand woolen and cotton manufactories; where her two thousand steamships and boats, and where her innumerable railroads and locomotives? Echo answers, where. The coal fields of the United States embrace an area of 133,569 square miles; those of Great Britain and Ireland, only 11,859; those of Spain 3,408; France, 1,719. With the exception of the British North American Colonies, which have a coal area of 18,000 square miles, the coal fields of all the other nations, in comparison with those of the United States, are mere patches on this globe. Two thirds of the commerce of the world is carried on by the United States and Great Britain, and as no nation can be commercially powerful now without steamships, and as no long sea voyages can be maintained without coal, the coal resources of our country form a well grounded basis on which to predict the future greatness and power of our Republic. Hitherto our forests have afforded an abundance of fuel for every want, and while we have used about 4,000,000 tons of coal per annum, Great Britain has been using for a number of years more than 32,000,000 of tons; France has been consuming 4,141,617 tons; Belgium 4,960,077 tons, and Prussia 3,500,000 tons. The great amount of coal used by England indicates her commercial and manufacturing power, in comparison with the other nations of Europe, but such a comparison with the United States, would not be correct, owing to our great resources of timber fuel. We have been informed, on good authority, however, that since we commenced to build and run ocean steamers, a few years ago, the demand for coal has increased so rapidly that no less than 17,000,000 of tons, it is believed, will be consumed per annum, within two years from the present date. Two lines of steamships—8 vessels—running between New York and Liverpool, used no less than 32,200 tons last year themselves. We ought to be grateful that the resources of our country can meet every demand for coal, even to 100,000,000 tons per annum for thousands of years to come. The time has now arrived when the quantity of coal used by a nation, may be taken as an exponent of its power—its commercial greatness, ocean and inland.

The invention of railroads has extinguished the difficulties of transporting our coal to the remotest parts of our country where no such fuel exists, and such places otherwise uninhabitable, may be rendered cheerful and glad some in the coldest nights of our dreary winters. In some places where silence and solitude now reign, the hopper, the spindle, the shuttle, and saw, will soon dance by the agency of coal to the music of steam.

Our country is not only favored by Providence with twelve times more coal area than any other country, but with every valuable variety of it, such as anthracite, cannel, and bituminous of every description. It is a singular fact that although our anthracite coal fields do not form the two-hundredth part of

our coal area, that nearly twice as much of this coal should be used as any of the bituminous kinds. It is also not a little singular that our bituminous coals are almost unknown and but little used in our Atlantic cities. In Great Britain no person burns anthracite for domestic use; the reverse has been the rule in New York. Within the past year, however, the good qualities of some of our bituminous coals have attracted much attention, especially those are that called the "Cumberland coals." This coal is excellent for domestic purposes, making a cheerful and warm fire, very durable, and so excellent for raising steam, that they are preferred by some steamship companies to all others. Having looked over the Report of W. R. Johnson, on the coals of the United States, we find that he estimates them highly. The demand for them has increased to such an extent lately, that 700 tons per day are now brought (we have been told) from the mines by a single company in this city. We could do without the gold of California, for it does not add a single real comfort to the life of man, but we could not do without our coals. The Koh-i-Noor diamond is valued at \$2,500,000—a sum which could purchase 500,000 tons of coal. If this diamond was dropt into the depths of the sea and lost forever, no one in the world would suffer for a single useful article the less, but if 500,000 tons of coals were prevented from coming to New York City this summer, 200,000 people would be reduced to a state of intense suffering during the next winter. Coals then, are the real diamonds of our country.

## The Plutonists—Heat of the Earth.

A year ago last winter, Prof. Guyot delivered a course of lectures in this city, purporting to be at the request of a number of orthodox ministers and others, in which he inculcated the nebular hypothesis, which involves the igneous hypothesis, or central heat of the earth. We took occasion at the time to point out the want of sufficient evidence to make out a case for this hypothesis, and even pointed out facts which completely nullified it.—During the past winter, Prof. Olmstead of Yale College, delivered a course of lectures in this city, in which he inculcated the very views we had expressed in this respect, he said "he had differed with his brethren of the profession." The nebular hypothesis consists in this, that at one time the whole of the materials of which the bodies of the solar system—sun, planets, and satellites—are composed, were originally in a nebulous state—a thin gas, and that by gravitation and rotation, through a number of ages, planets were consolidated, rings thrown off, and the world formed. This hypothesis is accepted for truth by the majority of astronomers, although it has not a rag to support it.

Prof. Olmstead, in speaking of the nebular hypothesis said, "If the nebular theory were true, why should there not be rings existing between the planets. There was a space of nearly one thousand million of miles intervening between Neptune and Uranus; why not then, rings between them, thrown out from the nebulous mass by the centrifugal force, when the entire mass is undergoing process of condensation? Again, it was claimed for this theory that the nearer we approached the sun, the greater became the density of the matter. But that was not true, for Uranus was denser than Jupiter, the earth than Venus, and the sun was only one-half the density of the earth."

The nebular hypothesis embraces the "igneous theory," as it is called, namely, that this earth is not yet cooled from its original molten state, that its interior is a hot mass, and that we live on a very thin crust. Hot springs and volcanoes are attributed to this cause, and with a strong degree of plausibility. David Muschet, however, one of the best practical and scientific mineralogists in the world, has lately published a letter in the "London Mining Journal," in which he dissects entirely from the views of the Plutonists, and overwhelms them with ridicule. He says:—

"The uniform cleavage of the fundamental crust in the direction of the magnetic poles was recorded long since by Humboldt, Sedgwick, and other observers, and suggested to them to hope that such a fact might lead to

the discovery of some great natural law.—Now, had this great natural law, when discovered, been compatible with the igneous dreams, could it have been engrafted and bound into the existing volumes of philosophers, it would, no doubt, have been readily received; but, unfortunately, the law of nature annihilated the law of man, therefore, man must continue to teach error, and the law of nature and truth be put to silence.—The inveterate determination to discover volcanic agencies has formerly as much blinded observation as it now blinds conviction. In Sir Charles Lyell's first edition, where he records with eminent candor and *naivete* his fruitless disappointment in searching out centres of eruption in Sicily, he relates facts which might have pointed to the truth, but for the engrossing prejudice of ascribing the trifling undulations of the earth's surface to the furious caprice of subterranean fire.

He refers to the columnar arrangement of ice in the northern regions of perpetual frost (a striking instance of the magnetic action) without explaining the phenomenon by the fusion or eruption of the ice in the state of lava, as the similar basaltic columns have been theorized to be formed. The masses of the earth, as much as the crystals that are included in them, are the subject and the product, not of convulsive throes, but of regular definite laws; and here, as everywhere else, the magnetic or electric fluid is the physical governor of the world."

Here we have a strong advocate of the magnetic theory, viz., that the mighty agent which produces and has produced so many changes in our globe, is electricity, and certainly we must say we are surprised that any person of common sense can look upon the face of a granite quarry and believe, (as every Plutonist must) that what he sees there is due to the arrangement of a vitreous mass, while he entertains no such belief respecting a free stone quarry.

## Events of the Week.

**SODA FOR INCrustATIONS IN BOILERS.**—We have received a letter from one of our subscribers in Royaltown, Oldham, Lancashire, Eng., who informs us that soda is not a preventative of incrustations in steam boilers. It indeed precipitates the lime in the water, but that is just the thing which should be avoided as it falls down and attaches itself to the bottom of the boiler. His brother ruined in a short time, a good steam boiler by the use of soda to prevent incrustations. He suggests an acid instead of an alkali to hold the lime of the water in solution in the boiler. We must say, however, that no known acid in combination with the lime, will hold it in solution in the boiler. The two will form a salt, which will fall to the bottom, such as the sulphate of lime if sulphuric acid is used.

**KENTUCKY MECHANICS' INSTITUTE.**—This new Institute, established in Louisville, has published the circular for its first annual fair. It is to be held in the month of October next. We hope the mechanics of Louisville will have a good fair. We understand they build the finest steamboats on the Mississippi; such is the reputation they have here.

**WATER POWER AT NIAGARA FALLS.**—We see it stated in a number of our exchanges, that a hydraulic canal at Niagara Falls, is about to be commenced, for factory purposes we suppose. It is stated that a company is formed for the object with a capital of \$500,000. The canal is to be nearly a mile long, seven feet wide, and ten feet deep, cut through the solid rock. It will form the finest water privileges for factories in the world, but we are not so sure about the sites for buildings—they cannot be built at the bottom of the falls.

**BLACK AND FAIR HAIR.**—There is rather an amusing article on "Human Hair," in the late number of the "London Quarterly Review." In Europe the fairest haired inhabitants are found north of the parallel of 48°. Between 48° and 45° parallel, there is a debatable land of dark brown hair, and to the tropics the races are generally black haired. There are exceptions, however, to these lines, as the Venetians have been distinguished for golden hair, while in Ireland the Celts have been distinguished for black hair. In Ameri-

ca, however, among the Anglo Saxon races, very fair people are found in the pine woods of the Southern States.

The difference of color in the hair is owing to the tint of the fluid which fills the hollow tube in each hair. This fluid has been analyzed by Liebig, and the result shows "that the beautiful golden hair owes its brightness to an excess of sulphur and oxygen with a deficiency of carbon, whilst black hair owes its jetty aspect to an excess of carbon and a deficiency of sulphur and oxygen." Few, perhaps, have ever bestowed a thought upon the number of hairs in the human head. A German, it seems, has applied himself to the task of counting them, and gives us the result of his labors:—"In a blond one, he found 140,040 hairs; in a brown, 109,440; in a black, 102,962; and in a red one, 88,740."

The red appears to be the coarsest, and yet we find silky and coarse fair haired people, and some have red hair of a beautiful soft, silky and wavy appearance, while others have it as coarse as wire and as bright as a brick.

**ATMOSPHERIC TELEGRAPH.**—We have received a letter from a Baltimore correspondent, who speaks disparagingly of the atmospheric telegraph of Mr. Richardson, which was illustrated two weeks ago in our columns. He wonders how men of science can advocate it, as "the packages in the tube cannot be sent away faster than the air pump works, which exhausts the tube." This is true, but the difference is, that the air pump may be kept working constantly, while packages need not be sent but two or three times per day. He speaks of a locomotive being as fast, and a much better way to send packages. Well, we have no doubt but a small locomotive and an air line of lilliputian railway would answer to carry packages if the plan could be carried out. A locomotive must stand idle when it is not working, but the atmospheric telegraph engine may be kept working day and night accumulating a force for the rapid transportation of a package, when it is to be sent. We hope the plan of Mr. R. will be successful, although we know there are many practical difficulties in the way, nothing but mechanical ones, however.

## The London Illustrated News and the Scientific American.

Scarcely a day passes but we notice clippings and cuttings from our columns by publications which think proper to borrow without informing their readers that the loan was obtained through the Scientific American. In taking up the "Illustrated London News," for April 24, two large engravings were presented to our view, of Improvements in Railroad Cars. The transfer was a *fac simile*, but no reference was made to their having appeared in the Scientific American nearly two years ago; it was referred to as a good specimen of railroad cars in America,—and indeed it was such at the time it appeared; but the "News" should be apprised that two years is sufficient to effect an entire revolution in the mechanical character of a country like the United States. The form, design, structure, and mechanical arrangement of a large portion of our improvements, particularly those pertaining to locomotion, are undergoing great changes, and if the "News" would present a fair contrast between American and English locomotive cars, they should come down to the present age, and not deal in the things that were.

## The Lords are Coming.

By the late news from Europe, we learn that the Earl of Ellesmere is appointed a Commissioner from England to the Crystal Palace Exhibition, in this city. Sir Charles Lyell, the eminent geologist, and Sir Henry de la Beche, the celebrated chemist are also coming. Well, we hope these men will be received by our sensible people as they deserve. They are distinguished for learning and scientific attainments.

A beautiful small locomotive engine is to be sent out with the Japan expedition. It will have all its accompaniments of tender and carriage, and a railroad of some length to match. It is intended to astonish the Emperor of Japan, as it is a perfect working model and will be in the charge of a competent engineer from Philadelphia.