Correspondence.

Origin of "Atlantic."

To the Editor of the Scientific American:

The correction made in your edition of the 17th of the present month, by G. W. R., of the etymology of the word *Atlantic*, from the Nahuatl *Atl*, water, *tlan*, near, between, we gladly would receive, were it not that it contains *tiny wee* flaws which greatly want repairs, although of no consequence to the kind corrector.

He informs his reader that the word *Atlantic* is derived from the Greek *Atlantikos pelagos*, which means *the open sea Atlantic*, though he has rendered it *beyond Mt. Atlas;* but he has forgotten to tell him also wherefrom the Greeks have obtained the word *Atlantikos*, hence its origin, and he has likewise failed to explain the etymology of the name of the patient old god *Atlas*, who is said to have sustained so long the whole world on his shoulders.

Truly, we would like him to give us the origin of these names; for to explain one by the other would seem like beating the devil round the stump a little too much.

AUGUSTUS LE PLONGEON, M.D.

204 Washington St., Brooklyn, Oct. 22, 1885.

The Star in Andromeda.

To the Editor of the Scientific American:

There does not seem to be the slightest evidence that the bright star which appeared in 1572 in the constellation of Cassiopeia had ever been authentically observed before. Most astronomies mention that a star appeared in the same position in the heavens in 945 and 1261, but have not been able to prove that it was identical with the Pilgrim.

The present attempt to identify the star recently discovered in the nebula of Andromeda with this Pilgrim star of Cassiopea seems very fanciful when one reflects for a moment what an incalculable distance separates the two positions, and what an incredible velocity would be required of this wandering star to traverse the space in the brief period of 313 years.

GEO. R. CATHER.

Ashville, Ala., Oct. 19, 1885.

At the Interior.

PORPHYRY DYKE.

Chemistry is still a new science; it was only in 1776 that Priestley discovered oxygen, and until then the science can scarcely be said to have existed; for without a knowledge of this essential element, all systems and methods were purely empirical. But in this little more than a century many wonderful results have been accomplished, and the new science ranks quite as high in its progressiveness as those of more ancient origin. Working with its sister sciences of physics and geology, the life history of our planet is being gradually unfolded by its aid; the cataclysms which the older philosophers were contented to offer as explanations of all past operations of nature are now fading altogether from sight, and giving place to a belief in the continuity of natural forces. Men are no longer content with these vivid pictures of the imagination, and ask, instead, the sober deductions from observed facts. The forces which have been observed in operation during the historical period are found to be all sufficient to explain the present condition of the earth.

This tendency toward the rational method has nowhere been better illustrated than in our study of the interior of the globe, and of the reactions which occur in this subterranean laboratory. No uniformity of belief has been attained, it is true, but the questions have been handled more scientifically. The origin of coal is a case in point. The early geologists pictured the carboniferous swamps, where the vast stores of fuel were accumulated, as covered with great forests of lepidodendrons, sigillaria, calamites, and gigantic tree ferns, and enveloped in an atmosphere so saturated with carbonic acid gas that only the lowest forms of animal life were possible. The ideal foliage of the coal period is a diagram familiar to most students, and it is certainly very striking. Now, however, patient investigators with the microscope, and in the field, point out to us the structure of mosses and lichens in the apparently structureless coal, mere weeds by the side of the pictured giants, and show us the undeniable similarity between the ancient swamps of the carboniferous and our present peat beds. The excess of carbonic acid gas in the atmosphere, which formed so pleasant and convenient an hypothesis, has been so far reduced that there is even a doubt whether the amount was any greater than at present. The position of the coal beds is no longer ascribed to the sudden sinking of the carboniferous formations and the rapid accumulations of the superimposed strata.

The gradual settling of the bed of the Pacific and of portions of the coast of Northern Europe offer a sufficient explanation for the change of level which in time submerged the coal swamps and permitted the deposition of the Mesozoic and Tertiary rocks, which in turn produced by their weight the pressure and heat necessary for the consolidation of the peat into coal. The origin of rock oil, or petroleum, has led to even greater discussion than the question of coal; for beyond the observation that it comes from the rocks immediately underlying the coal formation, the Devonian system, few facts regarding it are known, and the fancies of the theorist have therefore a fertile field for their generation. There are so many possibilities that there is an unusual chance for originality. It is generally conceded that the oil has not originated *in situ*, but has come either from above or below, from the distillation of the volatile constituents of the coal deposits, which have descended and become condensed in the Devonian sands, or from the destruction of vast beds of seaweed or other organic matter in the Silurian below. The idea that the amount of petroleum is too great to have originated from either vegetable or animal deposits has given rise to still another theory, which supposes that the oil originates from chemical combinations of hydrogen and carbon in the interior of the earth.

Our knowledge of the conditions which maintain in this interior laboratory is still too slight to warrant any definite assertion in regard to the possibility of such a reaction occurring on the large scale; but we do know that in our surface laboratories the hydrocarbons in this series are derived from the decomposition of more complicated hydrocarbons, and not from a direct synthesis of the component elements. Baron von Richthofen's explorations in China have disclosed a single anthracite coal field in one of the provinces of that empire which contains sufficient material to supply the coal demand of the entire world at the present rate of consumption for over 2,000 years. These evidences, and those derived from the vast beds of limestone found the world over, whose organic origin is not questioned, do not lend support to any argument which disputes the organic source of petroleum on the supposition that such an origin would tax the life resources of the planet.

When any object becomes prominent, it is very natural for us to want to know where it came from, and its history. If it be a man who attracts our attention, we want to know his record, and later of his ancestry. The biography of an invention which attains a wide application becomes of great interest to us. The crude materials of large industries or the staples of everyday life have a place in history. Products of such importance as coal, petroleum, and natural gas excite a curiosity aside from either scientific or economic considerations, and to learn their history means the comprehension of many modifying conditions. Our investigations in this direction are still very elementary, for the simple question of temperature and the varying effects of pressure in modifying its action are still under discussion. The latest effort to obtain some definite information on this point, that of the German Government in sinking the deep shaft near Schladebach, which has gone down nearly 5,000 feet, has really told us but little. The deductions drawn from this very slight puncture are that at a depth of about two miles the temperature of boiling water would probably be reached, and at forty-five miles the heat of melting platinum would prevail—that is, the temperatures at which water boils and platinum melts at the surface; but when the effect of pressure is considered, we are uncertain that the temperature of boiling water is ever reached. In the radial race between the actual boiling point and the increased temperature of that point due to pressure, it is impossible to say that the one ever catches up with the other. When we are unable to decide so simple a point as whether water can ever reach the boiling point in the interior of the earth, the more complicated processes of chemical decomposition and reformation seem quite beyond our grasp; but a fuller knowledge of the chemical and physical laws which maintain under ordinary atmospheric pressure and temperature will go far toward the explanation of those hidden processes which take place beneath the surface. It is an encouraging sign in our scientific progress that we are coming to consult evidence rather than exercising our energy in the formulation of ingenious theories to take its place.

A Paper Chimney.

A manufacturer of Breslau is stated to have built a chimney, over 50 feet in height, entirely of paper. The blocks used in its construction, instead of being of brick or stone, were made of compressed paper, jointed with silicious cement. The chimney is said to be very elastic, and also fireproof. We may add that picture frames are now made of paper on the Continent. Paper pulp, glue, linseed oil, and carbonate of lime or whiting are mixed together and heated into a thick cream, which, on being allowed to cool, is run into moulds and hardened. The frames are then gilt or bronzed in the usual way.

IN Memphis, Tenn., sixty buildings have been condemned by the authorities as unsafe for habitation. Owners are required to put them into habitable condition or to demolish them. Most of them will be torn down and new dwellings erected.

Liquid Fuel in California.

A few months since, we gave an account of the experiments which were being made by the Central Pacific Railroad Company with petroleum as fuel on some of their steamboats. At that time they had tried it upon the freight steamer Thoroughfare, plying between Oakland and San Francisco, and on the transfer boat Solano—the largest ferryboat in the world—on Carquinez Straits, running between Benicia and Port Costa.

Since that time they have been able to determine more in detail concerning the results. On the Thoroughfare they saved $7,000 in the cost of fuel in the five months they were using oil as compared with the five months of the same season last year, when they were burning coal. Besides saving 44 per cent in actual fuel, they got rid of four firemen, which makes an additional saving of $240 per month. On the Solano there is not so much saving, the cost being lessened but 17 per cent. She makes short trips, and they burn the fuel while she is in the slip, to generate necessary steam.

The oil costs $1.70 per forty gallon barrel, or about four cents a gallon. It is estimated by the engineer of the big Water Witch, which is also using oil, though a somewhat different kind from that used by the railroad company, that 100 gallons of oil is equal to a ton of coal, which latter costs about $7 per ton.

The Oakland ferryboat Piedmont has just been altered so as to use the liquid fuel. She has not yet been put at work under the new system, but will be in a few days. The oil is sprayed under the boiler by a steam jet, and is supplied by suitable tanks. A supply tank is kept on the wharf, so that the oil may be led into the steamer's tanks. The supply tank is filled from tank cars, so there is no handling. There is no smoke or soot, and of course no ashes. It is stated that in addition to the lower cost of the liquid fuel, the services of 16 firemen will be dispensed with on the Piedmont. The mechanical alterations to effect the change of system are slight. The other ferryboats will be changed to burn oil shortly.

As the coal used on these steamers was imported, and a good deal of California petroleum will probably be used, the change will be good for this State in utilizing one of its products. The amount of petroleum obtained from California has steadily been increasing for the past five years. In 1879, 19,858 barrels were produced, and in 1884 more than 100,000 barrels, thus quadrupling the yield in the space of five years. California now ranks third among the petroleum producing States; New York is second, and West Virginia fourth. The petroleum resources of the State are being carefully developed, and the more of the product we can use here, the better it will be for California.—*Min. and Scien. Press.*

Slag Wool.

Slag wool is a substance produced by the action of powerful jets of steam upon the melted slag from the furnace. It is in fact a species of glass blown out by steam into the form of fine threads. It is incombustible, and in England it is much used in buildings as a filling. In Mansard roofs the space between the exterior covering and the interior lath or paneling is filled with this material. The heat of summer in upper apartments is thus very much mitigated. Used around water pipes and the like, it prevents their freezing in winter. It is an excellent protection when used as a covering for steam boilers and furnaces. It is a nonconductor of heat, and thus it is well adapted for use in lining the air spaces of refrigerators.

Paper in Tonkin.

The principal material used in the manufacture of paper in Tonkin is the *ke-yioh* or paper tree, which grows in abundance on the mountains in the environs of Sontay. The dried bark of this is brought in bundles upon the backs of oxen or buffaloes from the mountains, where it is gathered for the numerous paper mills, whose principal center is in the vicinity of Hanoi. It is worth about two cents a pound. This bark is macerated and then rubbed up in mortars, so as to reduce it to a fine pulp. This latter is extended with a certain quantity of water in order to form a clear paste, which is sized with an infusion made from the shavings of the *gomao*, a tree which grows in abundance on the Black River mountains.

The paper is manufactured sheet by sheet by women by means of delicate bamboo screens that they alternately dip into the paste and take out therewith a thin sheet of paper, which they deposit upon a board. At the end of the day these sheets are put into a press in order to extract the moisture from them, and are then dried by placing them one by one upon a hot masonry wall. Finally they are put up in packages and trimmed.

Each woman makes a thousand sheets a day. The thickness of the paper depends upon the consistency of the paste. One establishment that was visited by the person who furnished these data was capable of producing 80,000 sheets per day with 80 women and 40 assistants. Paper was being made here worth 65 cents per thousand sheets.—*Gutenberg Journal.*