Foreign Editorial Correspondence.—No. 8.

Paris Exhibition, &c.

PARIS, June 28, 1855.

As every country has its distinguishing marks, not only in the habits and customs of its people, but also in the labors they perform, it will be no more than just to award to France the first place in the field of practical and analytical chemistry. Art of almost every description is practiced in greater perfection in France than in any other country, and the labor of her eminent savans, Lavoisier, Guy Lussac, Chaptal, Dumas, and others, justly entitle her to the first consideration in this respect.

In the Palace of Industry, England comes forward with her solid and useful machinery, —iron, cutlery, tissues, and engravings. Germany with her arms, porcelain, musical and mathematical instruments, lace, and embroideries; and other countries with less productive power exhibit well chosen trophies of their respective branches of industry. The only exception to this is Russia; she has chosen to isolate herself from this peaceful association, and throw all her vast strength into the tide of disastrous war. France, from its brilliant capital, gives impulse to fashion, by sending forth a complete invoice of unsurpassed fabrics, whose perfection is dependent upon chemical science; this is her foundation; take it away, and down tumbles her well-earned fame as a producing country. The success of France in this department is, in a great measure, due to the encouragement given to art by its government, and it seems a mystery that so little thought has hitherto been bestowed upon the science of agriculture. It is really painful to look upon the ancient notions that so generally prevail in this important branch.

In the Exhibition, the glass and crystal works of France are superior to those exhibited by any other country, and throughout there are abundant examples of her beautiful chemical productions on exhibition. So abundant are they, that it is out of my power to do more than glance at such points as appear just now most worthy of notice. In pharmacy and perfumery there are large displays. In these departments France has no rival; this is evidently proved by her extensive exportation of these articles throughout the whole world. The subject of greatest interest to the French people is fuel; they employ clumsy devices for burning it, and this seems the more strange from the fact that it is very scarce and high-priced.

But even with some good improvements for consuming their fuel, they also find themselves reduced to the necessity of discovering a new article of fuel itself. The progressively rising price of coal in France enforces the necessity of creating new resources, or of discovering new mines, in order to meet the necessities of the increasing industry of the country. This result seems to be almost if not entirely gained, if I may judge from the beautiful specimens of artificial fuel displayed in the Exhibition. This artificial coal is made of the dust of several different kinds of refuse wood, agglutinated by the tar produced from gas manufactures, and then carbonized. The result of this process seems, from experiments, to offer a fuel at a moderate price that gives regular combustion, and also a constant and uniform heat. The specimens of this new fuel are excellent, and there is no doubt but that the waste gases from manufactories, and also the refuse particles of wood, may be made to supply a very good fuel—limited of course in its amount.

I shall now speak of a trade offering greater results—the turf; numerous specimens of which are on exhibition. Turf for fuel is found in the central part of Europe. Its formation is, I dare say, cotemporary, and daily taking place. It is a compound of aquatic mosses, and is the only fuel of the central part of Germany, Spain, and Italy, and these countries will profit largely from the labors of French chemists in rendering it an article of still greater value and importance to them.

These mosses, when dryed and carbonized, afford an excellent fuel for the working of iron, steel, cast iron, and various other metals. This is well known, but it is only lately that attempts at the distillation of the fuel have been crowned with success. By the recently invented process of Morceau and D'harcourt for the distillation of turf, the following products are obtained:

First, a gas giving a purer light than is obtained from coal.

Second, a substance resembling stearine, which gives not only more light, but it is also more pure and transparent than stearine. The beautiful molded specimens on exhibition have the appearance of the most refined wax candles. So far as regards the process, I know but little of its practical economy, but I am informed that it is satisfactory. France and England exhibit specimens of excellent tar oil. It is extracted by distillation from bituminous schists and asphaltic limestone (schistous clays,) from the secondary grounds adjoining the coal mines. These bituminous schists are remarkably rich in Wales, and when purified by distillation, they produce a kind of paraffine used for glazing and whitening stearine candles. The paraffine, however, is not the only new fatty product that serves the wax candle manufactories of France. They have lately extracted from a plant called the *ricin*, an oil that is found to be very useful in this branch of business, as it possesses the properties of paraffine, and serves the same purpose. To this new product is joined a new caprolic alcohol, which is at present a product of the laboratory. I do not know if this plant grows in our country, but it is plentiful in South America and Cuba.

I notice in a late number of the SCIENTIFIC AMERICAN, a brief extract about a new metal lately discovered here. The subject attracts considerable attention, and from representations made to the Emperor respecting its importance, he granted out of his private purse the sum of $6,000 to the young chemist, Deville, the inventor, to assist him in perfecting it. This new metal is called aluminum, and until now it has been obtained with the greatest difficulty. It has the properties of copper, platina, and silver, and is insulated from clay. It is almost proof against the most concentrated azotic and sulphuric acids, and is white, fusible, ductile, and unoxydizable in open air. It is obtained by a re-action of sodium on chloride of aluminum, the aluminum remaining insulated. Some articles of jewelry have already been manufactured out of it, and it has also been used for the electric battery, instead of platina, and in this last application it produces a more intense, regular, and continuous current. The most practical minds of the European continent anticipate many useful applications of this metal, owing to the abundance of silicates of aluminum, as it will give rise to a great trade, and afford a new element to the workman and artists.

S. H. W.

Paine's Electric Engine.

MESSRS. EDITORS—A number of your readers have written to me on the subject of my electro-magnetic engine, making inquiries respecting its peculiarities, and as I perceive by some remarks of your own on the subject that you have been misinformed as to its nature, I send you the following:

The engine lately on exhibition in this city was not constructed for the purpose of a motor, but as a magnetic electric machine intended to generate currents for electrical experiments. When, however, it was placed in a battery circuit, it exhibited sufficient motive force to render it a machine of great interest. The elements which composed the apparatus were thirty permanent magnets, weighing eleven pounds each, and thirty helices of No. 17 wire, weighing four pounds each. The mean attractive and repulsive force of each helix was twenty pounds under a velocity of 2600 feet per minute. The diameter of helix wheel is 35 inches, and weight of periphery and helices 260 lbs. In seven seconds of time the wheel attains a velocity of 309 revolutions, and the reversing of the battery current brings it to a dead rest in seven seconds. The battery force employed was 6 cups, Grove's arrangement, of 9 square inches of platinum, and the duration of such force ranged from seven to eleven hours.

You will perceive, on comparing the above statement with the report of Prof. Mapes on the Page engine, that I have arrived at a result with 54 inches of platinum that could not be attained by the Page engine with a battery of 10,000 square inches, one hundred cups of 100 square inches each only giving 6·84 horse power.

Some of the mechanical details and general configuration of the engine are like other electro-magnetic rotary engines, but the position of the polar curves and management of the currents are entirely dissimilar to any experiment now on record. While the engine is in motion, the circuit is never broken, and consequently there are no secondary currents, or waste discharges, due to the breaks of pole changers. The method of acquiring these results is the patentable feature of the engine, and should not now be made public, it being at present a subject of foreign application for letters patent.

Your correspondent, W. W. Bennett, mentions the use of electro magnets in Prof. Hall's engine as superior to that of permanent magnets. Of course when their comparative individual powers are considered, the electro magnet is many times the superior, but when we consider the result of their combined action, we must decide in favor of the permanent magnet, simply because the permanent magnet becomes, by induction, as the electro magnet approaches, as powerful as the electro magnet itself, and consequently the use of battery force to sustain one set of magnets, is not required. To secure such action, however, the polar arrangement of the permanent magnets must be different from that of electro magnets in their place, and this difference is what gives my engine a part of its great gain over other machines of its kind.

I am now engaged in constructing an engine of fifty-horse power for the rails, and if it fails of success, it will not be because of any difficulty heretofore met with by experiments, but from some new obstacle, which, in its turn, must and will be overcome.

H. M. PAINE.

Worcester, July 10, 1855.

[Here we are told that his machine is composed of thirty permanent magnets and thirty electro magnets, and that there is both attraction and repulsion amounting to 20 lbs., manifested in each electro magnet moving at a velocity of 2600 feet per minute, and the circuit never broken. We cannot conceive how both attraction and repulsion can be manifested at the same time, by the same electro magnet and under the same conditions, as plainly stated in this letter. Permanent magnets are unsuited for producing motion in a machine; ten thousand of them would not make Mr. Paine's electric engine revolve, yet, by some hocus pocus, while he admits that singly they are inferior to electro magnets, he asserts they are collectively superior—thus rivaling the famous centrifugal force engine, by obtaining a power "coming from nothing and costing nothing." His engine, by his own figures, exercises about 1·57 horse power, but this, no doubt, is exaggerated, as the 20 lbs. of attraction and repulsion mentioned is something hypothetical. We venture the assertion, that when he gets his fifty-horse power locomotive on the rails (if ever he does,) that it will easily be beat by a steam locomotive that will not cost half as much to construct or maintain in working order.

The Economy of Mowing Machines.

Now let us compare a little the two modes of cutting grass. Day laborers, hired at $1 per day, will probably mow in medium grass 1½ acres to the hand; that is, it will cost $5 or $6 to mow 8 acres, and 25 cents each hand for boarding will be $1,50 more, which, added to $5,50 makes $7 for mowing 8 acres. Now hire a man with a span of horses and a machine to cut the 8 acres, at 50 cents per acre, and he will cut it in a day—$4, and $1 more will pay their boarding, making in all $5, and the grass will be spread better for curing than a man will spread it after the 5 hands, which, in the estimate, will make $3 advantage to the mower. At that rate, the machine will pay for itself in 40 days mowing, besides saving so much hard labor.—[Jos. Mosher, in Ohio Farmer.

Steam Boilers—Saving of Fuel.

MESSRS. EDITORS—I observed your article in the SCIENTIFIC AMERICAN of June 16, on the subject of steam, and am induced to write you a few lines on the subject. The great majority of the boilers now used in this section are the common flue boilers, which, on account of their strength, are preferred generally to the low pressure boilers, which are very expensive in their fabrication. Some years of experience and study have satisfied me that very long boilers are not the most effective, as the fire dies out; and where it ceases to be efficient to make water boil, the balance of the space through which it passes is useless, and in some degree a positive evil, as it must act as a condenser to that part of the boiler where the steam is generated.

In using flue boilers we commence firing underneath, and it cannot escape your observation that one half of our fire is lost on the brick bed which, by its reflective action, returns back but a small portion of that which it receives; some writers say one-fourth; some say one-eighth; the balance must be a dead loss. Thus in the outset, it will be observed that we lose one-half, or nearly so, of the benefit of our fuel.

Now, if we are to continue to use flue boilers, it becomes a matter of the most serious inquiry as to which plan is the best, so to arrange them as to economize our fuel to the greatest advantage. About eighteen months since I erected a boiler after the plan known as Bird's patent, which will be found illustrated in the SCIENTIFIC AMERICAN of Sept. 23, 1854, by which you will observe that one boiler is placed directly above the other. The lower boiler in this case serves for the fire bed, and receives the heat as it first radiates from the furnace. By this means the fuel used for one boiler is made to subserve the purposes of heating two, and a corresponding degree of fuel saved, say one half, while double the amount is now daily expended in heating two or more boilers placed side by side, while one half will be amply sufficient for the purpose. No smoke appears above the tops of my chimneys, though not more than thirty feet high, and this I attribute to the fact that the intense draft caused by the upper and lower sets of flues causes it to be consumed in its progress. I will state what is well known in this community, viz., that I do not use more than one half the fuel generally used by those engaged in similar business, as driving a saw mill, grist mill, machine shop, &c., where the boilers are placed side by side in the usual manner.

W. E. B.

Cahaba, Ala., July, 1855

The Alanthus Tree

A great outcry has again been raised this season against the above tree, and the New York *Times* has reiterated the old cry, "Down with the alanthus!" Before this tree is cut down in any of our streets, we hope those persons who fiercely call for its destruction will be so good as to provide a superior substitute. We do not know of any, nor has one been recommended by any of those who seem to be demented in their efforts to annihilate it. It is really the only shade tree in our cities that is proof against abominable vermin. If it has an offensive smell, for a few days, during its blossoming period, its beautiful appearance and vermin-proof character outweigh all the arguments that have been brought forward to destroy it.

Wardwell's Machine for Tenoning.

The machine of C. P. S. Wardwell, illustrated in No. 44—first page—describes it as peculiarly adapted for tenoning bedstead rails, but it is adapted for all kinds of square tennon work; this we should have mentioned, but supposed that every person understood it.

Locomotive building seems to be reviving at all the large manufactories. A firm in Paterson, N. J., has 57 orders ahead for locomotives.