

turf consumed, when the factory is in regular work, for the following reasons:—In the first place, on the furnaces being lighted the expansion in them was very considerable, and for some weeks I believe that the greater proportion of the products escaped through the innumerable openings thus formed; this evil gradually abated as the furnaces became vitrified: 4 or 5 tons of tar may be considered as having been lost on first starting by the coating which the various tubes through which it passes have taken up; but a far greater source of loss in products than either of these has been caused by the constant necessity of blowing out the furnaces from the front, in order to keep the bottoms of the furnaces sufficiently heated to prevent the slag from clogging them. The great cause of this having been so constantly requisite, has been the excessive irregularity of burning, consequent upon the inefficiency of the blowing machine.

**GAS.**—For the last week or ten days since the blowing machine has been put in somewhat more efficient condition, the amount of gas has been very satisfactory. We have frequently had more gas than we required, though only working with two cylinders. Previously to this, there has been generally a deficiency of gas, and we have not, therefore attempted as yet to make any charcoal.

**IRON ORE.**—A considerable quantity of iron ore, both clay-band, and brown hematite, is calcined, and ready for putting into the furnaces, as soon as we can again get them sufficiently hot for smelting. This, however, cannot be, until we have had the four cylinders of the blowing machine continuously at work for a considerable period.

**TURF CUTTING.**—We have cut this season up to the present time about 10,000 tons—1100 of which is now clamped. The excessive quantity of rain for the last month has prevented a greater proportion from being clamped. We have still on hand from last year's cutting 1690 tons of turf. The difficulty in procuring labourers for turf cutting has been this year unparalleled throughout the country.

I have strictly confined myself in this report to plain statistical facts, for these are what all will look to; but had the general meeting been a month later, I feel confident, provided no unforeseen accident should occur, that I should have been enabled to form statistics relative to the further purifying of the products, that would have been much more satisfactory to the meeting than those I am at present enabled to afford—I allude more especially to the amount of pure paraffine, and also of valuable oil that we now expect to obtain from a given quantity of tar. I trust, however, that the unvarnished statements which I have now given will be satisfactory as far as they go.—[I. F. POWELL.

#### Product of the Precious Metals throughout the World in 1853.

	GOLD.	SILVER.	TOTAL.
America. . . . .	\$109,156,748	\$29,807,456	\$138,964,204
Europe. . . . .	22,138,914	8,618,937	30,757,851
Asia. . . . .	19,847,658	5,197,218	25,044,876
Africa, &c. &c. . . . .	4,000,000	. . . . .	4,000,000
Australia. . . . .	96,000,000	. . . . .	96,000,000
Grand total. . . . .	\$251,143,320	\$43,633,611	\$294,796,931

The following will exhibit the annual product at various periods prior to above:

1492. . . . .	\$250,000	1800. . . . .	\$52,529,867
1500. . . . .	3,000,000	1842. . . . .	69,987,681
1600. . . . .	11,000,000	1848. . . . .	86,661,060
1700. . . . .	23,000,000	1851. . . . .	180,173,873

The statistics lately collected by the Secretary of the Treasury (U.S.) present some interesting facts. According to the statement of Mr. Crawford, the amount of specie in the country in 1820 was only \$37,000,000.

Product of the mines from that date to 1849. . . . .	\$37,705,250
Import of specie from 1820 to 1849 amounted to. . . . .	\$252,169,841
Exported during the same time. . . . .	180,462,406
Leaving an excess of imports over exports of specie to 1849 of. . . . .	71,707,435

In the country on the 1st of January 1849. . . . .	\$122,412,685
Supply from the mines from 1849 to 1854. . . . .	194,363,117
Imported in same time. . . . .	26,508,774

\$343,294,574

Exported from the country between January, 1849, and January, 1854. . . . . 112,695,574

Specie in the country, in January, 1854. . . . . \$230,589,502  
—being one hundred and eight millions of dollars more in the country now than in 1849. But there are large amounts of money brought into the country that cannot appear in statistical tables. It is estimated that over \$30,000,000 in coin have been brought in by immigrants since 1849. Of the two hundred and thirty millions in specie in the country now, a little less than sixty millions is in the banks; a little more than twenty seven millions in the national treasury; and the balance is in circulation, or hoarded up by private owners. The gold and silver in circulation is over one hundred and forty-three millions of dollars now, and the circulation of bank paper is over one hundred and ninety-four millions of dollars. Together they make over three hundred and thirty-eight million dollars as the active money of the country at the present time.

#### Results of some recent Investigations of M. Vicat,

*Upon the Destructive Action which Sea Water exerts on the Silicates known in the Arts as Hydraulic Mortars, Cements, and Pozzolanas.*

M. Vicat, to whom we are so much indebted for our knowledge of the preparation of cements, has recently presented to the French Academy of Sciences the following *resumé* of the chief general results to which a very long course of experiments upon that very important subject, the durability of cements in marine construction, has led him:—

1. That the double hydrated silicates of lime and alumina just mentioned are very unstable compounds.
2. That pure water, when poured upon all of them in the state of as fine powder as can be produced by ordinary means, no matter what might be their age or hardness, will dissolve a portion of their lime, provided they have not been in any way, or at least a very slight degree, exposed to the action of carbonic acid.
3. That if, under the same circumstances, a very dilute solution of sulphate of magnesia or Epsom salt be substituted for the pure water, the greater part, and often the whole, of the lime existing as silicates passes into the condition of sulphate. If any carbonic acid had previously acted upon it, the carbonate of lime thus formed is not decomposed by the sulphate of magnesia.

4. That all pozzolanas, no matter what might be their ages, require for their complete saturation a very much smaller quantity of lime than is added in practice, especially when we take into account their very imperfect state of division from the rough way in which they are usually prepared.

5. That the affinity of carbonic acid for the lime in combination with these various silicates is so strong, that it is possible, with the aid of a little moisture, to completely neutralise it, wherever it can penetrate, and thus leave all the other constituents of the cement, whether in combination or not among themselves, as mere mixtures in the mass.

It follows, from these results, that sea-water will destroy every cement, mortar, or pozzolana, if it can penetrate into the mass immersed in it. As, however, certain of these compounds are perfectly durable when constantly immersed in sea-water, they cannot have been penetrated by it. Its penetration has been prevented by the surfaces, and the source of this inability to penetrate is chiefly caused by a superficial coating of carbonate of lime, which has formed either anteriorly or posteriorly to their immersion, and which in time augments in thickness. The effect of a kind of cementation produced by the decomposition of the sulphate of magnesia, of the sea-water, and the deposition of carbonate of magnesia in the superficial tissue of the mass, and the formation of incrustations and of submarine vegetation, contributes also to this impermeability. But all such superficial impermeable coatings are not attached with the same force to the mass which they envelope. The differences which have been observed in this respect depend in some cases upon the chemical constitution, and upon the peculiar cohesion of the silicates, and in others upon the submarine situation, relative to the action of the waves and the rolling or dashing of shingle upon them. Hence the differences which have been observed by engineers in the durability of concretes of which such silicates form the gangue.