in diameter, and in twelve hours burnt six and four-tenths pints of oil, and used sixty-four cubic feet of oxygen. This he considers as the best proportion, though there is such power over the lamp that it can be increased to almost any intensity.

Abstracted from a statement of the examination in the *Nautical Magazine* for November, 1839.

Progress of Civil Engineering.

New Overshot Water Wheel.

The great overshot wheel, erected by the Kilgetty Colliery Company, at Merriton, near King's Moor, Pembrokeshire, was set to work on Saturday the 7th ult., in the presence of a large assembly of the ladies and gentlemen in the neighbourhood. This wheel, we believe, is the most powerful in the principality, being of 75 horse power; the diameter is forty-feet, and it is seven feet wide on the breast, and the buckets hold water more than one-third of the circumference. It is fixed in a manner that is quite novel in this country, the wheel being so closely shut in by finely-executed masonry, that the escape of water, without going to the buckets, is impossible. It works by eccentrics, giving a horizontal motion to the cranks, being the first application of this mechanical arrangement to such a purpose. It is adapted to work two pumps, giving twelve strokes a minute to each pump. The water is diverted from the stream about two miles from the wheel, and it is brought to it across the valley by an aqueduct, extending 300 feet in length, and from thirty to forty feet high. The wheel will supersede the use of steam power in the colliery, and it is contrived that, in time of drought, the water to be raised by the wheel will assist to drive it. The whole arrangements of the wheel are new applications of mechanism, and great improvements on plans hitherto in use. Considerable attention has been given to these works by parties who are not interested in them; and in the immediate neighbourhood, where so much enterprise at the present moment is in active operation in mineral undertakings, they well deserve the attention of all parties engaged in such enterprises. The works are close to the new road leading to Hobbs' Point, and may be conveniently inspected by parties travelling that way. The wheel and machinery were designed and executed by Mr. Thomas Dyson, of Downham, in Norfolk, where the wheel was made, and he has personally superintended the execution of the whole work. Although the wheel was made in order to drain the mine by pumps, it is understood the parties have since been advised to try instead the patent hydraulic belt, and intend to adopt it. A model was exhibited, and excited much surprise at its simplicity and its effective power to raise water on a small scale.

Lond. Mech. Mag.

Statistics of the Iron Trade. By HYDE CLARKE, Esq., C. E.

In 1826 this country was visited by a French statistician, M. de Villegem, for the purpose of investigating the state of the iron manufacture, and he has given an estimate of the number of furnaces in that year, which seems generally accurate. The following is a table of the progress of each district, as far as it can be made out from the several authorities, although they are mixed up very confusedly. The returns of 1802, 1820, and 1827,

are from the Parliamentary returns; 1826, from the French estimate, and 1839 from the one given in the previous article.

	1802. Frn.	1820. Tons.	1826. Frn.	1827. Frn. Tons.	1839. Frn. Tons.
Scotland	28	20,000	56	18 36,500	50 200,000
Cumberland			84	24 43,000	32 86,000
Northumberland, Lan- caster, & Leicester					
Yorkshire	28	50,000			
Derbyshire	17	12	24,000	16 48,000	
North Wales	—†				
Shropshire	42		180,000		31 78,000
Stafford	42				
Swansea District	—	78	95 216,000	125 400,000	
Glocester	18	150,000	—	—	10 25,000
Monmouth			—	—	5 15,000
Merthyr District	52		78	90 272,000	120 550,000
	227*	400,000	305†	284 690,000	417 1,512,000

The following is M. Virlet's estimate of the amount of iron annually produced in Europe in 1835, with an annexed column of corrections to the present time:—

	M. Virlet. Metrical quintals.	Estimate. Tons.
England (1827)	7,968,000	1,512,000
France (1834)	2,200,000	600,000
Russia (1834)	1,150,000	150,000
Sweden and Norway (1825)	1,000,000	120,000
Austria (1829)	850,000	100,000
Prussia	800,000	100,000
Hartz Mountains	600,000	70,000
Belgium	600,000	80,000
Elba and Italy	280,000	28,000
Sardinia	225,000	22,000
Piedmont	[200,000]	—
Spain	180,000	18,000
Norway	[150,000]	—
Denmark	135,000	13,000
Bavaria	130,000	15,000
Saxony	80,000	10,000
Hanover	[10,000]	—
Poland	75,000	8,000
Switzerland	30,000	4,000
Total	13,433,000	2,850,000
Or about	672,000 tons.	

England produces about one-half the whole quantity, France about a fifth, Russia, Sweden, Austria, and Prussia, each about a twentieth. The total produce must be about three million tons.

* Total in blast. † 280 in blast, produce 728,000 tons. ‡ With Merthyr.

The following, illustrative of the importance of the English iron trade, is a comparison of some of the European, English, and French iron districts. It may be premised, by the bye, that South Wales alone produces about as much as all France put together, and Staffordshire, Scotland, and Shropshire, each surpasses any other European country:—

England.		France.		Europe.	
	Tons.		Tons.		Tons.
South Wales	550,000	Champagne	124,000	France	600,000
Staffordshire	400,000	Jura	83,000	Russia	150,000
Scotland	200,000	Ardennes	77,000	Sweden	120,000
Shropshire	150,000	Nievre	64,000	Austria	100,000
York, &c.	86,000	North West	35,000	Prussia	100,000
Total	1,886,000		583,000		1,070,000

In concluding this subject it may be noted, that, for the service of the South Wales district alone, 300 miles of railway are constructed.

Mining Review.

Difference of Longitude between Greenwich and New York.

I have the satisfaction to inform you of a second instance of the successful transport of chronometers from London to New York, for the purpose of determining the longitude of these two cities. The first, as you will remember, took place in the months of July and August last. The result then obtained was compared with that given by M. Daussy, a distinguished French hydrographer, in the *Connaissance du Temps*. The difference of these results was 2.63 sec. This was satisfactory under the circumstances of a first attempt, made in the first trip across the Atlantic of the *British Queen*; still I felt the difference to be too great to be permitted to remain without an attempt to diminish it, or to ascertain which of the two was nearer the truth. On the very next voyage, therefore, of the same vessel, and under the same friendly auspices of Captain Roberts, and my friends in the United States, I sent a second set of four chronometers from London to New York. Their rates, &c., were ascertained precisely as those of the first set, and the whole experiment conducted in the same manner. This voyage of the *British Queen* was made, out and home, in the last and present months. The result, I have the pleasure to announce, is this time, almost exactly the same as that of M. Daussy's; so near, indeed, that I feel it to be a duty, and one of the most pleasing nature, to express thus publicly my great admiration of the accuracy of his statement:—

	<i>h.</i>	<i>m.</i>	<i>sec.</i>
By this second experiment the difference of longitude between the Observatory at Greenwich, and the City Hall, New York, is	4	56	0.24 W.
According to M. Daussy it is	4	56	0.72
Difference of the two observations	0	0	0.48

The difference of the two observations does not therefore amount to half a second! For all the purposes of practical navigation it may be regarded as nothing.

This very minute variation in the estimates of the astronomical distance