

TABLE II.—*Experiments upon the Friction of Axles upon their Bearings.*

		Ratio of Fric. to Pressure				
		Oil.	Lard	Tal- low.	Unct'us	
Wrought or cast iron upon	} {	Lubric renewing itself			} { .13 to .16	
Cast iron or bronze		" constantly renewed				
Bronze on bronze		" renewing itself				
Bronze on cast iron		" constantly renewed				
Lignum vitæ on cast iron	} {	" renewing itself			} { .153	
Lignum vitæ		" constantly renewed				
Cast iron		" "				
Wrought iron		" renewing itself				
on Lignum vitæ		.092	.070	.092	.100	
		.114	.135		.118	

A new Method of distinguishing between the Spots of Arsenic and Antimony obtained in the Apparatus of Marsh. By FRESSENIUS.

Extracted from Wöhler and Liebig's *Annal. der Chemie* for September, 1842.

The description of the apparatus devised by Mr. Marsh for the detection of arsenic, in the case of suspected poisoning by a preparation of that metal, and the method of its use, will be found in full in a former number of our journal, (*Jour. Fr. Inst.* vol. xviii, p. 338, 2d ser.) The great liability to error with this apparatus, lies in the difficulty of distinguishing between the traces left by the two metals, arsenic and antimony, and the consequent doubt thrown on the results obtained. The following method, extracted from the *Annalen der Chemie und Pharmacie*, for September, 1842, seems to us the most simple and unexceptionable for the supplying of this want, and the perfection of the apparatus, as an agent in medico-legal inquiries.

Obtain marks, as distinct as possible, in the usual way with the apparatus, and proceed (changing occasionally the tubes) as long as spots are given.

Then remove the vessel in which the gas is generated, and substitute an apparatus for the generation of sulphuretted hydrogen, (being careful, of course, that the materials used are free from arsenic.) Pass the stream of this gas over the metallic spots, so slowly that the gas will just burn as it issues from the end of the tube, which is drawn out to a fine orifice.

While the gas is coming over, heat the tube by means of a spirit-lamp, beginning at the outer end of the apparatus, and passing the lamp slowly along in a direction contrary to the direction of the current of gas. By this means the metal, or metals, present are converted into sulphurets. When this conversion is perfect, remove the apparatus for the generation of sulphuretted hydrogen, and replace it by an apparatus for the generation of hydrochloric acid gas, interposing a larger tube, filled with cotton, between this apparatus and the tube in which the spots are contained. Let the stream of this gas pass

slowly along the tube, and the sulphuret of antimony, if any be present, will be dissolved instantaneously, if the spots be thin, and in a few seconds if they be thicker; for this substance is very volatile in an atmosphere of hydrochloric acid.

On the other hand, the sulphuret of arsenic, if any be present, will be unaffected, and, after all the antimony is removed, may be obtained by sealing the end of the tube, and filling it with aqua ammoniæ, by which it will be dissolved, and may be again deposited, by evaporation, in a watch-glass, or other convenient vessel, and may be subjected to any tests which the operator may think proper.

British and American Royal Mail Co.'s Steam Ship Hibernia.

We have great pleasure in noticing this magnificent steamer. On going on board of her at the Broomielaw, we were first shown into the main saloon, and were as much delighted by its elegant appearance, as we were struck by its great size. It is constructed on a plan introduced by Mr. Napier into the first Halifax steamers, being built upon the main deck, and extending from the mainmast to the taffrail, ample room being allowed on each side of it for conveniently working the vessel; the stanchions, or frames for its support, pass through the main deck to the second deck, and, being firmly fixed to both, render it perfectly secure.

On descending the first flight of stairs into the engine-room, a gallery, chiefly of malleable iron, which passes entirely round the engines, gives an excellent view of the whole machinery. The next flight leads to the starting stage, which is of open cast-iron work, and fills up the space between the engines. The last flight leads to the lower floor and boilers. The cylinders are $77\frac{1}{2}$ inches diameter, and 7 feet 6 inches stroke. The starting gear is very beautiful and effective; a large malleable iron wheel, highly polished, with appropriate handles, is keyed into a shaft, having on it a pinion which takes into a sector on the valve-shaft, enabling three men to work the large D valves easily. The handle for disengaging the eccentric rod throws the pinion into gear with the sector, as soon as the eccentric rod has cleared the pin, so that the starting wheel can never be driven round by the motion of the valve-shaft. The throttle-valve, injection-cock, and blow-through-valve-handles, are all within reach of the engineer at the starting-wheel, as is also the handle for throwing the expansion valve in or out of gear.

The counter, for registering the number of strokes, is worked by the air-pump-crosshead of the starboard engine, being placed in the arch of the framing above the air-pump. Opposite to it, on the corresponding arch of the larboard engine, is placed the clock. From this counter may be told at a glance the number of strokes that the engines have made, from the time of the vessel's leaving England, until her return from America. The side-levers are much shorter, in proportion to the length of the stroke, than is generally the case, and on this account the engines take up much less room. The levers are made, in this instance, of just sufficient length to allow of the air-