MISCELLANEOUS ITEMS.

It is proposed to hold an industrial exhibition at Glasgow in 1880.

The Silicate Paint Company, of London and Liverpool, have been awarded a medal for their paints, which also obtained most favourable notice at the Paris Hygienic Congress.

The Town Council of Ayr have resolved to expend £10 in a series of experiments in lighting the town with electricity, the council to supply the motive power from a steam engine at present stationed at the head of the harbour.

Load for a Man.—A curious set of experiments made in France developed some interesting facts in regard to the greatest average load for a man of great strength to carry a short distance. This was found to be 319 pounds; all a man can carry habitually, as, for example, a soldier his knapsack, walking on level ground, is 132 pounds, (an extreme load it would seem,) or he can carry an aggregate of 1,518 pounds over 3,200 feet as a day's work, under like circumstances. If he ascend ladders or stairs, as do hod-carriers, then he can carry but 121 pounds continuously, and his day's work cannot exceed 1,232 pounds raised 3,300 feet high. With regard to the effort and the velocity with which a man can produce by pulling or pushing with his arms, it has been found by these experiments that, under the most favorable circumstances, and for continuous work, an effect cannot be gained exceeding from 26.4 to 33 pounds raised from 1.8 to 1.2 feet per second, or about one-eighth horse-power.

Ancient Surveying.—Two documents of great interest to geometricians have been discovered among the contract tablets in the British Museum. Attached to two terra-cotta deeds of sale of estates near Babylon are neatly drawn plans of the property. One sale took place in the reign of Darius Hystaspes; one toward the end of that of Nebuchadnezzar. The latter deed relates to a plot about 8½ acres in area, bounded on the north side by the canal of the goddess Banituo. The names of the owners of all the adjacent lands are given, and the greatest care is taken in giving the dimensions of these plots of land. The whole is divided into three pairs of parallelograms, and check dimensions are taken to test the accuracy of the work. A semi-circular portion of the east side is most carefully measured, both radius and circumference being given. The value of these documents as bases by which to fix both the linear and area measures in use in Babylonia is very great.

Wire Tramway Worked by Water-Wheels.—The tramway connecting the town of Lausanne with its harbor Ouchy, on the lake of Geneva, consists of two lines of rail, and two trains which are connected by a wire rope. At the top of the tramway the rope passes over a winding drum, through which the trains are put in motion. The two trains keep each other in equilibrium, the one ascending upon one line while the other descends on the other line, and *vice versa*.

The tramway is 1650 yards long, and leads in a straight line from Ouchy up to Lausanne, passing on the way a tunnel several hundred yards in length. The steepest gradient is 1 in 9.

The winding drum is driven by two Girard turbines, which work under a head of 393 feet; they are made of brass on account of the high velocity of the water, due to the great head; they have a diameter of 7 feet 4 inches, and run at a speed of 170 revolutions per minute. The water can easily de turned on and off the turbines by means of circular slides worked by hydraulic gear.

The two turbines are fixed upon a horizontal shaft, which carries also a break wheel, the band of which is worked by gears similar to the slides, and spur gear for transmitting the motion to the winding drum.

The winding drum is 19 feet 8 inches in diameter, and 13 feet long, and is covered with wood lagging. As it has to transmit by mere friction a force 180 H.P., making at the same time only a few revolutions per minute, the following arrangement to produce the necessary friction has been contrived by M. Callon, the designer of the tramway: the winding-drum is placed in a position parallel to the direction of the tramway, and considerably lower than the level of the rails, ; the rope is wound on the drum in two coils, and above the drum; the two ends of the rope are made to pass over the guide-pulleys, which stand at right angles to the drum, and are carried in sliding bearings. By means of bevel gear and screw spindles these pulleys are made to move too and from along the winding drum, thus forcing the rope to travel continually from one end of the drum to the other, and preventing the surface of the latter from being worn smooth, as it would be if the coil were always on the same spot.

PLUMBAGO AS A MOLDERS' "FACING."

We notice that the use of plumbago as a facing in molders' castings is exciting the attention of European metal founders. Although this material has been used to a considerable extent in this country for some time, it will doubtless interest our foundrymen to read what their European contemporaries say of it. We quote from letters written to the *Ironmonger* of London.

A founder in Cadiz, Spain, writes as follows: Having for upwards of thirty years, been casting church bells for different parts of Spain, also a great many for the Philippine Islands, I also had a great difficulty in finding a wash sufficiently strong to avoid the silver and tin employed in the bell metal penetrating into the loam, and causing an immense deal of trouble in the cleaning of the bell. Last week I cast a large bell for the cathedral here, to which I applied plumbago powder as a wash, mixed with whiting and salt. The result was more than I anticipated, as on taking the bed out, the loam left it without even the trouble of touching it, but dropped off of its own accord. I have also applied it to the casting of heavy gun metal castings and cast iron pieces, and in all it gave good results.

An English founder writes: We have carefully tried the use of Plumbago, both in our iron and in our brass foundries—with a decided benefit in the sharpness and face of iron castings—that is by using plumbago for dusting the molds. Plumbago pure and simple, and the better the quality of the plumbago the better the result; but in brass (yellow metal) and pot-metal castings neither the pure plumbago nor mixtures of plumbago and meal-dust, or plumbago and tan (or wood) ash was so satisfactory as would warrant its use in that way, whilst for heavy gun metal casting pure plumbago gives a clean face and a fine skin. The use of plumbago for yellow or pot metals we have found to be the best by first dusting the molds with pea meal, and then on that a slight dust of plumbago. With this we get splendid castings, quite equal to any American, both as to sharpness and cleanliness, admirably suited for steam valves to be left in the rough on their bodies, and effecting a very great saving in trimming and finishing polished goods.

Improvement in Soldering Irons.—A novel soldering iron, the invention of M. Paquelin, was recently described before the Academy of Sciences, Paris. Its distinctive feature is a platinum receptacle, in which heat is instantaneously generated with air and petroleum vapor or air and coal-gas.

Note on "Blowing Off" Steam Boilers.—In a French essay on the care of steam boilers, we find a note on the advantage of cooling off the arch after stopping and before "blowing off." It is as follows: Those who possess externally-fired boilers working only by day have all observed that the fire being covered at night, and the doors closed, the pressure rises during the night, often sufficiently to open the valves. This shows that the masonry, being at a much higher temperature that the boiler which it envelopes, imparts to it some of its heat. The same effect of heating the boilers by the masonry is produced to a less degree, it is true, but, nevertheless, to some extent on the outer jacket of internally-fired boilers. It is consequently injurious to empty boilers soon after having stopped them, because after emptying, the plates would be heated by the action of the masonry. It is well to admit a current of air through the flue some hours after the stoppage of the generator, and not to empty it before the flues have become cooled to a temperature below 150°. When the flues are not too hot, no serious inconvenience is experienced in emptying the boiler under pressure. We do not say at high pressure, as for a boiler the pressure of which would be 5 kilogs., the temperature of the water being 152°, a great quantity of steam would be generated during the process of emptying; we think that at a pressure at 1 kilog. the boiler could very well be emptied. In internally-fired boilers, as there is no masonry to cool in the furnace tubes, it would be preferable to admit the current of air intended to cool the masonry behind the boiler, as in this case the furnaces would not be cooled more rapidly than the jacket. We have sometimes seen owners empty their boilers almost immediately after the fires have been extinguished, clean them with cold water as soon as they were empty, and keep up a current of water so that the workmen might work there. Boilers of small dimensions sometimes resist this treatment, but in large boilers it will be seen that unequal contractions must take place which burst the rivets.