of the twirling brush, which caught my hair up and laid it down, and travelled all over my head with incessant gentle penetration. It crept down my whiskers and searching my beard with the same tender and decided effect. There was no scratching, not even of the neck and ears, but the skin of cheeks and chin was reached and swept. It was a new sensation. I felt as if I should like to be brushed continuously for a month.

A New Process of Engraving.

A M. Dulos has recently invented a new process of engraving, which is described by the *Moniteur Scientifique*, as follows:—A copper plate, on which the design has been traced with lithographic ink, receives, by the action of the pile, a deposit of iron on the parts untouched by the ink; the ink having been removed by means of benzine, the white portions of the design are represented by the layer of iron, and the black by the copper itself; the plate is then plunged into a bath of cyanide of silver, under a galvanic current, and the silver is deposited on the copper only. In this condition mercury is poured over the plate, which attaches itself to the silvered portions only, appearing in relief, and taking the place of the lithographic ink. Then take, in plaster or melted wax, an imprint, the cast of which, presenting the counterpart of the projections of mercury, gives a kind of copperplate engraving. This cast has not sufficient strength to bear the press; but by metallising the mould, and depositing upon it, electro-chemically, a layer of copper, we obtain an exact reproduction of the original projections of mercury, and, in some sort, of a martrix by means of which impressions of the plate may be produced *ad infinitum*.

For typographic engraving (figures in relief), the plate of copper should receive, on leaving the hands of the designer, a layer of silver, deposited only on the parts untouched by the lithographic ink; the ink is removed by benzine, the surfaces first covered by the design are oxidised, and the treatment above described is continued. At the end of the operation the raised portions of the electro-chemical plate intended for the impression will be found to correspond with the tracing of the design, and the hollow portions with the thickenings raised about the design by the mercury.

This process, which is the starting-point and the basis of M. Doulos' invention, has led him to the discovery of some more simple methods, which have led to important practical results, the fusible metal or amalgam of copper substituted for mercury giving rapid and remarkable perfect results.

Diameter of a Circle from which a Square or Hexagon can be made.

Workmen are often puzzled to find the diameter of a circular piece from which to make a square or hexagon of given size. The following rules are correct for the square:—Multiply the length of a side by 1·414213 and the product will be the diameter. For the hexagon multiply the distance across at right angles to the sides, by 1·1547 and the result will be the diameter. A slight allowance in excess should be made in order to insure sharp corners.

Practical Memoranda.

WEIGHT OF IRON.*

Square Iron.		Round Iron.		Flat Iron.		
Size.	1 ft.	Size.	1 ft.	Thick.	Width.	1ft.
Inch.	lbs.	Inch.	lbs.	in.	in.	lbs.
¼	0·2	¼	0·2	¼	1	0·8
⅜	0·5	⅜	0·4	¼	1¼	1·1
½	0·8	½	0·7	¼	1½	1·3
⅝	1·3	⅝	1·0	¼	1¾	1·5
¾	1·9	¾	1·5			
⅞	2·6	⅞	2·0	¼	2	1·7
				¼	2¼	1·9
				¼	2½	2·1
1	3·4	1	2·7	¼	2¾	2·3
1⅛	4·3	1⅛	3·4			
1¼	5·3	1¼	4·2	¼	3	2·5
1⅜	6·4	1⅜	5·0	¼	3¼	2·7
1½	7·6	1½	6·0	¼	3½	3·0
1⅝	8·9	1⅝	7·0	¼	3¾	3·2
1¾	10·4	1¾	8·1			
1⅞	11·9	1⅞	9·3	¼	4	3·4
				¼	4¼	3·6
				¼	4½	3·8
2	13·5	2	10·6	¼	4¾	4·0
2⅛	15·3	2⅛	12·0			
2¼	17·1	2¼	13·5	¼	5	4·2
2⅜	19·1	2⅜	15·0	¼	5¼	4·4
2½	21·1	2½	16·7	¼	5½	4·6
2⅝	23·3	2⅝	18·8	¼	5¾	4·9
2¾	25·6	2¾	20·1			
2⅞	27·9	2⅞	21·9	¼	6	5·1
3	30·4	3	23·9	⅜	1	1·3
3⅛	33·0	3⅛	25·9	⅜	1¼	1·6
3¼	35·7	3¼	28·0	⅜	1½	1·9
3⅜	38·5	3⅜	30·2	⅜	1¾	2·2
3½	41·4	3½	32·5			
3⅝	44·4	3⅝	34·9	⅜	2	2·5
3¾	47·5	3¾	37·3	⅜	2¼	2·9
3⅞	50·8	3⅞	39·9	⅜	2½	3·2
				⅜	2¾	3·5
4	54·1	4	42·5	⅜	3	8·8
4⅛	57·5	4⅛	45·2	⅜	3¼	4·1
4¼	61·1	4¼	48·0	⅜	3½	4·4
4⅜	64·7	4⅜	50·8	⅜	3¾	4·8
4½	68·4	4½	53·8			
4⅝	72·3	4⅝	56·8	⅜	4	5·1
4¾	76·3	4¾	60·0	⅜	4¼	5·4
4⅞	80·3	4⅞	63·1	⅜	4½	5·7
				⅜	4¾	6·0
5	84·5	5	66·8			
5⅛	88·8	5⅛	69·7	⅜	5	6·3
5¼	93·2	5¼	73·2	⅜	5½	6·7
5⅜	97·7	5⅜	76·7	⅜	5½	7·0
5½	102·2	5½	80·3	⅜	5¾	7·3
5⅝	107·0	5⅝	84·0			
5¾	111·8	5¾	87·8	⅜	6	7·6
5⅞	116·7	5⅞	91·6			
				½	1	1·7
				½	1¼	2·1
6	121.7	6	95·6	½	1½	2·5

* Hazlett's Hand-book.