till the precipitate formed at first is redissolved. It is necessary that this liquid should preserve a slightly acid reaction, and if it has lost it by too great an addition of sulpho-cyanide, it must be rendered so by adding a few drops of hydro-chloride acid. In order to gild, the silver is plunged into this liquid nearly boiling, and tolerably concentrated, in which state it is kept by pouring, from time to time, some hot water to replace that which has evaporated. In this manner, inconveniences which would result from too great concentration of the acid is avoided, whose pressure is, nevertheless, useful to oppose the formation of an auriferous precipitate which takes place by elevation of temperature, when alkali predominates.

To Gild and Silver on Copper, Brass, and Bronze.—The solution of the cyanide of gold, or silver, has been already pointed out for silvering and gilding under the influence of electric forces, but it has been found that the same solutions, brought to a temperature near their point of ebullition, can also gild and silver by dipping. With regard to their preparation, if it were necessary to obtain them chemically pure, it would be expensive, without any advantage being obtained; the operation can be simplified, and rendered much less expensive, by adding directly, either to the chloride of gold, or to the nitrate of silver, neutral, the cyanide of potassium in excess, so as to obtain the soluble double cyanides.

Silver cannot be gilt by this method, but as has been already stated, the sulpho-cyanide of gold and potassium gilds this metal very well.

The solution of the cyanide of copper in the cyanide of potassium, will not copper silver, even in contact with zinc; however, it will copper this latter metal in a very solid and perfect manner.

It must, however, be stated that these processes, though so very convenient, because they always succeed, and require but a few minutes for their preparation, deposit, unfortunately, but a very thin coating of the precipitated metal. This is an inconvenience common to all methods of coating by simple immersion.

Civ. Eng. & Arch. Journ.

Hullmandel's Lithotint Process. By B. ROTCH, Esq., V. P.

From the time of Senefelder, who invented lithography, in 1796, up to the present day, this beautiful art has gone on gradually improving; but in no instance has so important a step been made as in that of Mr. Hullmandel's process of producing original drawings, or fac-simile copies as may be required. Previously to the lithotint process being introduced, crayons made of a composition of grease, wax, shellac, soap, and black, were used for a similar purpose.

Mr. Hullmandel's process, which is the result of numerous experiments, may be thus described:—The drawing having been sketched, tinted, and finished by the artist on stone, with lithographic ink mixed with water, to produce the various shades, which is as easily done as on paper, is covered over with gum-water, and weak nitric acid to fix it. After remaining a sufficient time to dry, a solution of rosin in

spirits of wine, is poured over the stone, and as this ground contracts by drying, it cracks into thousands of reticulations, which can only be discovered by the use of a microscope. Very strong acid is then poured over the aquatint coating, which, entering all the fissures, produces the same effect on the stone as the granulations of the chalk by the ordinary process. The rosin protects the drawing in every part except in the cracks. The acid having remained a sufficient time to act on the unprotected parts of the drawing, is removed, the ground is washed off, and all appearance of the subject on the stone vanishes, until ink being applied by a roller in the ordinary way, it is reproduced, and ready for taking off the required number of impressions, which, in some cases, have extended to the number of 2000.

Trans. Soc. Arts, Manuf. and Com.

Lunar Occultations.

Lunar Occultations visible in Philadelphia during the month of April, 1844; computed by MRS. CHARLOTTE S. DOWNES, from the Elements published with the Occultation list of the United States Almanac.

The Immersions and Emersions are for Philadelphia, mean astronomical time. Im. for Immersion, Em. for Emersion. These abbreviations in *Italics* refer to those Immersions and Emersions which take place on the Moon's dark limb. N. App. for Near Approach.

The angles are for *inverted image*, or as seen in an astronomical telescope, and reckoned from the Moon's North point and from its Vertex around through East, South, West, to North and Vertex again. For direct vision add 180° .

APRIL, 1844.

Day.	H'r.	Min.	Star's name.		Mag.	From North.	From Vertex.
5	17	1	Im.	δ Scorpii,	3	27°	11°
5	17	31	Em.			342	311
19	21	9	Im.	MARS,		32	87
19	21	58	Em.			299	354
20	6	13	Im.	α^1 Tauri,	5.6	32	337
20	6	48	Em.			334	278
20	6	2	Im.	α^2 Tauri,	6.7	62	5
20	7	3	Em.			304	249
20	7	59	Im.	Bessel,	8	119	66
20	8	52	Em.			248	197
21	7	35	Im.	η Tauri,	5.6	159	103
21	8	7	Em.			213	163
22	7	4	Im.	Bessel,	8	104	50
22	8	15	Em.			285	229
22	8	16	Im.	Bessel,	9	147	91
22	9	2	Em.			241	186
22	8	21	Im.	Bessel,	9	121	68
22	9	29	Em.			268	213
23	7	33	N. App.	Bessel.	9	$\nearrow$ N. $4^{\circ} 5'$	
23	10	4	N. App.	Bessel,	8	$\nearrow$ N. $1^{\circ} 9'$	
23	10	53	Im.	Bessel,	9	83	31
23	11	42	Em.			310	262
23	11	23	Im.	Bessel,	8	153	103
23	12	1	Em.			67	192
23	11	11	Im.	Bessel,	9	99	48
23	12	5	Em.			294	247
24	9	50	Im.	972 Bailey,	7	100	47
24	10	42	Em.			304	251