



XXXIX. M. Montgolfier's process for making white lead

Messr. Clement & Messr. Desormes

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excellent optician Mr. Ramsden, by the combination in the best position of two plano glasses, with their convex sides to each other, applied eye-pieces to his instruments with great advantage, to read off divisions of his circles, and magnify the wires of his telescopes with clear definition at the circumference of the field of view, the diameters of the glasses being no larger than the aperture of the tube. The same principle has since been advantageously applied to large object lenses for the lucernal microscope, by the late Mr. G. Adams and ourselves, where the diminution of light was of less consequence than indistinctness of the images. In many cases the combination of two convex lenses answers well; but the combining of two similar plano-convex lenses together, of superfluous diameter and thickness, and for the greatest defect or aberration, in the worst position to each other, and afterwards to palliate it with a small aperture, as shown in fig. 4, (Plate IV.) is such an anomaly or absurdity in optics as not to require any serious comment on my part. I shall only appeal to the least experienced constructor of microscopes, whether he does not know that the substitution of a double convex lens, of the diameter only of Dr. Wollaston's aperture, and of the same focus, would produce an image infinitely more perfect and vivid than the mutilated lens proposed by Dr. Wollaston.

From these remarks, I presume, there will be nothing to apprehend from the attempt of Dr. Wollaston to depreciate the excellence of the spectacles, camera obscuras, and microscopes, which have been constructed by the most eminent opticians of the day.

Yours, &c.

Holborn, April 13, 1813.

WILLIAM JONES.

XXXIX. *M. MONTGOLFIER's Process for making White Lead. By Messrs. CLEMENT and DESORMES*.*

THE celebrated Montgolfier's process for the manufacture of white lead, being one of great simplicity, ought to be better known; and with this view we have drawn up the following description.

The first operation consists in forming the lead into sheets. He found from experience, that by running the melted metal on ticking, the sheets might be made of any thinness, and varied at will, by inclining the frame a little

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more or less. The surface then becomes a little irregular, and full of points; which is favourable to the oxidation that follows. On this operation we need not insist, the process being already well known.

The second operation consists in oxidizing and carbonizing the lead. The following is the disposition of the apparatus:

M. Montgolfier had a common chemical reverberatory furnace, in which he burned charcoal. The chimney on its dome was four or five metres high, and, taking a horizontal direction, was introduced into an opening in the end of a cask (which lay on its side) a little above its centre. Some vinegar was put into the lower part of this cask, and towards the centre of its other end was adjusted another tube, equal to the chimney, and communicating by its other extremity with a large rectangular case in which were suspended the sheets of lead, alternately high and low, that the air might pass entirely over their whole surface. The other end of this case had an opening to allow the redundant gas to escape. The case had a cover, which could be removed at pleasure, for the purpose of placing the sheets of lead on small pieces of wood prepared to receive them.

The air from the furnace, being thus made to pass through the cask containing the vinegar, by communicating heat to the vinegar carries it off in vapour, and passes with it through the case containing the sheets of lead, which of course are exposed to the action of acetic acid, of carbonic acid from the combustion of the charcoal, and of oxygen and azote, or atmospheric air which has escaped the action of the fuel, and which may be augmented at pleasure by leaving holes towards the middle of the chimney to admit fresh atmospheric air. Thus are combined all the circumstances necessary to the production of carbonate of lead—oxygen, carbonic acid, vinegar, and heat.

In a short time the sheets of lead become charged with a coat of carbonate. If their entire conversion into carbonate at a single operation is not intended, they are withdrawn from the case, and suspended in water: the white lead readily detaches itself, and falls to the bottom. If the sheets are left till wholly converted into carbonate, still they must be put in water; and, besides, the deposit must be levigated to separate the metallic particles which may have escaped oxidation, and which would tarnish the white colour.