

LIII. *Experiments on the comparative Effects of Solutions of Magnesia, of calcareous Earth, and of Alum, in dying Cloths of various Kinds with Madder, &c. By Mr. VOGLER.*

FROM CRELL'S CHEMICAL ANNALS.

PURE magnesia, properly prepared from Epsom salt, (*Magnesia Vitriolata*,) and thoroughly washed, was thrown gradually into oil of vitriol, into spirit of nitre, and into spirit of salt. Each of these acids quickly dissolved it, (without the assistance of heat,) with effervescence; and the solutions continued clear, until the acid was completely saturated. A portion of the earth then separated, part of which remained suspended on the surface of the liquor, the other part fell to the bottom. None of this appeared capable of being dissolved, either by the addition of more acid, or by the addition of water, or by the application of heat.

Each

Each of the above-mentioned solutions of magnesia was diluted with three times the quantity of pure water. Woollen, silk, linen, and cotton cloths, all which had been first clean scoured, and dried, were then put into these solutions, and left to soak therein for the space of ten or twelve hours. At the end of that time they were taken out, washed in three separate quantities of clean cold water; then wrung out and dried.

I now set over the fire three deep earthen pots, in each of which I put two drachms of madder, and about a pint (from twelve to fourteen ounces) of clean soft water. After they had boiled for a few minutes, I put into one of the decoctions, the pieces or samples of cloth, of different kinds, which had been prepared and soaked in the solution of magnesia made with oil of vitriol. Into another, I put those pieces which had been soaked in the solution made with spirit of nitre; and, into the third, I put those which had been soaked in the solution made with spirit of salt. When these pieces of cloth had boiled therein for the space of seven or eight minutes, (during which time they were frequently turned about and pressed with a stick,) they were taken out of the decoctions, and, after being two or three times wrung out of clean cold water, were dried in the shade. The

wool and filk appeared to be dyed throughout of a bright brown colour; the linen and cotton were of a pale red.

Experiments fimilar to the above were at the fame time made with folutions of calcareous earth, in the vitriolic, nitrous, and marine, acids. The colours communicated to the cloths prepared in thofe folutions, and afterwards boiled in a decoction of madder, were found to differ very little, or not at all, from thofe obtained by means of the folutions of magnesia.

In the fame manner I found, by repeated experiments, that alum, and the folutions of its earth in the different acids, gave (when ufed in dying with the decoction of madder) a light brown colour to wool and filk, and a red colour to linen and cotton. But it muft be confefsed, that thefe colours were brighter and finer than thofe produced with the folutions of magnesia, or with thofe of calcareous earth.

It appears, therefore, from the above and other comparative trials made with folutions of the aluminous, magnesian, and calcareous earths, in dying cloths of different kinds with madder, logwood, brazil-wood, &c. that no advantage is derived from the ufe of the two laft; as alum and its folutions produce finer colours, and confequently

quently may at all times be employed in preference to the others.

It would perhaps have been worth while to have tried, in the same manner, the effects produced by solutions of barytes or heavy earth, and likewise those of manganese (when freed from heterogeneous matter) and its calx, in dying cloths of different kinds with the above-mentioned substances; but, not possessing a sufficient quantity of the barytes, and not having had time and opportunity to prepare pure manganese and its calx, I have not yet been able to undertake a course of experiments on that subject.