

Artificial Rain.

AFTER the magisterial words of Prof. Cleveland Abbe, as reported in your issue of December 13, 1900, it requires some courage to offer a possible instance of "artificial" rain. I was near Bolton Abbey railway station on November 26 last. The atmosphere was perfectly calm, and a thin white mist enveloped the landscape. A number of land-blasting explosions took place in some limestone quarries, perhaps a quarter of a mile away. At a very short interval after these there occurred a very little shower or sprinkling of rain, just sufficient to cause me to put up my umbrella in preparation for more. The extreme brevity of the shower, and the peculiar conditions under which it occurred, arrested my attention, and led me at once to refer it to the explosions which had just taken place.

Keighley, December 22, 1900.

C. H. B. WOODD.

IN an article on artificial rain in your issue of December 13, 1900, Prof. Abbe alludes to "the popular belief that rain follows great battles," which is now often—incorrectly, as the article points out—explained by and used as an indication of some effect produced on the clouds by the explosion of the gunpowder.

It is interesting in this connection to observe that the belief about rain following battles was held many centuries before the invention of gunpowder. Plutarch, in his life of Caius Marius, writes:—"It is observed, indeed, that extraordinary rains generally fall after great battles: whether it be that some deity chooses to wash and purify the earth with water from above; or that the blood and corruption, by the moist and heavy vapours they emit, thicken the air, which is generally liable to be affected and altered by the smallest cause." (Langhorne's translation). The inference is that the belief was the result of a preconceived idea, and that the gunpowder explanation was therefore wasted on a theory which was not grounded on observation at all.

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M. T. TATHAM.

PROGRESS IN METALLOGRAPHY.

THE application of micrographic analysis to the study of alloys has given to the metallurgist a new and important field of investigation, and every improvement in the established methods is worthy of attention. Some of the latest suggestions are made by M. Henri le Chatelier in the *Bulletin de la Société d'Encouragement* for September last, the most noteworthy being in connection with the final stages of polishing. It is necessary for this work that the polishing powders should be perfectly classified according to the dimensions of the particles. The method of sorting by means of levigation, described by M. Osmond, is defective, owing to the fact that the salts of lime in ordinary water cause coagulation and rapid deposition of minute particles suspended in water. Caustic lime and acids induce even more rapid settling, a fact that has proved of great commercial importance in the treatment of ore slimes by cyanide in South Africa.

To overcome this difficulty the powders are heated with nitric acid, washed thoroughly, and allowed to settle in distilled water containing 0.2 per cent. of ammonia. When treating ten grams of powder in a litre flask, nine-tenths of the liquid are siphoned off at the following intervals of time: a quarter of an hour, one hour, four hours, twenty-four hours, and eight days. The third deposit is useful in polishing hard metals such as iron, but the fifth and last deposit affords the best polishing powder. Minute care is taken to avoid any admixture of dust or dirt with these powders, which can now be bought in Paris mixed into a paste with soap, and contained in tin tubes such as are used for oil colours.

A number of materials for the manufacture of these powders have been tried. M. Le Chatelier finds that alumina prepared by calcining ammonium alum is the best, as far as speed of polishing is concerned; but oxide of chromium, obtained from the combustion of bichromate

of ammonium, answers fairly well in the treatment of iron and steel, and is better than alumina for soft metals such as copper. Oxide of iron is far less advantageous than these substances, its action being very slow. The soap

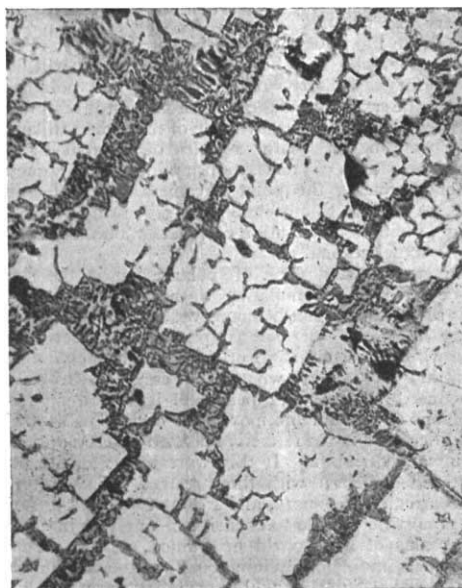


FIG. 1.—Crystals of Al_2Cu .

preparations are applied in the ordinary way to discs of wood or metal covered with skin or cloth and capable of being revolved at high velocity, the whole operation of polishing proper being carried through by their aid in five minutes.

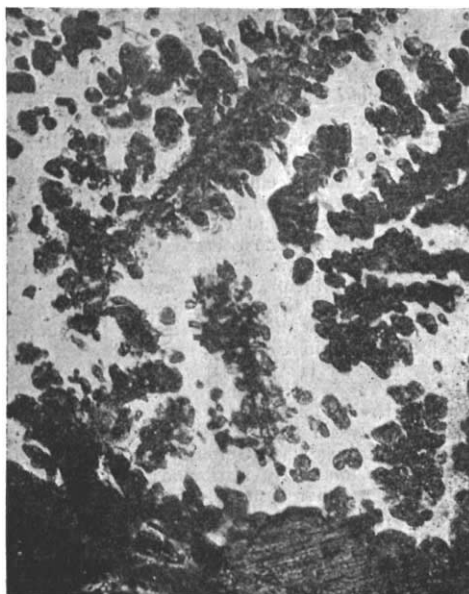


FIG. 2.—Compound pearlite AlCu .

For examining and photographing the polished and etched specimens under the microscope, M. Le Chatelier proposes the use of monochromatic light such as that derived from an electric arc in mercury vapour, with