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LI. *On the Cause of the Production of Daguerreotype Pictures.*
By MARTYN J. ROBERTS, Esq.

To the Editors of the Philosophical Magazine and Journal.

GENTLEMEN,

ALTHOUGH the Daguerreotype process has long excited intense interest in the scientific world, we have not as yet had an explanation of the wonderful effects produced. I believe that even M. Arago has failed to elucidate the theory; and not only has this great philosopher been foiled, but the inventor of the process is unable to solve the problem; with these facts before me, I feel it almost presumptuous in so humble a votary of science as myself to attempt an explanation of the cause of the production of Daguerreotype pictures, but if my attempt has the effect of directing attention to the right path for arriving at a solution of the question, I shall be satisfied. We all know that light has a powerful influence on crystallization; solutions that will not crystallize in the dark instantly form on the admission of light; the crop of crystals is always more copious on the enlightened side of a glass containing a crystallizing liquid than on the dark side. Ice forms more rapidly during moonlight, and on the break of day, than on a dark night; but I need not adduce examples of the influence of light on crystallization, for the fact is allowed by all scientific men.

Let us then suppose, that in the Daguerreotype process the cleansed silver plate is exposed in the dark to the vapour of iodine; this deposits itself in a flocculent or powdery state on the plate, unable to form the peculiarly shaped iodic crystals, from the absence of light; but yet all other requisites being present, it may be considered in an incipient state of crystallization, or balanced so finely, that the admission of the excitant light instantly throws it into plate-formed iodic crystals, but only in those parts where the light has impinged, and here its perfection of, or continuity of crystallization, is merely in proportion to the intensity of light.

Having now the iodated plate removed from the camera obscura, where it has undergone a surface crystallization, more or less perfect in those parts where the lights and shades have fallen, we submit it to the mercurial vapour; the atoms, vesicles, or globules of this vapour being very minute, attach themselves to all the minute inequalities of face in the iodine; on those parts which are fully crystallized, the vapour is precipitated on the flat tabular surface of the crystals, and here offering a continuous and equal angle of reflection to the eye

it appears white and resplendent. On the non-crystallized or imperfectly crystallized surface of the iodine, which being in a measure powdery and offering no determinate angle of reflection to the eye, the mercurial vapour adheres, but in no flat surface or continuous determinate angle capable of reflecting a mass of light; it may be said it is here unpolished.

Again, may not the angle under which it is necessary to view a Daguerreotype picture be that of the facet of the iodic crystal, and this be a further confirmation of my theory? The mercurial vapour covers the whole of the iodine, and thus protects it from the further action of light.

Such are the crude views I have formed on this subject, and I trust they may lead to a further elucidation.

I am, Gentlemen, yours, &c.

London, March 19, 1841.

MARTYN J. ROBERTS.

LII. *Notices respecting New Books.*

A System of Crystallography. By JOHN JOSEPH GRIFFIN. Glasg. 1841.

WE have been favoured with a copy of a work bearing the above title, but which might better have been called "A description of 120 porcelain models of crystals, according to a method newly invented by the author"; for, with regard to Crystallography, we might, on first turning over the uncut leaves, and meeting with zenith and nadir of crystals, and north-east, north-west, and other meridians, have supposed that the object of the book was to create a laugh at the expense of the cultivators of that science; but recollecting the cost of publishing a rather bulky octavo volume, we felt compelled to suppose the author serious, and we accordingly began at the preface to separate some of the leaves.

The first line of the treatise defines crystallography to be "the art of describing crystals." But this, according to our notions on the subject, is only one, and not the most important of its objects. We have been accustomed to regard crystallography as a science of a much higher order, by which the mineralogist is enabled, from a fragment of a crystal, to discover its relation to some simple type by which he may connect it with the species of mineral to which it belongs.

This view of the subject, however, does not appear from the above definition to have entered into Mr. Griffin's contemplation, and his system therefore, even if it possessed the merit he ascribes to it, would render no additional service to mineralogy.

We cannot afford either time or space for even a brief analysis of the author's method, nor do we conceive that we should much benefit our readers by giving it; we shall therefore limit ourselves to a few extracts and remarks.

The preface begins thus: "There are many systems of crystallography in print, but none in general use," a fate from which we