On the artificial production of hydrophane

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To cite this article: M. Ebelmen (1845) On the artificial production of hydrophane, Philosophical Magazine Series 3, 27:181, 404-405, DOI: [10.1080/14786444508645310](https://doi.org/10.1080/14786444508645310)

To link to this article: <http://dx.doi.org/10.1080/14786444508645310>

Published online: 30 Apr 2009.

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ON THE ARTIFICIAL PRODUCTION OF DIAPHANOUS QUARTZ.

BY M. EBELMEN.

When either of the two silicic æthers which I have recently described* is exposed to the continued action of a moist atmosphere, the liquid finally solidifies to a transparent mass. This product, very delicate and fragile in the first days after its solidification, contracts more and more under the influence of the moist air still remaining diaphanous. Two or three months are requisite in operating on 5 or 6 grms. of æther, for the substance to cease to lose in weight and for its molecular movement to terminate. The substance prepared as above is hard, faintly scratches glass, and possesses great cohesion; its lustre, its fracture and transparency are perfectly comparable to the most beautiful rock crystal. Its density is 1.77. It is a hydrate, which contains twice as much oxygen in the silica as in the water, the formula of which is consequently $(\text{SiO})^2 \text{HO}$.

It is essential, in order that the product may not become fissured during the contraction it experiences before attaining the definite formula $(\text{SiO})^2 \text{HO}$, not to allow the moist air to enter except by an aperture of very small diameter. During the whole of the experiment the flask containing the silicic æther exhales an alcoholic odour, which persists a long time after the solidification, proving that only a portion of the organic matter had separated from the silica when the solidification took place. The contraction proceeds the more slowly the less easily the moist air is renewed in the apparatus, and this slowness appears indispensable to the success of the operation.

From the properties of the hydrate of silica, we may be allowed to hope that it may be turned to advantage in the construction of optical instruments. It is my intention to make some experiments in this direction.—*Comptes Rendus*, Aug. 25, 1845.

ON THE ARTIFICIAL PRODUCTION OF HYDROPHANE.

BY M. EBELMEN.

By slightly modifying the process for the preparation of hydrate of silica, described in the preceding paper, there is obtained, instead of a diaphanous product, an opaque substance, which becomes entirely transparent when placed in water, in a word, true hydrophane. It suffices for this purpose that the silicic æther employed retain a little chloride of silicium, which happens when an excess of alcohol has not been employed in the preparation of the æther. On exposing this æther, still somewhat acid, to the action of moist air, there is obtained a solid mass, which is at first transparent, but ends by becoming opaque after some weeks' exposure to the air. The translucidity of this substance is so much the less the greater the proportion of the chloride of silicium in the æther. Some of the fragments have the semi-transparency of opal. They all become entirely transparent in water.

* See Phil. Mag. vol. xxv. p. 397.

We are therefore able artificially to reproduce hydrophane, this rare variety of quartz, and the curious property of which had struck mineralogists.

A very small proportion of foreign substances suffices in fact to modify the translucidity and the appearance of the hydrate of silica; thus a small flask containing silicic æther having been closed by mistake with a cork, which belonged to a bottle full of creosote, the æther, on becoming coagulated under the action of moist air, yielded a slightly yellowish silica, and merely translucent like chalcedony; the product thus obtained was not hydrophanous.

I propose to continue and to vary these experiments, which appear to me of great importance and of considerable interest.—*Comptes Rendus*, Sept. 1.

IMPROVEMENTS IN PHOTOGRAPHY.

To the Editors of the Philosophical Magazine and Journal.

GENTLEMEN,

From the many able papers which occasionally appear in your Journal on photography, by Sir J. Herschel, Messrs. Talbot, Hunt and others, I am induced to believe that any facts bearing on that most interesting subject will be welcome. I therefore hasten to communicate them for the information of your numerous readers.

My attention has lately been directed to ascertain what other substances besides chlorine and bromine, separately and combined, possessed the property of accelerating the action of light on a Daguerrean or iodized plate; and after many trials, I found that the vapour of ammonia possesses this singular quality in a very remarkable degree. I first employed it with iodine alone, by simply iodizing a plate to a full yellow colour, and then exposed it for a few seconds to the vapour of ammonia in an exceedingly attenuated state by adding a few drops of strong ammonia to a little water, just sufficient to recognise it by its odour; thus prepared it was placed in the camera, and produced a perfect impression of a building in half a minute in moderate sunshine; and several other experiments satisfied me that ammoniacal vapour has a very quickening action on iodine alone. My next step was to ascertain how it would operate with bromine; expecting it would either destroy or accelerate its action, I was rejoiced to find that it had the latter effect, and that plates prepared in the usual manner, with iodine and simple bromine water, are rendered infinitely more sensitive by exposing them a few seconds to this vapour than they are without it. Having found that I could obtain a perfect impression in sunshine instantaneously, and that five or ten seconds only were sufficient in a moderate light, I indulge the hope that, with its assistance, moving objects may therefore be taken with facility. I should inform you that I have employed this substance in a variety of shapes, by exposing the plates to its influence previous to placing them in the camera, or by allowing it to be evolved in it during the operation, or just before it is used, and in each case have found it equally efficacious. What is remarkable