the same quantity of acid be added at once, not the smallest quantity of silica is precipitated.

2. That the silica, having been once precipitated, is not re-dissolvable in the acids, whatever may have been its origin, whether precipitated from an alkaline silicate by an acid, or from fluoride of silicium by means of water.

3. That the weaker acids, such as carbonic, sulphurous, boracic and the vegetable acids, decompose the alkaline silicates at ordinary temperatures, and precipitate the silica either in white powder or gelatinous flakes.

4. That the silica in a state of minute division, either anhydrous or hydrated, is capable of decomposing the alkaline carbonates in solution in water, at the boiling point, dissolving in the fluid.

5. That the silica precipitated at the ordinary temperature, from a solution of an alkaline silicate or the fluoride of silicium, is a hydrate of definite proportions, of which the composition may be expressed by the formula HO, Si O^2 ; that this hydrate, at the temperature of 100° , loses one equivalent of water, and is changed into another, composed HO, 2Si O^2 .

6. That when a solution of an alkaline silicate is treated by a metallic solution, there results a precipitate consisting of a mixture of hydrated silica and metallic silicate:—that the metallic silicate is entirely dissolved by the mineral acids, while the free silica remains undissolved.

7. That a limpid solution, highly charged with silica in hydrochloric acid, may be obtained by dissolving in that acid the silicate of copper, and precipitating the copper by sulphuretted hydrogen.

8. That the solution of silica in hydrochloric acid, evaporated slowly under an air pump, yields hydrated silica (HO, Si O^2) perfectly crystallized in very slender and transparent acicular crystals, grouped together in stars or tufts.

Ibid.

Experiments upon the Crystallization of Carbon. By M. CAGNIARD LATOUR.

Translated for the Journal of the Franklin Institute.

More than ten years ago, I presented some diamonds to several members of the Academy of Sciences, informing them at the time that these diamonds had been produced by means of a process invented by me, because I then believed it. As I now acknowledge that I was mistaken, I consider it a duty to declare it to the Academy.

The only somewhat remarkable substances that I obtained in my own experiments upon the crystallization of carbon, were microscopical laminæ or scales, of a circular form, very thin, transparent, and colorless, the largest of which were hardly the twenty-fifth part of a millimetre in diameter.

Their production being difficult, I have not yet been able to obtain a quantity sufficient to enable me to determine their composition; but it nevertheless seems allowable to consider them as having some ana-

logy with the diamond, inasmuch as in the divers experiments which, with the aid of the microscope, I have made upon these laminæ, and of which the number was about 160, the general results were as follows: 1. The hydrate of potassa in fusion has no action upon them at a temperature in which this alkali acts briskly upon silica. 2. They are sufficiently hard to scratch glass. 3. They entirely disappear when brought to a red heat in the open air.

These scales were produced in the two experiments of which I have given the details in a memoir which I have this day had the honor to submit to the Academy.

Ibid.

The Difference which Exists between Gilding by Mercury and Electro-Gilding. By M. BARRAL.

The author of this paper says that he has been frequently called upon to solve the following question, viz. :—"By what means had a certain article of copper or silver been gilded?" This could not possibly be ascertained with certainty by mere inspection, even by the most experienced eye. M. Barral has, however, discovered a certain means of ascertaining the fact by chemical reaction. He has found that by attacking the articles to be tested with dilute nitric acid, either warm or cold, pellicles of gold are obtained, of the exact form of the article; provided the acid be not allowed to act too energetically. These pellicles are of a yellow gold color on both sides, when obtained from articles gilt by simple immersion in an alkaline solution of gold, or by means of the galvanic current decomposing certain solutions. On the contrary, the pellicles produced on the surfaces of articles gilt by mercury are of a reddish-brown color on the side next the surface of the articles gilt.

In order to explain this difference in the appearance of the pellicles of gold, M. Barral first had certain articles gilt by the mercury process with certain quantities of gold. The articles thus gilt, on being acted upon by dilute nitric acid, furnished pellicles of gold of a deep brown color on their inner faces, and heavier than the gold originally employed in the gilding process. The pellicles not dissolved by the acid were therefore not pure gold.—They were proved by direct analysis to contain about three per cent. of copper or silver, according to which of these two substances the gilt article was formed.

M. Barral therefore considers it evident that when the amalgam of gold is applied to the surface of an article, a double amalgam of gold and copper or silver is formed. If the article be then submitted to heat, the mercury will be volatilized, and an alloy will be formed, thereby uniting the precious metal and the metal of which the article is formed. If the article gilt be then acted upon by nitric acid, the metal of which it is formed will be completely dissolved, and the acid will act upon the alloy, and carry off the copper or silver near the inner surface, where the gold is in small quantity. But, as the proportion of gold increases near the outer surface, it will preserve the other