Herrick has remarked, "some of them have doubtless been concealed by clouds, and others witnessed only by barbarians."

But between the great display of B. C. 687 and A. D. 1803, Professor Newton gives the following list of showers at or near the epoch of April 20,[7] viz.: B. C, 15, A. D. 582, 1093, 1094,[8] 1095, 1096, 1122 and 1123. The appearance of 582 ought probably to be rejected. It was two days from the epoch, and the record as quoted by Quetelet may have no reference to shooting stars.[9] The three remaining returns, B. C. 15, A, D. 1093-1096, and 1122-3, indicate a period of about 27 years. Now it is obvious that, at every close approach of meteors to the earth, many must be thrown into new orbits, all of which will pass through the point at which the perturbation occurred. It seems probable, therefore, that at some remote epoch a considerable cluster of this meteoric stream was thrown by perturbation into a new orbit corresponding to a period of 27 years. The change may have been produced by the earth during the passage of the meteoric swarm.

The facts which we have considered apparently indicate that the first comet of 1861, and the April meteors, formed a system in space before entering the solar domain; the latter moving in advance of the former at a distance comparable to the diameter of Neptune's orbit. By planetary perturbation the orbits were transformed into ellipses. If, as supposed by Professor Forbes, the disturbing body was an ultra-Neptunian planet in the vicinity of the present aphelion of the comet's orbit, said planet would probably describe less than 20° of its circuit during the interval between the nearest approach of the two bodies. But in aphelion the comet 1861 I, is too remote from the plane of the ecliptic to be sensibly disturbed by a planet moving in that plane. It seems more probable that the comet, as well as the meteoric group, owes the transformation of its orbit to one of the known major planets. Its radius vector when at its ascending node is about 10. In other words, its orbit approaches very near that of Saturn in longitude 30°. Now, it is remarkable that the interval between the perihelion passages of the meteors and the comet is almost exactly equal to two periods of Saturn. The meteors and Saturn were in the same longitude and in close proximity about B. C. 683, and the comet approached very near the planet at the same point about B. C. 625. The orbits may have been transformed into ellipses by Saturn's influence at these respective epochs. It may be worthy of remark that 11 times the period of the comet are equal to 155 times that of Saturn.

CHEMICAL NOTES.

On Ballo's Supposed Adipic Acid Obtained from Camphor.—On oxidation with chromic acid camphor does not yield adipic acid, but the same oxidation-products as with nitric acid. Chromic acid, however, converts the camphoric acid first formed completely into members poorer in carbon.—J. Kachler.

On the Remarkable Reducing Properties of Potassium Ferrous Oxalate, and on some of the Reactions thus Produced.—Ferrous oxalate is very permanent on exposure to the air, both in a wet and a dry state, and possesses very feeble reducing properties. The solution of ferrous oxalate in potassium oxalate, as well as the solid double salt, takes up oxygen greedily, and passes into potassium ferric oxalate. Its affinity for oxygen is equal to that of an alkaline ferrous hydrate, or of ammoniacal cuprous chloride, or of pyrogallic acid in an alkaline solution. The double oxalate exerts its reducing powers, not merely in alkaline, but in neutral, and even acid solutions. The solution quickly reduces platinum chloride and silver nitrate to metal. Silver chloride, bromide, and iodide are reduced completely, but more slowly. Copper acetate is reduced very slowly to cuprous oxide, and even to metal With the aid of heat mercuric chloride is reduced to metal. Recently precipitated Prussian blue is reduced to white ferro-cyanide of potassium. Indigo blue is reduced to white indigo, and solutions of sulphindigotic acid are rapidly decolorised.—J. M. Eder.

On the Acids $C_8H_{14}O_4$ Formed from Butyric Acid. Besides a volatile oily acid, probably identical with isocrotonic acid, there are formed by the reaction of suberic and bromobutyric acid, two acids agreeing in composition with suberic acid, but distinctly different from each other, and from the two isomeric acids produced by a corresponding reaction with brom-isobutyric acid. There exist, therefore, five isomeric suberic acids.—Carl Hell and O. Mulhauser.

A New Synthesis of Phosphenyl Sulpho-Chloride.—Twenty parts phosphenyl-chloride are placed in a small flask with a reflux condenser, and five parts sulphur-chloride are slowly added by means of a dropping-funnel. After the reaction is over, the flask is set in a freezing mixture of Glauber's salt and hydrochloric acid. Pale yellow crystals of phosphenyl-tetra-chloride are formed, from which the liquid is separated by decantation, then shaken with water, dried and rectified. The yield is almost quantitative.—H. Koehler.

More Particular Observations on the Action of Potassium Carbonate upon Isobutyl-aldehyde.—F. Urech places about 3 grms. pure isobutyl-aldehyde in a narrow test tube graduated in half millimetres. With a lens it is possible to read accurately quarter millimetres. After 3 decigrms. of finely-powdered recently-ignited potassium carbonate have been added, the tube is closed, set in a horizontal position, and the level is read off every five minutes for forty-eight hours. The liquid will be found to have sunk from 21.50 to 14.50 degrees.

At a meeting of the Société Industrielle of Mulhouse, it was stated that tin sulphocyanide, formed by the double decomposition of calcium sulphocyanide and tin oxalate, is found very useful in calico printing.

For printing cotton with the azo-colors, Dr. Allrich proposes to dissolve 100 grms. of the color in five times its weight of water; then to make up a solution of sodium stannate or aluminate at 15° B., to every litre of which are added 20 grms. alizarin oil. Of this mixture 150 grms. are incorporated with the color, which is then thickened with starch and printed. After printing the pieces are steeped for an hour in lead or barium acetate or barium chloride at 5° to 10° B., and washed in cold water.

CORRESPONDENCE.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.*]

To the Editor of "Science:"

In reference to the correction of one of my statements made in your issue of the 29th inst. by Dr. Burt G. Wilder, I would say that I accept the criticism in all its bearings. The view which Dr. Wilder expresses regarding the upper wall of the third ventricle being constituted by the *ependyma* stretched across between the *habenulæ* of the pineal gland, was once entertained by myself (in accordance with the orthodox view of embryologists since the time of Rathke), and was the one which Dr. Wilder may perhaps recollect I expressed to him in conversation last year. I return to that view again. My abandonment of it was due to the confounding of two distinct questions, *i. e.*, the question of the true inner boundary of the floor at the lateral ventricle and the true upper and outer boundary of the third. The view I should have credited to Wilder and Hadlich, is that the *lateral ventricle does not* extend over the thalamus. My misapprehension of Wilder's statement is based on the fact that it rested on a verbal communication. That I mentioned it at all was

[7] Am. Jour. of Science, July, 1863.

[8] "At this period, so many stars fell from heaven that they could not be counted. In France the inhabitants were amazed to see one o thenmsfi great size fall to the earth, and they poured water on the spot, we hish their exceeding astonishment smoke issued from the ground with aoot f-- ing noise."—Herrick's Catalogue. This record is of great interest as indr cating the fall of an aerolite during the shower of meteors.

[9] "A Soissons, on voit le ciel en feu. Une pluie de sang tombe sur Paris."