

the points of first and last appearance of some 13,000 meteors observed by Heis and the various colleagues who assisted him from time to time, followed by partial discussion of the results and catalogues of radiant points. A fuller account of this valuable publication must be reserved for a future note. The first number of this series contains Heis's long-continued observations on the zodiacal light.

A NEW COMET.—M. Coggia, of the Observatory at Marseilles, discovered a faint comet on September 14. Its position at 14h. 38m. 8s. mean time at Marseilles, was in R.A. 8h. 32m. 31s.; N.P.D., 41° 45' 59." Daily motion in R.A. - 45 seconds, in N.P.D. + 18 minutes. The comet has a central condensation, with trace of a tail.

CHEMICAL NOTES

ACTION OF ORGANIC SUBSTANCES INCREASING THE SENSITIVENESS OF CERTAIN SILVER SALTS.—Mr. M. C. Lea, of Philadelphia, has criticised, in a short paper, the theory brought forward by Poitevin and Vogel, that increased sensitiveness was imparted to the halogen compounds of silver by certain organic substances in virtue of their affinity for hydrogen. From experiments he has made he is led to the conclusion that these organic substances do not form substitution products as might be expected if they possessed an affinity for hydrogen, but that they all act as reducing agents. The natural view, therefore, of their action which Lea deduces is that the affinity of the organic substance for oxygen assists that of halogen for hydrogen, and, under the influence of light, a molecule of water becomes decomposed. That, in the case of tannin and silver iodide for instance, the tannin is oxidised, the iodine converted into hydriodic acid, and the silver salt more or less reduced. According to this theory traces of free acid would be found instead of the iodine substitution product. His experiments have confirmed this supposition, and he concludes, therefore, that the increase of sensitiveness produced by organic substances takes place in virtue of their affinity for oxygen promoting the decomposition of water by the halogen employed.

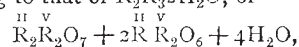
HEAT OF COMBUSTION OF OXYGEN AND HYDROGEN IN CLOSED VESSELS.—In a recent number of the *Journal* of the German Chemical Society there are some experiments on the above subject communicated by Than. He has modified Bunsen's ice calorimeter, so as to make it available for heat determinations in chemical action, and by this means he has obtained accurate results of the heat of combustion of electrolytic gases in closed vessels. The terms "heat of combustion," or "total difference of energy," are used by Than to express the quantity of actual energy evolved when the combining gas, in the case of oxygen and hydrogen at 0° and 760 mm., is completely converted in a closed vessel into water. Taking the atom of hydrogen as unity he finds that a gramme of hydrogen uniting with the requisite quantity of oxygen in a closed vessel to form water, produces 33982 units of heat, which number agrees closely with that found by Andrews, viz, 33,970.

ON VAPOUR VOLUMES IN RELATION TO AVOGADRO'S LAW.—In the same journal (*Ber. chem. Ges.*, x.) there is a paper by Troost, detailing experiments made to determine the accuracy of Avogadro's theory that "equal volumes of substances in the state of vapour contained the same number of molecules," i.e., that the volume of the molecule of hydrogen being called 2, the volume of all other molecules must also be 2; instead of as happens in certain cases, apparently 4, 6, or 8. The method of experiment adopted was to introduce into the vapour of chloral hydrate a salt containing water having a dissociation-tension nearly equal to that of chloral hydrate; if the chloral hydrate vapour undergoes dissociation, and consists of equal volumes of chloral and aqueous vapours, then the vapour volume will remain constant; but if chloral hydrate is volatile as such, its vapour will be free

from water, and on introducing the salt it will give up water, and the volume of vapour will increase till the dissociation-tension is reached. The salt used was potassium oxalate, containing one molecule of water. Troost has found that the volume increases on the addition of the oxalate, leading him therefore to the conclusion that chloral hydrate undergoes volatilisation without decomposition.

CHEMICAL CONSTITUTION OF THE MINERALS HATCHETOLITE AND SAMARSKITE, FROM NORTH CAROLINA.—Mr. O. D. Allen has lately had an opportunity of making some further experiments on the above minerals lately described by Mr. J. L. Smith, and of which a short note was given some time ago in NATURE. His analytical results confirm those of Mr. Smith, and from these he deduces a ratio among the elements closely

corresponding to that of $R_2R_3^v2H_2O$, or



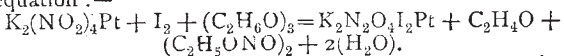
when R represents one atom of a bivalent radical, or two

of sodium, and R^v tantalum or columbium. The investigations of Rammelsberg point to the conclusion that three columbates (having columbium replaced by tantalum)

occur in minerals, viz., RCb_2O_6 , $R_2Cb_2O_7$, and $R_3Cb_2O_8$, which, singly or combined with each other, constitute mineral species. Mr. Allen regards hatchetolite as composed of the first two, with a small quantity of normal titanate. He also thinks that it may have resulted from the alteration of a mineral possessing essentially the same composition as pyrochlore, by hydration, and removal of alkaline fluorides. From his analysis of samarskite a ratio is obtained closely approximating to that required

by the formula $R_2R_2O_7 + R_3R_2O_8$. From this it would appear that samarskite closely resembles fergusonite in chemical constitution, the formula of that latter body, deduced by Rammelsberg, being $R_3(Cb, Ta)_2O_8$.

ON A NEW CLASS OF BODIES TERMED PLATOID-NITRITES.—Nilson has lately described in the *Ber. Berl. chem. Ges.* x., a series of bodies to which he has assigned the above name, and which he prepares by acting on potassium or barium platinonitrite with an alcoholic solution of iodine. Aldehyde is evolved on heating the mixture, which latter, originally brown, becomes of an amber colour. The platoidnitrite is deposited in crystals. He has prepared the potassium salt in four-sided amber prisms, and assigns to it the formula $K_2N_2O_4I_2Pt$ (H_2O)₂. He represents the reaction by the following equation:—



He describes also a new acid obtained by decomposing barium platinonitrite with sulphuric acid and evaporating in vacuo. The first product consisted of an acid corresponding to the platotetranitrosylic acid of Lang, but on evaporating the solution to dryness, after removal of the first crystals, a permanent residue of a brownish-green colour remained, which, after drying over sulphuric acid, gave on analysis the following composition: $H_4(NO_2)_8Pt_3O \cdot 2(H_2O)$. The author calls this triplato-octinitrosylic acid.

A NEW ACID.—At the last meeting of the Nieder-rheinische Gesellschaft für Natur und Heilkunde of Bonn Prof. Mohr announced the discovery of a new acid of phosphorus and oxygen, by Herr Th. Salzer, of Worms. The new acid stands between phosphorous acid and phosphoric acid, and consists, according to old notation, of one atom of phosphorus and four atoms of oxygen. It has been named hypophosphoric acid. It forms a rather insoluble soda salt. Herr Salzer found that the "acide phosphatique" described by Pelletier consists of a mixture of phosphorous and hypophosphoric acids.