

of 40 cm., and was so hot that the observer was unable to put his hand on it. At the explosion of the meteor several small portions weighing from 30-60 gr. were scattered, while the weight of the chief mass amounted to 22 kg. The description of the exterior says that it showed the general, smooth, black crust, while from the fracture it was noticed to be finely granulated; one could also see easily small particles of iron, which could without any difficulty be separated by pulverisation. Chemical analysis showed that nickel and cobalt was present in considerable quantities.

JAHRBUCH DER ASTRONOMIE UND GEOPHYSIK.—This volume, which is edited by Dr. Hermann J. Klein, contains a very interesting account and summary of the work done in various branches of astronomical science during the past year. Dunér's, Deslandres', Hale's, and Young's sun observations are referred to, while several other references to solar work are given. The numerous observations made with reference to the major and minor planets are here all brought together; Trouvelot's Venus observations, the opposition of Mars, and the recent discovery of Jupiter's fifth satellite being rather prominent. Under the heading of "The Moon" Wernik's enlargements, Böddiker's and Hartmann's researches and are referred to at some length. Comets, meteorites, and shooting stars also come in for a good share, and under the fixed stars, in which are included all variables, nebulae, &c., are included references to the Nova in Auriga, stellar spectroscopic observations, motion in line of sight, &c.

THE OBSERVATORY.—From the cover of the *Observatory* one quite misses the familiar name of Dr. Common, in place of which are now inserted Messrs. T. Lewis and H. P. Hollis. In an editorial notice Mr. Turner says a few words to account for this perturbation, mentioning that it is owing to pressure of work, which has made it impossible for either of them to conduct the magazine. He concludes by saying, "It would be with the keenest satisfaction that we should return to the management of the magazine if the future should have that in store for us."

GEOGRAPHICAL NOTES.

THE Scottish Geographical Magazine for April contains a paper of some value by Colonel Justin C. Ross on irrigation and agriculture in Egypt, giving the result of his experience as Director-General of Irrigation in that country. In consequence of the indisposition of Colonel Bailey the *Magazine* is now edited by Mr. W. A. Taylor, Librarian to the Royal Scottish Geographical Society, who has for several years had charge of the book reviews and geographical notes.

The April number of the *Deutsche Rundschau für Geographie* contains a coloured map of the density of population in Holland which illustrates in a manner very rare in continental map-work an ignorance of the first principles of map colouring. The objects of map colouring are two—one is to indicate the areas occupied by discontinuous and unlike conditions, such as countries, races of people, or geological formations. For this the colours have to be as strongly contrasted as possible and the map is necessarily and properly a patchwork. The other object is to show the distribution of a continuously varying quantity, like altitude, temperature, or rainfall, and in order to attain it the colours ought to merge one into the other so that the eye is carried from the lowest to the highest value by just perceptible gradations. The Austrian map referred to applies the first method to bring out the second result, each different density of population being coloured so as to contrast with the others, and to show no definite gradation from less to greater.

Globus states that the Russian Government, dissatisfied with the foreign sound of the names Dorpat and Düna, have resolved to rename those towns Jurjew and Dwinsk respectively.

The Paris Geographical Society held a special meeting in commemoration of the discoveries of Columbus on March 4, the four hundredth anniversary of his return from the first transatlantic voyage. A masterly address by M. Levasseur on the moral and material consequences of the discovery of America, and a paper by Dr. Hamy on the traces of Columbus in Spain and Italy were the principal features of the meeting.

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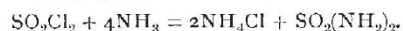
SOME recent measurements in Russia, noticed by M. Venukoff in the last number of the *Comptes Rendus* are valuable as leading to some conclusions regarding the form of the geoid. Determinations of the value of the degree of longitude along the parallels of $47^{\circ}30'$ and 52° accord closely with Bessel's geoid (polar flattening $\frac{1}{290}$) and are widely divergent from Clarke's result of $\frac{1}{230}$.

THE AMIDE AND IMIDE OF SULPHURIC ACID.

FURTHER details concerning these interesting substances are communicated by Dr. Traube of the laboratory of the Berlin University to the current number of the *Berichte*. It has long been surmised that an amide of sulphuric acid was capable of existence, and Regnault assumed that the product which he obtained by leading ammonia gas into a solution of sulphuryl dichloride in ethylene chloride consisted of that substance mixed with sal-ammoniac. Dr. Traube has further investigated the reaction and has at length isolated not only sulphuryl diamide, $\text{SO}_2(\text{NH}_2)_2$, but also sulphuryl imide, SO_2NH , the imide of sulphuric acid, and has, moreover, prepared several metallic derivatives of each.

Sulphuryl Diamide.

The most advantageous mode of preparing sulphuryl diamide consists in saturating a solution of sulphuryl dichloride, SO_2Cl_2 , in chloroform with ammonia. It is necessary to dilute the sulphuryl dichloride with 15-20 times its volume of chloroform, and to maintain a low temperature by extraneous cooling in order that the reaction may be under complete control, and the ammonia gas must be carefully dried before being allowed to bubble through the liquid. The main reaction occurs in accordance with the following equation:—



The products are gradually deposited in the form of a white solid, which, after the completion of the reaction, is agitated with water until the whole of it is dissolved. The ammoniacal aqueous solution is then separated from the chloroform, acidified with nitric acid, and the whole of the chlorine removed by the addition of silver nitrate. After removal of the silver chloride by filtration the acid solution is neutralised with alkali and silver nitrate again added, when a crystalline precipitate is obtained consisting of a silver derivative of sulphuryl diamide, $\text{SO}_2(\text{NHAg})_2$, together with another silver compound, whose composition has not yet been definitely ascertained. In order to isolate the silver compound of sulphuryl diamide, the washed precipitate is decomposed with the calculated quantity of hydrochloric acid, and the resulting acid liquid carefully neutralised with ammonia; upon now adding silver nitrate only the silver compound of unknown and complex composition is deposited. The pure silver compound of sulphuryl diamide is finally deposited upon adding a further quantity of silver nitrate and sufficient ammonia to render the liquid strongly alkaline.

When the precipitated silver compound of sulphuryl diamide is decomposed with hydrochloric acid a feebly acid liquid is obtained, which, when evaporated to a syrup *in vacuo*, at a temperature not exceeding 40° , and afterwards allowed to stand *in vacuo* over oil of vitriol, gradually deposits large colourless crystals of pure sulphuryl diamide, $\text{SO}_2(\text{NH}_2)_2$.

Sulphuryl diamide is an extremely deliquescent substance. The crystals are rapidly dissolved by water, but are practically insoluble in organic solvents. They soften at 75° and melt at 81° . As the liquid cools, however, it exhibits the property of superfusion to a very marked extent, remaining liquid many degrees below its melting-point. The moment, however, it is disturbed by contact with a sharp body, it instantly solidifies. When heated above its melting-point sulphuryl diamide loses ammonia even below 100° ; up to 250° no further decomposition than the loss of ammonia occurs, the residual compound being the sulphuryl imide to be presently described. Above 250° complete decomposition ensues with the evolution of acid fumes.

The aqueous solution of sulphuryl diamide reacts neutral to litmus and possesses a bitter taste. It yields no precipitates in acid solutions either with salts of barium or platinum chloride. On long boiling with acids, however, it is gradually converted into sulphuric acid and ammonia, and then yields the usual