

U Pegasi, Pickering concludes that the star exhibits a principal and secondary minimum, at magnitudes 9.90 and 9.75 respectively, in a period of nine hours. Chandler, however (*Astronomical Journal*, XVIII., p. 140), regards this difference between the minima too slight to be conclusive, and derives from his own observations (with the omission of his first estimates by which he discovered the star's variability) a simple, symmetrical light curve, with a period of four and one-half hours.

The number of variables in star clusters discovered by Bailey on the Harvard plates has been increased by his further study of them, so that now the clusters ω Centauri, Messier 3, Messier 5 and N. G. C. 7078 have been found to contain, respectively, 122, 132, 85 and 51 variable stars, or 390 in all.

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NOTES ON INORGANIC CHEMISTRY.

SOME weeks since attention was called in these notes to the formation of ammonium peroxid, or rather a compound of ammonium peroxid and hydrogen peroxid, by P. Melikoff and L. Pissarjewsky at the University of Odessa. To this compound, which is formed by the action of ethereal solution of ammonia upon a similar solution of hydrogen peroxid, the formula $(\text{NH}_4)_2\text{O}_2, 2\text{H}_2\text{O}_2, 10\text{H}_2\text{O}$ was given. An article in the last *Berichte* gives further particulars of the compound and assigns the formula $(\text{NH}_4)_2\text{O}_2, \text{H}_2\text{O}_2, \text{H}_2\text{O}$. The water is considered as water of crystallization, and is apparently not constant, as in one specimen the water present corresponded to $(\text{NH}_4)_2\text{O}_2, \text{H}_2\text{O}_2, \frac{1}{2}\text{H}_2\text{O}$. It is possible, however, to consider the substance as $\text{NH}_4\text{O}_2\text{H}$, the peroxid of ammonium hydroxid. From the relative stability of ozone and hydrogen peroxid it is not improbable that their constitutional formulæ should be written $\text{O}=\text{O}^{\text{iv}}=\text{O}$ and $\begin{smallmatrix} \text{H} \\ \text{H} \end{smallmatrix} > \text{O}^{\text{iv}}=\text{O}$, one atom of

oxygen being considered quadrivalent. If this be the case, the formula of ammonium peroxid might be $\begin{smallmatrix} \text{NH}_4 \\ \text{H} \end{smallmatrix} > \text{O}^{\text{iv}}=\text{O}$.

IN the same *Berichte* account is given of some new compounds in which a part of the oxygen in sulfates and phosphates is replaced by fluorin. Types of these compounds are $\text{HK}_3\text{S}_2\text{O}_7\text{F}$, H_2O and HRbPO_3F , H_2O . These interesting substances are fairly stable and are closely related to the fluoriodates, not long since discovered by Professor Weinland, to whom we are also indebted for these fluosulfates and fluorphosphates.

At the last meeting of the Chemical Society (London) a paper was read by W. A. Shenstone and Beck, on the influence of the silent discharge of electricity on atmospheric air. At first there is a large contraction and this is followed by a re-expansion to nearly the original volume, and a trace of nitrogen peroxid is present.

The explanation offered is that at first the oxygen in the air is condensed to ozone. In air it appears that owing to dilution with an inert gas, nitrogen, from 80 % to 90 % of the oxygen can be converted into ozone. This causes the first contraction. When the oxygen is almost completely changed into ozone some small amount of nitrogen dioxid is formed. This at once attacks the ozone molecule and breaks it down under the influence of the silent discharge, and the gas returns to its original volume. As confirmatory of this theory is the fact that not a trace of ozone can be made in the presence of nitrogen peroxid.

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SCIENTIFIC NOTES AND NEWS.

THE ALLEGHENY OBSERVATORY.

PROFESSOR JAMES E. KEELER has written a letter to the Chairman of the Observatory Committee stating that he is prepared to decline the call to the Directorship of the Lick Obser-