

much accentuated, due to the motion as well as the lateral displacement, slipping, or spreading of the wedge-barriers.

On the day of the *Condor* disaster the temperature contrast between the valley and the Bay air masses at the surface at 8 h. was of the order of 8° or 9° C. and their depth between 1 km. and 2 km. At and above 2 km. level there was a westerly or north-westerly circulation, wind speed increasing with height, which often carries with it super-adiabatic lapse rates favourable to accelerated updraughts (*vide* Roy and Chatterji, NATURE, Sept. 28, 1929, p. 481). Inversions in the lower layers of the atmosphere over Bengal usually retard updraught of moist air until noon, but this factor often disappears in the afternoon.

The above facts suggest that nor'wester thunderstorms can occasionally develop into tornadoes if additional favourable conditions can combine suitably.

It appears from preliminary studies that the mechanism of the Bay of Bengal storms is similar to that of the tornado described above. The subject is under investigation.

S. N. SEN.

The Observatory,
Alipore, Calcutta,
Oct. 22.

The Latent Photographic Image.

IN a recent letter to NATURE (Nov. 15, 1930) A. P. H. Trivelli replies to our criticism (*Proc. Roy. Soc., A*, 127, 613; 1930) of his "elementary voltaic cell" theory of latent image formation, originally put forward by him in 1927 (*J. Franklin Inst.*, vol. 204, 649), and concludes that our criticism is not justified. It seems from his letter that he has not realised the significance of our experimental results as they affect his theory. We agree with him, of course, that the larger the silver nucleus originally present in the grain, the less is the amount of silver which must be added during the exposure in order that a development centre may be produced, and hence the greater the sensitivity of the grain. But quite independently of the absolute mass of silver which (according to Trivelli's theory) must be deposited *electrolytically* during the exposure, his theory demands that the electrolytic current in the light shall be enormously great *relative to its value in the dark*. We say this is extremely improbable, mainly because our experiments show that illumination causes little, if any, increase in the electrolytic conductivity of silver bromide.

Our second criticism of Trivelli's theory is based on the fact that the electrolytic current in silver bromide falls exponentially with decreasing temperature, being 10^5 times less at the temperature of boiling liquid oxygen than at room temperatures. On the other hand, photographic sensitivity at the former temperature is still a large fraction of its value at room temperature. Trivelli says, "This objection again ignores the effect of the size of the pre-existing speck. Only if sensitivity specks were totally absent would the temperature coefficient of photographic sensitivity be comparable with that of electrolytic photoconductance." We cannot agree with this. Since the mass of silver deposited in a given time by an electrolytic current depends on the magnitude of the current, a large decrease in current (by lowering the temperature) must necessarily produce a corresponding decrease in the *rate* at which silver is deposited. This is a fact which is quite independent of the number of silver atoms which must be added to the original silver nucleus to make a development centre, and which is, therefore, unaffected by the size of the sensitising nucleus. Therefore, on Trivelli's theory, the temperature coefficient of photographic sensitivity should, to

some extent, be comparable with that of electrolytic conductance.

On both these grounds it still seems to us that Trivelli's theory is quite incompatible with our experimental results.

F. C. TOY.

G. B. HARRISON.

The Shirley Institute,
Didsbury, Manchester.
Dec. 12.

Structure of Hydrogen Sulphide and Hydrogen Selenide.

IN NATURE of Dec. 13, p. 916, Prof. L. Vegard communicates the results of the investigation of crystalline structure of hydrogen sulphide and selenide, which were made by him in the Physical Institute of Oslo and finished in July last, while his letter is dated Nov. 6.

I may be permitted to recall that I have already published two papers on the structure of these substances. These papers were presented to the R. Accademia dei Lincei in Rome at the meetings of Mar. 2 and April 6, 1930, and published in Fasc. 7 and 8 of vol. 11, 1st sem., pp. 679-684, 749-754. Abstracts appeared in NATURE of Sept. 6, p. 387, and Sept. 27, p. 495.

The data generally agree with those given by Vegard, as for both substances we found a cubic lattice, with face-centred distribution for sulphur and selenium atoms. For the side of the cell (a) and density of hydrogen sulphide our values are also very similar: $a = 5.778$ A. (N.), 5.76 A. (V.); density = 1.166 (N.), 1.17 (V.). For hydrogen selenide there is a certain quantitative difference: $a = 6.020$ A. (N.), 6.10 A. (V.); density = 3.45 (N.), 2.34 (V.), as to the cause of which I cannot for the moment decide, and which I shall investigate further.

For the distribution of the hydrogen atoms and the structure of the whole lattice, Vegard considers as most probable space groups T^4 or T_2^6 . Considering both substances as ionic compounds, I regard as most probable the space group Oh^3 , that is, a fluorite type, which is shown also by lithium sulphide (Claassen, *Rec. Trav. Chim. Pays Bas*, 44, p. 790; 1925).

G. NATTA.

Laboratorio di Chimica Generale,
R. Politecnico, Milan,
Dec. 27.

Viscosity of Electrolytes.

IN NATURE of Dec. 27, p. 994, there are some general statements as to the viscosity of electrolytes, which are by no means universally true. I refer to the statements that "the relative viscosity of all electrolytes must be greater than unity at high dilutions"; and that the phenomenon of 'negative viscosity' will disappear. In a paper on the viscosity of aqueous solutions (*Trans. Chem. Soc.*, vol. 107, p. 1789; 1915) the example of nitric acid is given and the relative principles are discussed. It appears that the viscosities depend upon the mutual depolymerisation of the electrolyte and the solvent, and that the resultant behaviour depends on the temperature.

At low temperatures, where a large proportion of trihydrol is present, the addition of the electrolyte breaks up so many of the ice molecules that even at high dilution the viscosity of the solution is reduced below that of water. The subject is treated at length in the paper to which I have referred.

W. R. BOUSFIELD.

St. Swithins, Northwood,
Middlesex, Dec. 31.