

DESCRIPTION OF PLATE 1.

- Fig. 1. Effect of pyrogallic acid solution upon the red blood-corpuscles of the newt.  
,, 2. Effect of gallic acid.  
,, 3. Effect of hydrochloric acid.  
,, 4. Effect of oxalic acid.  
,, 5. Effect of carbolic acid.  
,, 6. Various forms assumed by the corpuscles when acted upon by ammonium sulphocyanide or potassic sulphocyanide.  
,, 7. Various forms produced by the action of ammonium chromate.  
,, 8. Shows final effect of ammonium sulphocyanide on the nucleus, viz., to reveal an intranuclear plexus.

*April 5, 1883.*

THE PRESIDENT in the Chair.

The Presents received were laid on the table, and thanks ordered for them.

The following Papers were read :—

- I. “On a hitherto unobserved Resemblance between Carbonic Acid and Bisulphide of Carbon.” By JOHN TYNDALL, F.R.S. Received March 15, 1883.

Chemists are ever on the alert to notice analogies and resemblances in the atomic structure of different bodies. They long ago indicated points of resemblance between bisulphide of carbon and carbonic acid. In the case of the latter we have one atom of carbon united to two of oxygen, in the case of the former one atom of carbon united to two of sulphur. Attempts have been made to push the analogy still further by the discovery of a compound of carbon and sulphur analogous to carbonic oxide, but hitherto, I believe, without success. I have now to note a resemblance of some interest to the physicist, and of a more subtle character than any hitherto observed.

When, by means of an electric current, a metal is volatilized and subjected to spectrum analysis, the “reversal” of the bright band of the incandescent vapour is commonly observed. This is known to be due to the absorption of the rays emitted by the hot vapour in the partially cooled envelope of its own substance which surrounds it. The effect is the same in kind as the absorption by cold carbonic acid of the heat emitted by a carbonic oxide flame. For most sources of

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radiation carbonic acid is one of the most transparent of gases; for the radiation from the hot carbonic acid produced in the carbonic oxide flame, it is the most opaque of all.

Again, for all ordinary sources of radiant heat, bisulphide of carbon, both in the liquid and vaporous form, is one of the most diathermanous bodies known. I thought it worth while to try whether a body reputed to be analogous to carbonic acid, and, like it, so pervious to most kinds of heat, would show any change of deportment when presented to the radiation from hot carbonic acid. Does the analogy between the two substances extend to the vibrating periods of their atoms? If it does, then the bisulphide, like the carbonic acid, will abandon its usually transparent character, and play the part of an opaque body, when presented to the radiation from the carbonic oxide flame. This proves to be the case. Of the radiation from hydrogen, a thin layer of bisulphide transmits 90 per cent., absorbing only 10. For the radiation from carbonic acid, the same layer of bisulphide transmits only 25 per cent., 75 per cent. being absorbed. For this source of rays, indeed, the bisulphide transcends, as an absorbent, many substances which, for all other sources, far transcend *it*.\*

II. "On Electrical Motions in a Spherical Conductor." By HORACE LAMB, M.A., formerly Fellow of Trinity College, Cambridge, Professor of Mathematics in the University of Adelaide. Communicated by J. W. L. GLAISHER, M.A., F.R.S. Received March 14, 1883.

(Abstract.)

This paper treats of the motions of electricity produced in a spherical conductor by any electric or magnetic operations outside it. The investigation was undertaken some time ago in illustration of Maxwell's theory of electricity. This theory is so remarkable, more especially in the part which it assigns to dielectric media in the propagation of electro-magnetic effects, that it seemed worth while to attack some problem in which all the details of the electrical processes could be submitted to calculation, although it was evident

\* Nearly twenty years ago I observed, among other changes of diathermic position, the reversal of bisulphide of carbon and chloroform, when the pale blue flame of a Bunsen burner was the source of heat. When, for example, the rays issued from a luminous jet of gas, the absorptions of the bisulphide and of chloroform were found to be 9·8 and 12 per cent. respectively; whereas when the Bunsen flame was employed, the absorptions of the same two substances were 11·1 and 6·2 per cent. The cause of this reversal doubtless is that in the Bunsen flame hot carbonic acid is the principal radiant. ("Phil. Trans.," 1864, p. 352.)—April 6.