PROCEEDINGS
OF THE
ROYAL SOCIETY OF EDINBURGH.

1838–9.

No. 15.

Monday, 21st January 1839.

Lord GREENOCK, V. P., in the Chair.

The following Donations were presented :—

The Natural History of the Fishes of the Firth of Forth and Tributaries. By Richard Parnell, M. D., F. R. S. E.—*By the Author.*

The Laws of Harmonious Colouring, adapted to Interior Decorations, Manufactures, and other useful purposes. By R. D. Hay, House Painter.—*By the Author.*

The Silurian System, founded on Geological Researches in the Counties of Salop, Hereford, Radnor, Montgomery, Caermarthen, Brecon, Pembroke, Monmouth, Gloucester, Worcester, and Stafford; with Descriptions of the Coal-Fields and Overlying Formations; with a large separate Map. By Frederick Impey Murchison, F. R. S., F. L. S.—*By the Author.*

Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences (1838, 2nd Semestre). Nos. 26, 27.—*By the Academy.*

Flora Batava, No. 116.—*By the King of Holland.*

The following communications were read :—

1. On the Colour of Steam under certain circumstances. By Professor Forbes.

The author accidentally remarked, that the colour of the Sun seen through vapour issuing from the safety-valve of a locomotive engine is deep red, exactly similar to that which a column of smoke or a smoked glass gives to it.

He next noticed that this colorific character of steam extended but a short way beyond the orifice, and that it gradually became more opaque, and perfectly white like noon-day clouds, both for transmitted and reflected light. At moderate thicknesses, in this state, its opacity is complete.

These observations were fully confirmed by direct experiments on high-pressure steam, made at Glasgow in December last. At the moment of issuing from the steam-cock, it is perfectly transparent and colourless; at some distance from the orifice it becomes transparent and orange-red; but, still farther off, it is white, and merely translucent. These properties were traced in steam from a pressure above that of the atmosphere of 55 lb., down to an excess of only three or four; and as in all cases the redness of the transmitted light was more or less distinctly seen, (and an excess of 10 or 15 lb. does as well as any higher pressure), it was concluded that the effect of partial condensation in producing the phenomenon, would be rendered visible in great thicknesses of vapour of the lowest tension.

The great analogy of the colour of steam to that which the clouds assume at sunset, or distant lights in certain conditions of the atmosphere, lead the author to suggest this singular property of condensing vapour as the probable cause of those phenomena, of which no satisfactory explanation could be given whilst this fact remained unknown. The prognostics of weather derived from the colours of the sky also receive elucidation from the fact.

Judging from the similarity of colour of steam and that of nitrous acid gas, and the remarkable power of absorbing certain definite rays of the spectrum discovered in that gas by Sir David Brewster, the author thought it probable that similar lines might be discovered in the spectrum formed by light transmitted through steam, and that these might be found to coincide with the *atmospheric lines* of the spectrum noticed by the same philosopher. The experiment was made with great care, but the expected result has

not been hitherto obtained. The general action of steam on the spectrum is to absorb the violet, blue, and yellow rays, finally leaving only the red and orange, with an imperfect green.

Since a portion of watery vapour in a confined space, originally transparent and colourless, may become, by mere change of temperature, first deep orange-red and transparent, and finally white and semiopaque, the author notices another analogy with the singular effect of temperature in deepening the colour of nitrous acid gas, and thinks that these facts may one day throw some farther light on the difficult subject of the mechanical constitution of vapours, and particularly of clouds.

2. On the meaning of the Homeric terms *θεμισ*, *δικη*, *τιμη*, *ποινη*, with their more important compounds and derivatives.
By the Venerable Archdeacon Williams.

Monday, 4th February.

Dr ABERCROMBIE, V. P., in the Chair.

The following Donations were presented :—

Tijdschrift voor Natuurlijke Geschiedenis en Physiologie. Uitgegeven door J. Van Der Hoeven, M. D., en W. H. De Vriese, M. D.—*By the Editors.*

First and Second Annual Reports, Laws, and Transactions of the Royal Botanical Society of Edinburgh.—*By the Society.*

Address of His Royal Highness the Duke of Sussex, K. G., &c. &c. President of the Royal Society, read at the Anniversary Meeting on Friday the 30th November 1838.—*By the Society.*

Proceedings of the Geological Society of London, 1838. No. 59.—*By the Society.*

Journal of the Statistical Society of London for January 1839.—*By the Society.*

Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences, 1839. 1^{er} Semestre. Nos. 1, 2.—*By the Academy.*

Natuur-en-Scheikundig Archief, uitgegeven door G. J. Mulder en W. Wenkebach. 1837. St. 4.—*By the Editors.*

The following communication was read :—

The Colours of the Atmosphere considered with reference to a paper “ On the Colour of Steam under certain cir-