

spectrum is observed to be crossed throughout its whole extent with alternate dark and coloured bands, increasing in number and diminishing in magnitude with the thickness of its plate. In the phenomena of periodical colours there are three peculiarities demanding notice; first, that the dark lines change their places by varying the inclination of the plate; secondly, that two or more lines never coalesce into one; and thirdly, that the colour of the luminous bands in the complementary spectrum are the same as those of the original spectrum when the thin plate is perfectly colourless. The author institutes a comparison of these phenomena with those of absorption as exhibited by a solid, a fluid, and a gaseous body; employing as an example of the first, smalt blue glass; of the second, the green sap of vegetables; and of the third, nitrous acid gas. No connecting link between these phenomena appeared to exist, excepting that both exhibited a divided or mutilated spectrum; but even this common fact has not the same character in both. The nacreous substance described by Mr. Horner, however, in some cases, when the plates were small, was found to produce bands perfectly identical with those of thin plates; while in other cases the bands were exactly similar to those of coloured media. By employing the iridescent films of decomposed glass, the author obtained combinations of films which gave, by transmitted light, the most rich and splendid colours, surpassing every thing he had previously seen among the colours either of nature or of art. These facts have proved that the transmitted colours, though wholly unlike those of thin plates, are yet produced by the same causes, and are residuary, and generally complementary to the sum of the reflected tints. Thus the author has succeeded in completely identifying in their primary features the two classes of facts; the one resulting from absorption, the other from periodic action. The minor points of difference, namely, the uniformity of the bands and tints of absorbing media at all incidences, and the non-appearance of the reflected tints in such media, are endeavoured to be explained by the introduction of several considerations, the complete discussion of which the author reserves for the subject of a future paper. From the phenomena of thin plates, of polarized tints, and of absorption, the existence of a new property of light is deduced, in virtue of which the reflecting force selects out of differently coloured rays of the same refrangibility rays of a particular colour, allowing the others to pass into the transmitted ray; a principle not provided for in either of the theories of light to which the phenomena of absorption are ultimately referable, and furnishing an explanation of certain remarkable phenomena of dichroism in doubly refracting bodies, in which rays of the same refrangibility, but of different colours, pass into the ordinary and extraordinary pencils.

A paper was read "On the hereditary instinctive propensities of Animals." By Thomas Andrew Knight, Esq., F.R.S.

The author adduces, in support of the principle he had advanced in his paper on the economy of bees, namely, that instinctive propensities to the performance of certain actions are transmitted, inde-

pendently of education, from the parent to its offspring, several facts which have fallen under his observation in the course of various experiments commenced by him nearly sixty years ago and continued to the present time. He relates that a young terrier, whose parents had been trained to destroy pole-cats, and a young springing spaniel, whose ancestors through many generations had been employed in finding woodcocks, were reared together as companions; and that each of them, immediately on seeing, and for the first time in its life, the particular prey to which it was guided by hereditary instinct, pursued it with intense eagerness, while it did not appear to notice that which attracted its companion. In several instances he found that young springing spaniels, wholly inexperienced, were very nearly as expert in finding woodcocks as their well-trained parents. The habits of the woodcock have in the course of the last sixty years undergone considerable change, the fear of man having during that period become much stronger by transmission through many successive generations. The author believes that by continued education these hereditary propensities might be suppressed and others substituted: thus the habits of the springing spaniel would never have been acquired, if shooting on the wing had not been practised by man. A young dog, of the variety usually called *retrievers*, on account of their being trained to find and recover wounded game, performed this office, although wholly untaught, quite as well as the best-instructed dog. The male and the female parents appear to possess similar powers of transmitting to their offspring these hereditary feelings and propensities; excepting in the case of hybrid progeny, in which the author thinks he has witnessed a decided prevalence of the character of the male parent. With regard to dogs, the influence of one or other of the parents, and sometimes of both, may occasionally be traced, but without any constancy as to the particular predominance of either sex.

A paper was read "On Meteorological deductions from Observations made at the Observatory at Port Louis in the Mauritius, during the years 1833, 1834, and 1835." By John Augustus Lloyd, Esq., Surveyor-General of that Island, F.R.S. Communicated by Captain Beaufort, R.N., Hydrographer to the Admiralty, F.R.S.

The observations, from which the results recorded in the present paper were made, are nearly 50,000 in number, and were taken four times each day, at the hours of 8 A.M. noon, 4 and 8 P.M. The details of the observations themselves are about to be forwarded to the Royal Society; they relate to the states of the barometer, thermometer, hygrometer, rain gauge, and the appearance of the atmosphere with regard to clearness or cloudiness.

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June 1, 1837.

FRANCIS BAILY, Esq., V.P. and Treasurer, in the Chair.

William Ayrton, Esq., James Carson, M.D., William Hopkins, Esq., M.A., and Captain John Thomas Smith, were severally elected Fellows of the Society.