

operator's finger he would be able to feel the pull of the earth's magnetic force upon it. The work done by a few light touches of the finger must be amply sufficient to furnish all the energy required to deflect the needle. But to a modern electrician it certainly seems a remarkably efficient transformation.

GEORGE J. BURCH.

An Introduction to the Study of Colour Phenomena.
By Joseph W. Lovibond. Pp. 48; 10 coloured plates. (London: E. and F. N. Spon, Ltd.; New York: Spon and Chamberlain, 1905.) Price 5s. net.

THE author states that his object has been to supply the long-felt want of a power of recovering a given colour sensation and of a colour nomenclature by which that sensation may be quantitatively described. To this end "scales of red, yellow and blue were constructed of glass slips, the slips of each scale being all of one colour with a regular variation in intensity from 0.01 to 20 units, equal units of the three scales being in colour equivalence with each other. . . . The test of equivalence is that a white light viewed through equal units of the three scales should give no evidence of colour. . . . The fogs on Salisbury Plain furnished the light actually used." It was found that red, yellow, and blue were the only colours suitable for systematic work, and that any colour could be produced by their combination. The dimensions of the unit are, it is said, necessarily arbitrary, but the scale-divisions are equal, while the unit itself is recoverable.

The colour to be tested is matched by that or the light transmitted by one of the glasses, or by several superposed, equality of luminosity being secured, when necessary, by the interposition of a neutral-tinted combination between the eye and the coloured object. A specification of the glasses employed is registered, according to certain rules, as a formula which defines in terms of the author's constants the colour "developed," and supplies data for its future reproduction.

To those who are accustomed to regard the spectrum as the natural basis of colour experiment the author's method cannot but appear crude and unscientific; but, given a sufficient supply of carefully selected glasses, it is probable that much useful work might be done in a rough and ready way by its means. An example occurs in the quantitative study of the colour of the human blood in health and in disease, which is illustrated in plate vi.

The book concludes with an exposition of Mr. Lovibond's new theory of colour.

Index Phytochemicus. By Drs. J. C. Ritsema and J. Sack. With introduction by Dr. M. Greshoff. Pp. 86. (Amsterdam: J. H. de Bussy.)

DR. GRESHOFF explains in the introduction to this volume that it originated in a card index to the literature of plant chemistry compiled for use in the laboratory of the Colonial Museum at Haarlem, where the work carried on consists principally of the investigation of the proximate constituents of plants.

The index enumerates the names of more than two thousand plant constituents, and gives in each case the percentage composition, formula, melting or boiling point, and at least one reference to the literature—usually Beilstein's "Handbuch," though in a few cases the references are to original papers. The volume also contains a short but useful bibliography of plant chemistry.

The information given in the tables, so far as can be judged from trials in a few cases, appears to be accurate, and the index should prove useful to chemists engaged in the investigation of plant products.

LETTERS TO THE EDITOR.

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Eclipse Predictions.

IT is always interesting to compare the results of observation with those predicted by calculation. In the case of the recent total eclipse of the sun this is rendered difficult by the want of agreement in the predictions of the two most used authorities, the Nautical Almanac and the *Connaissance des Temps*. The discrepancies in the predicted duration of totality and of the breadth of the band traced on the earth's surface by the total phase are made apparent in the following table. It is compiled from the table in the Nautical Almanac headed "Limits of total phase of the Solar Eclipse," and the corresponding table in the *Connaissance des Temps* entitled "Limites de l'Éclipse totale et Durée de la Phase totale sur la Ligne centrale." Entries for as nearly as possible the same time in each table have been taken and are placed together:—

Column A contains the authority, Nautical Almanac (N.A.) or *Connaissance des Temps* (C.T.).

Column B contains the time (G.M.T.) for which each prediction is made.

Column C contains the calculated distance (in nautical miles) and the bearing of the northern limit of totality from the corresponding southern limit.

Column D contains the durations of totality on the central line as predicted by the one authority and (in brackets) as interpolated from the prediction of the other.

Column E contains the differences of these pairs of values.

A	B	C	D	E
1905 Aug. 30	Distance	Bearing	N.A.	C.T.
G.M.T.			secs.	secs.
h. m.				
C.T. 0 22 ... 113'5 ... N. 1° W. ... (198'4) ... 206 ... 7'4				
N.A. 0 24 ... 101'5 ... ,, 2 W. ... 200'6 ... (208) ... 7'6				
C.T. 0 35'2 ... 109'5 ... ,, 2 E. ... (211) ... 219 ... 8'0				
N.A. 0 36 ... 102 ... ,, 11 ,, ... 211'8 ... (219'5) ... 7'7				
C.T. 0 50'3 .. 114 ... ,, 6 ,, ... (220'2) ... 228 ... 7'8				
N.A. 0 48 ... 104 ... ,, 19 ,, ... 219'1 ... (227'4) ... 8'3				
C.T. 1 7'0 ... 116'5 ... ,, 10 ,, ... (223'8) ... 231 ... 7'2				
N.A. 1 8'0 ... 104 ... ,, 31 ,, ... 223'8 ... (231'2) ... 7'4				
N.A. 1 24 ... 105'5 ... ,, 37 ,, ... 22'7 ... (226'6) ... 5'9				
C.T. 1 24'9 ... 116'5 ... ,, 12 ,, ... (220'2) ... 227 ... 6'8				
C.T. 1 43'1 ... 115 ... ,, 14 ,, ... (209'2) ... 215 ... 5'8				
N.A. 1 44 ... 106 ... ,, 44 ,, ... 208'4 ... (214) ... 5'6				

It will be seen that, for stations in Spain and the adjacent Mediterranean, the duration of totality on the central line was predicted by the French authority to be from seven to eight seconds longer than by the British authority. In the same region, the width of the band of totality is from ten to eleven nautical miles greater by the French than by the British prediction. The orientation of the line connecting the two limits of totality also differs considerably in the two tables.

It is reported that at Sousse and Gabes, two towns in Tunisia, the eclipse was partial, while a total eclipse had been predicted for them. The prediction for these places would surely rest on French authority: we are therefore entitled to conclude that the mistake has been made by the French calculators. An excessive estimate of the width of the band of totality would almost certainly be accompanied by an excessive estimate of the duration of totality, and the table shows that both estimates are considerably greater in the *Connaissance des Temps* than in the Nautical Almanac.

J. Y. BUCHANAN.

October 13.

Absence of Vibration in a Turbine Steamship.

RETURNING homeward to Paris the middle of September from the Tripoli eclipse, and finding passage to America difficult to obtain, I chanced to learn that the triple-screw turbine steamer R.M.S. *Virginian* was sailing from Liverpool for Montreal on September 30, so I was very glad to have the opportunity of a voyage in a ship full powered with this novel type of propulsion. After a week on board I have no hesitation in saying that for freedom from