

whole face of this department of entomological science has undergone a wonderful change in the last twenty years.

Under these circumstances many an entomologist has no doubt often wished that a new "Genera of Diurnal Lepidoptera" would make its appearance; but such works are not to be lightly undertaken, and it may be long before we can hope to see a good, general, systematic treatise upon this group of insects. In the meanwhile we welcome Mr. Kirby's catalogue as a most important aid to the study of the Diurnal Lepidoptera. It is a complete catalogue of the described species of the group, amounting, as an estimate, to about 9,600 in number, and gives the synonyms both of the genera and species in a clear and easily-intelligible form. With the assistance thus offered to him by Mr. Kirby, the entomologist may easily ascertain what has been done by former writers in this department of his science, and it will be his own fault if he does not keep himself *au courant* with its future progress.

Criticism upon a work of this nature would be out of place here, and we can only cordially recommend the results of Mr. Kirby's most conscientious labours to the attention of all entomologists.

*A Class-book of Inorganic Chemistry, with Tables of Chemical Analysis, and Directions for their Use.* By D. Morris. B.A. (London: G. Phillip and Son, pp. 157.)

THIS work has been compiled for the use of students preparing for the Oxford and Cambridge Middle Class Examinations, and the Matriculation Examination of the University of London; it lays claim to no originality of treatment, and professes to be simply a collection of "enlarged notes." . . . "originally culled from the best modern books." Under these circumstances we are somewhat surprised that the author should have ventured to publish it; we are quite unable to detect any special merit in the book, and it is disfigured by many passages which show great want of exactness. Thus, we find "nitric acid, or nitric anhydride,  $N_2O_5$ ;" "sulphate of potassium or dipotassic sulphate;" the formula of phosphate of calcium is written  $3Ca_2PO_4$ , of chloride of lime  $CaOCl_2O$ . We are told that "ammonium and sodium are distinguished by the smell of ammonia on the addition of caustic potash." "Pure water has no action upon the metal (lead), but water charged with air corrodes it, and the oxide of lead thus formed dissolves in the water." Among the redeeming qualities of the book may be mentioned the questions which are selected from various University examination papers, and the examples given worked out in the text; but with errors of the nature of those given above it is impossible to recommend the book to the student, or to regard it as a reliable source of information.

*The Elements of Plane Geometry for the Use of Schools and Colleges.* By Richard P. Wright, Teacher of Mathematics in University College School, London, formerly of Queenwood College, Hampshire. With a Preface by T. Archer Hirst, F.R.S., &c., late Professor of Mathematics in University College, London. Second Edition. (Longmans, 1871.)

THIS work would have been more correctly described as being "by Eugène Rouché and Ch. de Comberousse, translated and edited by Richard P. Wright," &c. But although Mr. Wright can lay small claim to originality, he has shown judgment in the selection of an eminently logical and masterly treatise on geometry, and he has rendered it into clear and forcible English. The arrangement is excellent, and many of the conclusions for which Euclid found it necessary to reason geometrically on each particular case are treated generally by purely logical considerations. Many of the demonstrations, notably that of the *pons asinorum*, are far more simple and con-

vincing than those in Euclid. The difficulty of the twelfth axiom is met by the easy axiom that *through a point without a line only one parallel can be drawn to that line*. In some points there seems to be an unnecessary alteration of the language of Euclid, as in the definition of a figure, "Surfaces and Lines or combinations of them." This definition seems to have been introduced to enable the authors to describe a *locus* as a figure; but it having been pointed out that a locus is not a figure, Mr. Wright has described it as a *line*, but has not restored the word figure to its ordinary acceptation. At the same time it is not quite correct to define a locus as a *line*, excluding such loci as a pair of parallel lines, the circumference of a circle with its centre, &c. Again, the word *circumference* is substituted for the word *circle* whenever the circumference only is intended. It is true that the word *circle* in Euclid is used in two different senses, but this leads to no ambiguity of ideas; while the use of the word *circumference* for the circumference of a circle only excludes its application to an ellipse or other closed curve. The word *angle* is not defined when first introduced, but we are told afterwards that it "may be regarded as the quantity of turning of a definite character around the vertex, which a movable line must receive in passing from the direction of one side to that of the other." We fail to see the force of the words "of a definite character," and would suggest the following definition: "When a straight line moves about a fixed point in itself so as to occupy a new position, the quantity of turning it has undergone is called the angle between the two positions." The exercises are ingenious and instructive, but those of the earlier chapters are much too difficult for mere beginners. The treatment of proportion is good, and the work as a whole is an admirable introduction to the higher mathematics, and a great help to independent investigation. We especially recommend it to students who have found themselves discouraged by the cumbrous form and initial difficulties of Euclid. The second edition contains the alterations suggested by a late eminent mathematician in the *Athenæum* on the appearance of the first edition, with the addition of the substance of the second book of Euclid, and in a few cases the demonstrations of Euclid have been restored.

H. A. N.

#### LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.]

The Aurora Borealis of Feb. 4th

AFTER a rather long absence of auroral displays, a brilliant and many coloured example was seen here last night, February 4, not quite so vivid as that of October 1870, but coming next to it so far as my own experience goes.

At about 8 P.M., when the maximum development was reached, all the heavens were more or less covered with pink ascending streamers, except towards the north, which was characteristically dark and grey, first by means of a long low arch of blackness transparent to large stars, and then by the streamers which shot up from that and along its whole length, for they were green or grey only for several degrees of their height, and only became pink as they neared the zenith, the region where the more precise phenomena occurred, as thus:—

1. The focus of the vertical streamers coming up from all azimuths was very constant among the stars, but was not in the zenith itself, being nearly  $18^\circ$  south and  $5^\circ$  east thereof.

2. The red streamers varied from orange to rose-pink, red-rose, and damask-rose, or from strontium  $\alpha$ , through calcium  $\alpha$ , lithium  $\alpha$ , and on to and beyond potassium  $\alpha$ , that is, they did so to the naked eye, but the spectroscope knew no variety of reds amongst them; and I, having a very good referring spectrum in the lower part of the field of view, giving potassium  $\alpha$ , lithium  $\alpha$ , sodium  $\alpha$ , citron acetylene and green acetylene, be-