for safety; and, lastly, as to the financial return and the disposal of profits when such exist.

The second portion of the book is more directly concerned with light railway development in England. A useful chapter is concerned with an analysis of the Act of 1896, while the special chapters on "The Question of Gauge" and on "The Construction and Working of Light Railways" are perhaps the most valuable in the book. On the question of gauge it may be worth while to quote Mr. Cole's conclusion, which is that for railways making connection with main lines the standard gauge is imperative, and that for smaller independent lines the reduced gauge of thirty inches may be used. In this connection we notice no reference to the Duke of Westminster's narrow-gauge railway at Eaton Hall, though this is, perhaps, the most instructive example of a small and self-contained railway in the United Kingdom.

The book contains a number of folding plates, showing details of construction both of permanent way and of rolling stock; and a long appendix includes tables of returns for many railways, both of standard and of light construction, as well as the full text of the Act of 1896 and its schedules.

Les Plaques sensibles au Champ électrostatique. Par V. Schaffers, S.J. Pp. xxix + 19. (Paris: A. Hermann, Librairie Scientifique, 1900.)

THE phenomena treated of in this pamphlet are those observed when an electric discharge from a powerful Whimshurst was passed over the film of a photographic plate between two metallic points which usually were both in contact with the film. A great variety of films, containing various metallic salts mixed with different emulsions, &c., besides those ordinarily used for photographic purposes, were tried.

The potential difference used was not enough to spark across between the poles, and the changes produced in the films are probably mainly due to the current through the film, and not to the discharges through the air above it. In some cases the marks produced on the plate were approximately parallel to the lines of electrostatic force or current stream lines through the film, and several plates are given showing the effects obtained in such cases. A considerable variety of peculiar and more or less interesting appearances are clearly described, and possible explanations of them discussed. Scarcely any variations in the method of submitting the material to the action of the discharge were tried, and the object of the experimenter seems to have been more to obtain a large variety of peculiar appearances than to really elucidate the nature of the actions taking place. The method of obtaining pictures of the lines of force or current stream lines between conductors on the plates is described in detail, and such pictures as the author points out may be useful for educational purposes in some cases.

H. A. W.

The Elements of Plane Trigonometry. By Prof. W. P. Durfee. Pp. vi + 105. (Boston, U.S.A.: Ginn & Co., 1900.)

THERE are a few novel points in this book. Logarithms and their use in computations are dealt with in the first chapter, and most of the exercises are of a character which will lead the student to see that trigonometry has a practical value. The second chapter deals with trigonometrical ratios, and is followed by chapters on unlimited angles, reduction formulæ, the addition theorem, relations between the sides of a triangle and the trigonometrical functions of its angles, and solution of triangles. Logarithms are used in all the calculations. The course of work in the book is suitable for elementary students of trigonometry, and constitutes an introduction to the theory of functions as illustrated by trigonometrical ratios.

NO. 1621, VOL. 63]

LETTERS TO THE EDITOR.

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Autotomic Curves.

MR. RICHMOND'S letter appears to be written under a misapprehension. My objection to such phrases as "non-singular cubic curve," "non-singular curve of the n th order," arises from the fact that a point of inflexion is just as much a singularity as a node, and that it is therefore inaccurate and misleading to describe such curves as non-singular. In fact, the only non-singular curves which exist are conic sections; all others are singular. On the other hand, the word autotomic exactly expresses the idea it is desired to convey; and I have been informed by several excellent Greek scholars that they do not consider the phrase "an anautotomic curve" open to objection, and that the alliteration may be frequently avoided by the use of the words every or any instead of an.

The terms *secting* and *non-secting* appear to be unobjectionable from a literary point of view; but with regard to *un-autotomic* and *nodeless* there is a general consensus of opinion amongst writers who are careful about their style against the use of hybrid terms composed of words belonging to two different languages. A. B. BASSET.

Fledborough Hall, Ilolypport, Berks, November 16.

A Remarkable Dolphin.

DR. WAY, the headmaster of Rossall School, has recently forwarded to the Natural History Museum (for determination) portions of a cetacean stranded at Rossall in September. These portions include the skull, the imperfect flippers, the tail (including the caudal vertebrae), and the back-fin.

The skull and other bones leave no doubt that the animal is the bottle-nosed dolphin (*Tursiops tursio*). In place, however, of the ordinary "flukes" of a dolphin, the tail terminates in two long, narrow lobes, of which one is very much longer than the other; and, were it not placed in a horizontal instead of a vertical plane, it might well be mistaken for the tail of a thresher shark. The larger lobe of the tail measures 5 feet 3 inches, while the total length of the remainder of the creature was 10 feet. A similar abnormal elongation is noticeable in the case of the back-fin, which is about twice as long as ordinary, and proportionately slender. Externally, both the tail and the back-fin are thickly coated with small sea-weeds and sertularians.

Judging from the teeth, the animal appears to be very aged, and the only conjecture I can make in regard to the tail and back-fin is that their abnormal form is due to pathological hypertrophy, perhaps induced by an injury. I should be glad to hear of any other instances of analogous malformation among cetaceans. R. LYDEKKER.

British Museum (Natural History), Nov. 19.

The Optics of Acuteness of Sight.

OBSERVATIONS have been frequently made upon the remarkable eyesight of certain uncivilised tribes. Travellers have told us of guides who could see four of Jupiter's satellites with the unaided eye; and lately Sir Redvers Buller has declared that the average Boer can see at least two miles further than the British soldier. It is of some interest to consider whether this superiority is due to a real change in the optical properties of the eye, or merely to some special ability to interpret slight differences of impression, which might be acquired by practice. As we have as yet no data as to the constants of a Boer's eye, we may raise the question whether such feats are optically impossible for an Englishman's eye.

The minimum visual angle is determined by the transverse diameter (c) of a foveal retinal cone, and its distance ($F'K''$) from the second nodal point of the eye. We have—

$$\tan \frac{\alpha}{2} = \frac{\frac{1}{2}c}{F'K''}$$

and, where $c = .002$ mm., $F'K'' = 15.498$ mm.

$$\alpha = 26.618''$$

In order that two points may be distinguished as such by the