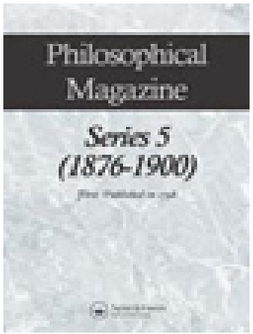


Philosophical Magazine Series 5

ISSN: 1941-5982 (Print) 1941-5990 (Online) Journal homepage: http://www.tandfonline.com/loi/tphm16

XLVI. Note on elementary nomenclature in Geometrical Optics

Magnus Maclean

To cite this article: Magnus Maclean (1889) XLVI. Note on elementary nomenclature in Geometrical Optics , Philosophical Magazine Series 5, 28:174, 400-402, DOI: 10.1080/14786448908619879

To link to this article: http://dx.doi.org/10.1080/14786448908619879

Published online: 08 May 2009.

XLVI. *Note on Elementary Nomenclature in Geometrical Optics.*

To the Editors of the Philosophical Magazine and Journal.

GENTLEMEN,

THE notation of the paper, "Notes on Geometrical Optics," by Professor Silvanus P. Thompson, in the Philosophical Magazine for October, is in many respects simpler than that used in current text-books. Sir W. Thomson, in lecturing to the Natural Philosophy Class in this University, uses a nomenclature which, so far as I know, has not yet been published. I have his permission to give the following summary of it, which is virtually a copy of a cyclostyled paper that is put into the hands of each student when Sir W. Thomson commences his lectures on Optics.

Nomenclature.

(1) The *refractivity* of a substance is the difference between the index of refraction of the substance and unity.

(2) The *potency* of a lens depends on two factors, refractivity and curvature. It is equal to the product of the refractivity into the algebraic sum of the curvatures of the lens. The *potency* of a lens is called *convergivity* when it is for convergence, and *divergivity* when it is for divergence.

(3) The *convergence* or *divergence* of a pencil of light is the reciprocal of the distance of the source, or of the image of the source, from the centre of the lens.

(4) Either convergence or divergence is altered by addition or subtraction of the potency.

(5) *Convergence* of a pencil of light after passing through lens = convergence of incident pencil + convergivity of lens. *Divergence* of a pencil of light after passing through lens = divergence of incident pencil − convergivity of lens, or = divergence of incident pencil + divergivity of lens.

Notation.

(1′) Refractivity $=(\mu-1)$, where μ is the index of refraction of the substance.

(2′) For a double convex lens, as in fig. 1,

$$\text{Convergivity} = (\mu-1)\left(\frac{1}{r}+\frac{1}{r'}\right).$$

For a plano-convex lens, as in fig. 2,

$$\text{Convergivity} = (\mu-1)\frac{1}{r};\ \frac{1}{r'}=0.$$

Fig. 1.

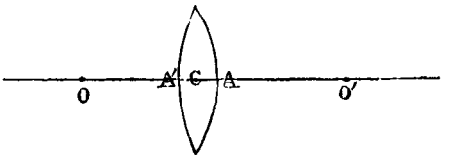
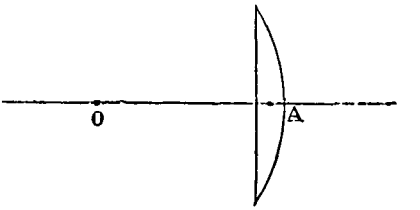


Fig. 2.

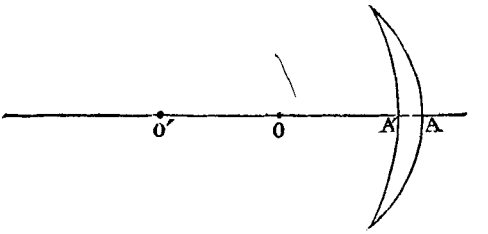


$OA = r$; $O'A' = r'$ in all the figures.

For a concavo-convex lens, as in fig. 3,

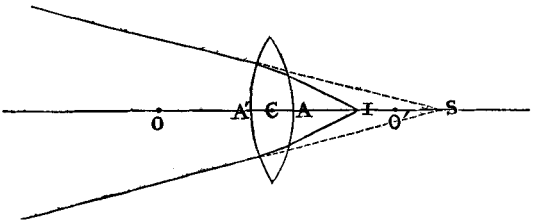
$$\text{Convergivity} = (\mu-1)\left(\frac{1}{r}-\frac{1}{r'}\right);\ r'>r.$$

Fig. 3.



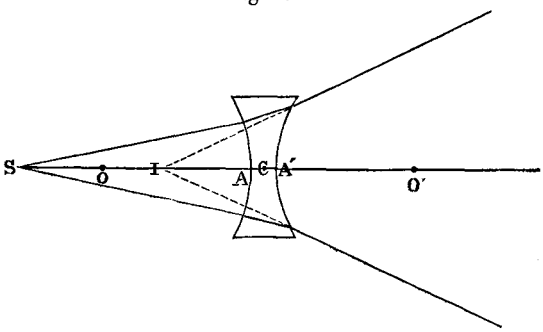
And similar formulæ for the three diverging lenses.

Fig. 4.



(3′) The convergence of the pencil of light in fig. 4, and the divergence of the pencil of light in fig. 5 = 1/SC.

Fig. 5.



(5′) In fig. 4 and also in fig. 5,

$$\frac{1}{IC} = \frac{1}{SC} + \frac{1}{f},$$

where f is the focal length of the lens.

I am, &c.,

MAGNUS MACLEAN.

Physical Laboratory, The University,
Glasgow, October 16, 1889.

XLVII. *The Constitution of the Aromatic Nucleus.* *By* S. A. SWORN, *B.A., Assoc. R.C.Sc.I., late Brakenbury Scholar of Balliol College, Oxford.**

ONE of the most important developments of theoretical chemistry in recent times has been the view that symmetry plays an important part in the aggregation of those atoms which, when combined together, form the fundamental molecular units of organic chemistry. Van't Hoff, in the case of the derivatives of marsh-gas, has brought forward views which have received much, and for the most part favourable, criticism. On the other hand the views of R. Meyer (*Ber.* xv. p. 1823) and of J. Thomsen (*Ber.* xix. p. 2944), who have each proposed a symmetrical formula for benzene, have been less favourably received.

It is a remarkable fact that closed chains consisting of six carbon atoms (never five or seven atoms) are produced by the action of dehydrating agents upon such bodies as acetone, and by other condensations. Observations on the specific volumes of aromatic compounds further show that these closed chains are characterized by a compactness of molecular

* Communicated by the Author.