Scheme for Conversion of Cylindrical Glasses

M.C.		Colenbrander
------	--	--------------

Leyden

In optical instruction it is my habit to start with the action of cylinder glasses and not with spherical glasses. A positive cylindrical lens focuses a beam of parallel rays onto a focal line. If a second cylinder of the same power is placed at right angles against the first, the focal line is transformed to a focal point.

A spherical glass has the same effect. Consequently, every spherical glass may be thought of as being composed of two cylinder-glasses of equal strength with the axes at right angles.

Every combination of a spherical and a cylinder glass can be analysed into two unequal cylinder lenses with the axes at right angles.

This leads us to a graphical representation of such combinations, which facilitates the solution of many problems for the students.

Two calibrated vertical lines are drawn parallel to each other, intersected by a horizontal line through the zero-point of calibration; thus the letter H is formed.

84 Colenbrander, Two Optical Systems of Cylinder Glasses

On the first line the strength of the first cylinder (e.g., that with the vertical axis) is plotted, on the second line the strength of the other cylinder (horizontal axis). The connecting line represents the action of the entire lens.

A single cylinder is represented by an oblique line through one of the points of intersection of the H.

By addition of a spherical lens the line is shifted upward or downward parallel to itself.

A spherical glass is represented by a horizontal line.

A cylindrical addition elevates or lowers only one terminal point of the line.

In this figure, the spherical and the cylindrical part of a lens are clearly demonstrated. It also shows how a combination with a negative cylinder can be changed into a combination with a positive cylinder.

Two Optical Systems of Cylinder Glasses.

By M. C. COLENBRANDER (Leyden).

To demonstrate what can be done with cylinder glasses

I have mounted two non-focal systems of cylinder glasses in a tube. One system consists of two cylinders of -f- 6 at $1/6$ -r $1/6$ metre = $33 \frac{1}{8}$ cm. distance

and the other of one cylinder of -f- 2 and one cylinder of -■ 6 at $1/8 - 1/6$ metre = also $33 \frac{1}{8}$ cm. apart.