curtain of the iris and to obliterate the sharp angle already described. The plane of the iris is then thrown back to a level with the circumferential attachment.

The ciliary cushion, which is at the same time, one may say, slowly enlarging by the erection of the ciliary processes &c., and which lies behind the iris, is thus instantly pressed back by the iris upon the equator of the lens, and the lens is therefore instantly accommodated for the nearer vision. The iris is thus shown to greatly increase the rapidity of accommodation.

## XIX. "On Mr. Spottiswoode's Contact Problems." By W. K. Clifford, M.A., Professor of Applied Mathematics and Mechanics in University College, London. Communicated by W. Spottiswoode, M.A., Treas. and V.P.R.S. Received June 19, 1873.

(Abstract.)

The present communication consists of two parts.

The first part treats of the contact of conics with a given surface at a given point; this class of questions was first treated by Mr. Spottiswoode in his paper "On the Contact of Conics with Surfaces," and general formulæ applicable to all such questions were given.

The results of that paper are here reproduced with some additions; with the exception of a few collateral theorems, these are all contained in the following Table:—

| | |
|---|---|
| *Number of five-point conics through fixed point .......... | = 6 |
| *Order of surface formed by five-point conics through fixed axis | = 8 |
| Number of six-point conics through fixed axis ............ | = 9 |
| *Number of seven-point conics ........................ | =70 |

The second part treats of the contact of a quadric surface with a surface of the order $n$; and in particular it determines the number of points at which a quadric (other than the tangent plane reckoned twice) can have four-branch contact with the surface. In his paper "On the Contact of Surfaces," Mr. Spottiswoode proves that at an arbitrary point on a surface there is no other solution than the doubled tangent plane, and gives the conditions that must be satisfied by those points at which another solution is possible.

The method here adopted is an extension of that applied by Joachimstal to the contact of lines with curves and surfaces. The coordinates of a point on a conic are expressed in terms of a single parameter, those of a point on a quadric by two parameters. To determine the intersection with a given surface we have an equation in the parameter or parameters; and the conditions of contact are expressed in terms of the coefficients of that equation. The special case of the intersection of a quadric with a cubic surface is treated by the method of representation on a plane.

* These results constitute the additions.