AN

INAUGURAL DISSERTATION

ON

The Anatomy of the eye.

SUBMITTED TO THE

PRESIDENT, BOARD OF TRUSTEES AND MEDICAL FACULTY

OF THE

University of Nashville,

FOR THE DEGREE OF

DOCTOR OF MEDICINE.

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1858

JOHN YORK & CO.,

BOOKSELLERS AND STATIONERS,

NASHVILLE, TENN.

The Anatomy of the eye.

The globe of the eye is composed of three tunics and three humours. The tunics are, 1st the Sclerotic and cornea, 2nd Choroid, iris, and ciliary processes, 3rd Retina and zonula ciliaris. The humours are also three, Aqueous, Crystalline, and Vitreous.

The tunica sclerotica, or external coat of the ball of the eye, is composed of opaque white fibers, of great firmness, which form a membrane of very close texture, that supports the globular figure of the eye.

It is thicker behind than

it is before; but the expansion of the tendons of the recti muscles give it a partial additional covering.

The aperture in its anterior part, which is occupied by the cornea, is not perfectly circular, but inclines somewhat to the oval form, the transvers diameter being rather longer than the vertical.

Posteriorly it is intimately connected with the optic nerve, which enters it on the nasal side of its central axis. At the entrance of the optic nerve, the sclerotica forms a thin cribriform lamella which is pierced by a number of minute foramina for the passage of the nervous filaments. The arteria centralis retinæ, enters the eye through the porus opticus.

The cornea is the transparent projecting layer that forms the anterior fifth of the globe of the eye.

It is composed of five or six thin lamella, which are connected to each other by a very delicate cellular tissues.

It is covered, anteriorly, by the tunica conjunctiva, which is closely attached to it, but may be separated from it.

The cornea is lined internally by the capsule of the aqueous humour, which is also separable from it.

The vessels of the cornea, in a healthy state, do not carry red blood

The choroid is a vascular membrane of a brown colour upon its external surface, and of a deep black colour on its internal surface.

It lines the internal surface of the scle-

rotica, and is connected to it by cellular tissue and by the passage of nerves and blood vessels.

Internally it is in contact with the retina. It is pierced posteriorly by the optic nerve, and is connected anteriorly with the iris, ciliary processes, and junction of the cornea and sclerotica, by the ciliary ligament, which surrounds the iris.

It has three sets of arteries, which are derived from the ophthalmic branch of the internal carotid, viz.

The long ciliary arteries, The short ciliary arteries, and the anterior ciliary ciliary arteries.

The veins of the choroides, send their blood to the cavernous sinus by the opthalmic vein.

The nerves of the choroides, come from the ophthalmic ganglion of the third pair.

The ciliary ligament is the bond of union between the external and middle tunics of the eye, serves to connect the cornea and sclerotica, with the iris and external layer of the choroid. It is the point to which the ciliary nerves and vessels proceed previously to their distribution.

The iris is a flat membrane, which does not partake of the spherical figure of the external coat, nor of the choroid, but extends across the cavity of the eye so as to form a septum.

The situation of the iris, in the cavity of the eye is such, that at its circumference it is in contact with the anterior edge of the ciliary ligament, and with the ciliary processes.

The pupil is a round foramen near the center of the iris, which in a healthy subject, varies continually in size, according to the degree of light to which the is subjected.

As the iris is flat, and the cornea is the segment of a sphere, there is a cavity between them.

This cavity is the anterior chamber of the eye. The iris is a septum passing across the anterior part of the eye, and separating the posterior from the anterior chamber of the eye.

The anterior surface of this membrane is very variable in its colour; in persons of a fair complexion it is lighter than in those of a dark complexion. The posterior or internal surface of the iris, like the internal

surface of the choroides, is covered with a black pigment.

The iris is composed of two layers, an anterior or fibrous, consisting of radiating fibres which converge from the circumference towards the center, and have the power of dilating the pupil, and circular fibers, which surrounds the pupil like a sphincter, and by their action produce contraction of its area.

The posterior layer is of a deep purple colour.

The ciliary ligament is a flat, gray, delicate ring, situated at the junction of the cornea with the sclieratica, which unites the external border of the iris and the ciliary body.

The ciliary body is formed by the anterior portion of the choroid coat

in contact with the ciliary ligament, and from it proceed seventy or eighty short folds which are called ciliary processes. In a healthy state of the eye, the ciliary body and the ciliary processes are covered with the pigmentum nigrum, which is more abundant upon them than upon the posterior part of the choroides.

When this paint is washed off, the processes are of a whitish colour.

The ciliary processes extend from the circumpranee toward the center, but they stop short of it; and thus include a circular aperture, which is larger than the pupil, and situated a little behind it.

This aperture is occupied by the crystalline lens.

As soon as the optic nerve passes through the choroid coat, it expands so as to form the retina.

The retina lines the choroides, and is in contact with it.

It extends from the optic nerve to the commencement of the ciliary processes. The retina has the appearance of mucus, and is semitransparent.

The retina is composed of three layers; an external, middle, and internal. The external, or Jacob's membrane is extremely thin and delicate.

It is the supporting membrane to the nervous substance of the second layer. The second or nervous membrane is the expansion of the optic nerve, and forms a thin semitransparent layer, which extends from

the optic foramen, of the choroides to the commencement of the ciliary processes, where it terminates in an abrupt scalloped margin.

The internal or vascular membrane consist of the ramifications of the arteria centralis retina, which pierces the optic nerve and enters the globe of the eye through the porus opticus.

The Zonula ciliaris is a thin vascular layer which connects the anterior margin of the retina with the circumferance of the crystalline lens. It presents upon its surface a number of small folds corresponding with the ciliary processes, between which they are received. They derive their vessels from the vascular layer of the retina.

The three humours of the eye are separately invested with a membranous capsule, which is very delicate, and perfectly transparent.

The vitreous humour occupies almost all the cavity of the eye that is posterior to the iris.

It partakes of the spherical figure of the coats of the eye.

It has a depression in the center of its anterior part, in which the posterior surface of the crystalline lens is received. It is covered by the retina as far as the retina extends.

The tunica hyaloidea, or the capsule of the vitreous humour is perfectly transparent, and very flexible.

It has some strength, for it will support the weight of all the

fluid it contains, and may be suspended from the forceps.

The hyaloid membrane is reflected inward, so as to form various cavities which contain the fluid of the vitreous humour.

The crystalline lens is situated immediately behind the pupil, and is surrounded by the ciliary processes.

It is anterior to the vitreous humour, and it is imbeded in a depression in the anterior part of the vitreous humour. It is more convex on the posterior than on the anterior surface. It is invested by a proper capsule, and is retained in its place by the attachments of the Zonula ciliaris. When healthy it is perfectly transparent, in young and middle

aged persons; but is yellowish in old age.

The crystalline lens is not so firm externally as it is internally.

The aqueous humour occupies the space which is between the crystalline lens and the cornea.

This space is divided into two chambers, by the iris, the anterior and posterior chambers.

The aqueous humour has a proper capsule, which is a thin, delicate, and transparent membrane.