

to the contraction of the lower orbicular fibres. But when the eyelids open, these fibres of the orbicularis being relaxed, the cornea pushes the lower eyelid outwards and downwards to its original place; and as this is effected by the superior oblique, acting consentaneously with the levator palpebræ superioris, my position is maintained, that the superior oblique is the muscle whose action is the real cause of the depression of the lower eyelid. Under ordinary circumstances, when we look at any thing in the line of the cheek bones, the rectus inferior, by still further depressing the cornea, becomes in a similar manner the voluntary depressor of the lower eyelid. That such is the case can be easily proved. Thus, hold the upper and lower lids of a person close to the edges of the orbit, so as not to allow any voluntary effort of the orbicularis to close the lids, then let him make the effort, when it will be found that the cornea will turn upwards and inwards under the orbit. My attention was first drawn to this fact by observing a man, who presented himself at the Eye and Ear Institution with ectropium of both eyelids of one eye. I directed him to shut his eyes (knowing that he could not do it). When he made the effort, up went the cornea out of my view, so that the man was in complete darkness, and fully under the conviction that he had both eyes shut; and when I asked him to open them, the above detailed action of the superior oblique was shown, by the cornea turning downwards and inwards, and then instantly assuming the ordinary appearance of the eyes when regarding an object.

Again, let a person close both eyes, and put a finger upon one, so as to feel the eyeball through the lids, then let the other eye be opened, when it will be found that the cornea of the closed eye will come down and press against the finger, or rather against the lower lid which the finger is on.

It may be asked, how is the cornea turned down when the eyelid is closed, if, as has been already stated, the superior oblique acts in unison with the levator? The answer is, in the same way as the inferior oblique acts when the orbicularis cannot close the eyelids. It does act, but is prevented from raising the lid by artificial means. Another answer is, as has been already explained, viz., that the eyes act consentaneously, so that one eye cannot be kept still while the other is moving, even though the one eye should be blind.

LEVATOR PALPEBRÆ SUPERIORIS.

This is a compound muscle, acting both voluntarily and by reflex stimuli, its use being to raise the upper eyelid upwards and backwards, exposing the ball of the eye, making it appear as though it were protruded. It is an antagonist to the orbicularis palpebrarum; and, as

has been already stated, acts in unison with the superior oblique. Its reflex action takes place during the rapid motions of winking. During sleep this muscle is relaxed.

ORBICULARIS PALPEBRARUM.

This is also a compound muscle of the same nature as the preceding, and antagonistic to it. With it we close the eyelids, by its superior fibres drawing down the upper lid, and its inferior fibres drawing the lower lid upwards and inwards. When danger threatens the eye, the rapid reflex action of this muscle protects it by closing the lids. It also, by its reflex action, endeavours to remove, and usually with success, any foreign body which may get under the eyelid, by directing it towards the internal canthus. This reflex action is sometimes so great (blepharospasmus), as to defy every effort of both the surgeon and patient to get the lids opened. Indeed, this effort of nature to remove foreign bodies from the eye, sometimes acts very injuriously: for instance, should the offending matter be a particle of glass, the action of the orbicularis can only make the glass stick more firmly into the part with which it is in contact. That the orbicularis acts consentaneously with the inferior oblique has been already explained. During sleep, the orbicularis muscle, like all others of its class, is relaxed; therefore the eye is not shut in sleep by the action of the orbicularis palpebrarum, but by the relaxation of the levator palpebræ superioris suffering the upper eyelid to drop down into its natural state over the globe of the eye; consequently the upper lid covers more of the eye in this state than when the lids are closed by the action of the orbicularis palpebrarum, as in the latter case the lower lid is always drawn a little upwards.

TENSOR TARSII.

The use of this muscle is to draw the puncta and eyelids into close contact with the eye, to press the puncta towards the nose, and to compress the lachrymal sac, and force out the secretion from the follicles of the caruncula. It is thought to act independently of, as well as in conjunction with, the orbicularis palpebrarum.

I cannot conclude the physiology of the muscles of the eye without mentioning a use that has been assigned to the orbicularis: it is an error, and the more dangerous because it rests on the authority of Sir C. Bell, an authority which one hesitates to doubt. He attributed to the orbicularis palpebrarum the power of pushing the eyeball back into the socket when the lids are closed, and asserted that it, with the oblique muscles, kept the eye in its place, and prevented it from protruding. This mistake will not be wondered at, when it is remembered that the power of protruding the eye he attributed to the levator. He was well aware that no muscle in the orbit had the power of retracting the eyeball; consequently he was