Antibody titers. Table III represents the correlation between the antibody titers and the rate of rejection. Most rabbits showed a low titer of antibodies, the highest being demonstrated by rabbit No. 55 which rejected both grafts on the eighth day after transplantation. Rabbits Nos. 111 and 115 which rejected the grafts at 15 to 17 days and 19 to 20 days, respectively, showed no presence of antibodies in their sera on the seventh day of transplantation. Although rabbit No. 113, rejecting the grafts at 12 to 13 days, did not show any antibody production, there was some degree of correlation between the titer of antibodies and the rate of rejection (Table III).

Discussion. The possibility of raising organ-cultured corneas in short-term cultures has been demonstrated. However, our cultured corneas were different from noncultured normal corneal buttons and the aim of significantly prolonging the take of grafts, markedly inhibiting the rejection processes, was not accomplished. Furthermore, calf corneal buttons, cultured in medium containing newborn calf serum, were rejected quicker than the noncultured buttons. These results are not in line with those reported by Summerlin and co-workers.1-7 The rejection rate of the xenografts kept in allogeneic serum of recipients was slower in some cases showing a tendency to inhibit both the first signs of vascularization and the total rejection process. Stocker, Levenson, and Georgiade6 reported that a prolonged storage of corneas in allogeneic or autologous serum for several days has a beneficial effect on the outcome of the grafting operation. This phenomenon is probably due to the "coating" of the grafts by allogeneic or autologous serum components which are presumably less stimulating for the immunological mechanism of the recipients than the xenogeneic components. The low titer of antibodies in the group of rabbits grafted with corneal buttons grown in cultures containing rabbit serum is also in favor of the mechanism of enhancement by coating, correlating well with the postulation that antigenic properties of donor grafts are reduced by storing in the recipient serum for a certain period of time prior to transplantation.1 Whether this mechanism of coating is only a momentary effect or can be modulated for a more permanent influence after longer period in culture is under investigation.

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Key words: transplantation, interlamellar pocket, corneal buttons, graft, organ culture, xenogeneic, allogeneic, rejection, implant, vascularization.

REFERENCES

A preliminary report on the supraoptic nucleus and control of intraocular pressure. CHARLES E. COX, CONSTANCE R. FITZGERALD, AND ROBERT L. KING.

Four animals received unilateral optic nerve sections which ablated that eye's rise in intraocular pressure in response to water drinking. Bilateral supraoptic nucleus lesions in two animals resulted in ablation of the other eye's response to water drinking. Both animals showed histopathologic proof of the lesion site. Two animals received sham operations for the supraoptic nucleus lesions with no change in their differential response to water drinking. This report gives preliminary evidence of the hypothesis of a supraoptic nuclear control mechanism of intraocular pressure.

Unilateral optic nerve lesions resulting in loss of vision and suspended direct, but maintained consensual pupillary light reflex alter the human eye's intraocular pressure (IOP) response to water
drinking. The increase in IOP following water drinking in an intact eye has been reported abolished in the contralateral eye with optic nerve lesions. Several studies have shown that an animal model of unilaterally transected and contralaterally sham-operated optic nerves in the rabbit can be used to examine the clinical effect observed in the human.  

Stimulation of the hypothalamus has been shown to alter IOP in laboratory animals, but further details of the underlying mechanism are unknown. The present experiment was designed on a preliminary format to use the information available in regard to hypothalamic stimulation in the animal model with a unilaterally transected optic nerve and altered response to water drinking in an attempt to establish the existence of a central control mechanism for this IOP response.

**Materials and methods.** Unilateral optic nerve transection and contralateral sham operation were performed on each of four male rabbits weighing 2.8 to 3.2 kilograms under general anesthesia in accordance with previously described techniques. The blood supply to the extracocular muscles was not interrupted and care was taken to avoid damage to vessels accompanying the optic nerve.

The animals were allowed to recover from surgery for at least five weeks and were tested for IOP response to water loading of 37.5 c.c./per kilogram. With topical anesthesia a Mackay-Marg tonometer was used to measure the IOP prior to and 30 minutes after water loading. The supraoptic nucleus was chosen as the initial site for bilateral lesions because of its proximity to the optic tracts and known associations with water balance. The scalp was incised in the midline, and bilateral burr holes were drilled through the skull 2.5 mm. anterior to Bregma and 2.5 mm. lateral to the sagittal suture. Single polar stainless-steel electrodes, covered, except at the tip, were introduced at the above coordinates 15.5 mm. below Bregma to the supraoptic nucleus. The lesions were created bilaterally in two animals by direct current electrolysis of 2.5 milliamperes. Two animals were operated on as above with the exception that they received no electrolytic lesions.

The rabbits were again tested for response to water loading as early as three days after the lesions were placed in the supraoptic nucleus. Periodic testing was performed thereafter.

**Results.** Animals were killed by formaldehyde perfusion after receiving lesions in the supraoptic nucleus. The first at three months, and the second at one week. The brains were fixed in formalin. The sham-operated animals were killed two months and one week after the surgery.

The hypothalamus was sectioned by frozen tissue technique and stained with cresyl-violet for localization of the lesions.

<table>
<thead>
<tr>
<th>Animal</th>
<th>One week postoperative change in IOP*</th>
<th>One week postoperative change in IOP</th>
<th>Two weeks postoperative change in IOP</th>
<th>Three weeks postoperative change in IOP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Op</td>
<td>Sham</td>
<td>Op</td>
<td>Sham</td>
</tr>
<tr>
<td>Test 6</td>
<td>+0</td>
<td>+7</td>
<td>+0</td>
<td>+0</td>
</tr>
<tr>
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</tr>
<tr>
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<td>+6</td>
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<td>+5</td>
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<tr>
<td>Control 2</td>
<td>+0</td>
<td>+4</td>
<td>+0</td>
<td>+6</td>
</tr>
</tbody>
</table>

*Changes in IOP in millimeters of Hg.  
Sham-operated eye.
Discussion. The animal model with unilateral optic nerve section resulting in ipsilateral alteration of IOP responses to water drinking and various drugs\(^1\)\(^2\) suggests a control mechanism mediated through the optic nerves. The hypothesis of a central control mechanism for IOP is supported by this preliminary data which suggests that electrical lesions in the supraoptic nucleus can produce a loss of the IOP response to water drinking in the eye with an intact optic nerve. Both animals receiving the lesions developed loss of IOP response to water drinking. Histologic examination of the site of the lesion one week and three months after it was applied showed damage in the supraoptic nucleus confirming that the current passed was in the site of experimental design.

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FRANK J. MACRI and STANLEY J. CEVARIO.

Stimulation of the ciliary ganglion in an enucleated, arterially perfused cat eye preparation produced a sustained increase in aqueous humor formation and an increase in the rate of aqueous