fear hemorrhage with detachment; if we have an eye which has had a violent iridocyclitis, we may have anything. The case with a healthy looking iris would look a risky case to most men, but it is not so. If the luster of the iris is healthy, there is astonishingly little risk in the proceeding I have advised. If the luster is unhealthy, it is not a proper case for any operation.

INTRACAPSULAR CATARACT EXTRACTION BY TRACTION ALONE.

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A successful and uncomplicated intracapsular cataract extraction has long been the desire and dream of many ophthalmic surgeons. Since Colonel Smith's and his followers' contributions to the subject of intracapsular extraction there has been an increasing effort to perfect such an operation, even by men who have not had the advantage of the training under Colonel Smith. Some of Colonel Smith's students have, themselves, made alterations in his successful method. The principal complication which is likely to occur in attempting the exact procedure of Colonel Smith, and the one which has deterred most ophthalmic surgeons from adopting the method, has been the more than usual danger of a loss of vitreous. There are few ophthalmic surgeons who can view a gush of vitreous from an eye with an open wound with equanimity, and those who claim that moderate loss of vitreous is of very little moment are decidedly in the minority.

Let us consider for a moment the main cause of vitreous prolapse in any cataract operation. Barring out the prolapses due to the intractableness of the patient and those due to unnecessary dragging on the eye by dull knives and unskillfully used fixation forceps, we have left the most
potent cause, namely, pressure on the eye exerted by the operator to cause the expulsion of the lens. The greater this pressure, the more the likelihood of a vitreous prolapse. When to the pressure that is ordinarily necessary to cause the expulsion of the lens in cases where the capsule has been previously cut, or the central portion removed, there is added the much greater amount of pressure necessary to break the zonule, then the danger of prolapse is markedly increased. The necessity of the excessive pressure used by Colonel Smith and his followers has prevented the general adoption of his method by any but the very few who have had the rare opportunity of acquiring the marvelous dexterity necessary for this procedure, which must be obtained if one is to perform this intracapsular method with any degree of safety. All those who express the lens in its capsule recommend that a spoon or hook be close at hand to aid in the removal of the lens if vitreous appears before the lens is out, thus acknowledging their unusual expectation of vitreous prolapse.

Shortly before the war the writer, who had tried intra-capsular extraction by the pressure method and abandoned it, was favorably impressed with the method of rupturing the zonule with smooth-bladed capsule forceps, and then expressing the lens by the method employed by Knapp. In a few cases this method was tried with fair results, and some experimental work was done on animals' eyes. The war intervened to prevent any further experiences along this line.

Some time after returning to civilian practice the writer obtained a pair of the smooth capsule forceps devised by Dr. Verhoeff, with the intention of attempting to extract the lens, with little or no pressure accompanying its withdrawal, in its capsule by means of the forceps, hoping thus to reduce the danger of prolapse. An added reason for trying this lay in the fact that for some years, in doing extracapsular extractions, it had been the custom of the writer to take out the
center of the anterior capsule with toothed capsular forceps. Therefore it was decided to attempt extraction by grasping the capsule near its center, or slightly above, so that if the capsule was torn it would be the central portion that came away. Experience seems to show that when the capsule is thus grasped the zonule can be broken all around more readily than when the capsule is grasped at the lower edge of the lens, and is less likely to tear. The results obtained have been most gratifying, and the first 25 cases form the basis of this preliminary presentation of the subject of intracapsular cataract extraction by traction alone.

The writer has not attempted any withdrawal of the lens in its capsule by traction alone by any other method than the use of the Verhoeff forceps, though the method of Hulen and Barraquer, of holding the lens by suction, seems very attractive when viewed in the light of Barraquer's results. In considering the method of extraction by traction alone as a measure of preventing loss of vitreous, one cannot help being impressed by Barraquer's figures. The ability to operate on 1000 eyes with a loss of vitreous in only 7 can probably be approached by only few operators. Even among those successful ophthalmic surgeons who always use the extracapsular method, such a minimum loss of vitreous is probably unattainable.

The writer has come to believe, from his own limited experience, that extraction of the lens in its capsule, without pressure, will in the future show less vitreous loss than in the common extracapsular method, where some pressure must be used to extrude the lens from its capsule and the eye.

Compared with Barraquer's 1000 cases and the hundreds of thousands of the Indian operators, and the hundreds of many of those who have published lists of cataract extractions, the few here presented are almost as nothing, but one cannot operate on 25 patients by one method without obtaining at least some fixed ideas as to the value of the method
employed. The writer wishes to submit at this time his first 25 cases of extraction with the Verhoeff forceps, largely in order to induce, if possible, some of his hearers to give the method, as he employs it, a trial, so that a larger number of cases may in time allow us to come to a decision as to its practicability.

First let me, as briefly and concisely as possible, outline the method employed. The patient to be operated on is, of course, prepared in the usual manner, with careful attention to the patient's general condition and his or her tractability. It is my custom to use 10 per cent. argyrol for several days prior to the extraction and, at the time of the operation, to instil a drop of one-half per cent. atropin with the first drop of 4 per cent. cocain (my cocain solution contains 1:5000 solution of adrenalin). The cocain solution is used twice, at intervals of five minutes, and this is followed by two instillations of 1 per cent. holocain, at intervals of five minutes. The eye is then flushed out with a few drops of 5 per cent. solution of protargol, and the skin surfaces around the eye and those of the lids painted with 2 per cent. iodine. The speculum is then inserted, and careful attention is paid to the position of the speculum, and especially as to whether the assistant can properly hold up the lids away from the eye by its use. This, in my opinion, is one of the most important points in the prevention of blepharospasm and losses of vitreous, and must be found more so if the patient is at all intractable. I always train my assistant to take hold of the speculum in such a manner as to lift the lids away from the eyeball after I have completed my iridectomy, and maintain them so until I am ready to remove the speculum. In some cases it may be necessary to lift as soon as the section is made. The incision is made at the sclerocorneal margin with a keen Graefe knife with two or three movements, and slightly less than one-half of the circumference is included in the incision, which is deeply made, so that
practically the entire wound is covered by a conjunctival flap. In the majority of cases it is customary at this stage to pass a suture through the conjunctival flap and then through the conjunctiva, just above the spot where it has been cut. The center of this suture is then drawn into a loop with a strabismus hook and laid to one side. This step in the operation only takes a moment, and is not attended with discomfort or annoyance to the patient. A medium-sized full iridectomy is then performed, and we are ready for the extraction of the lens in its capsule. It is at this stage of the operation that it is especially essential for the assistant to obtain his hold on the speculum and lift the lids away from the globe to be so retained until the operation is finished. The Verhoeff capsule forceps are then inserted into the anterior chamber and the capsule grasped about at its middle, or if anything, a trifle above the center. A gentle motion is then made from side to side, the extent of this movement being about one mm. each side from the center, and then the capsule forceps drawn straight upward. As the forceps begin to emerge from the eye they are pulled slightly forward and tilted forward. In the majority of cases the lens whose capsule has been thus grasped may be withdrawn from the eye without the necessity of the slightest pressure being made. The suture is then tied, if one has been introduced, and the pillars of the iris replaced. One always encounters a little more difficulty in replacing the iris where the vitreous body has come forward than in ordinary extracapsule extractions. The eye is then closed, the lids covered with sterile vaselin, with a considerable quantity placed in the hollow next to the nose. This free use of vaselin takes up any slight unevenness that may exist in the dressing. An ordinary double compress absorbent cotton eye dressing faced with linen cloth is then applied, a knit bandage fastened smoothly over this, and a Ring mask outside of all.

The writer is confident that this method of withdrawal
of the lens can be accomplished in the majority of cataract cases without endangering the integrity of the hyaloid membrane.

A very brief résumé of the results will be given without attempting to give a detailed account of each case. In 25 eyes the attempt to extract in the capsule was made, and in 3 the blades of the forceps slipped on the capsule and could not be made to grasp it. These three were then finished by using the capsulotome and extracting the lens extracapsularly in the usual way. Of the remaining 22 attempts, the capsule was torn in 1 and 21 were extracted in the capsule. In the first few of these 25 cases slight pressure was made to assist the extraction, and in 2 of these there was moderate loss of vitreous. After these two mishaps no pressure was made in any of the others, the traction on the capsule being solely relied upon. It should be stated that in the case where the capsule tore, the tearing occurred across the lower edge of the lens, and the entire capsule came away, leaving the lens to be pressed out. As might be expected, this loose lens was expelled with a minimum of pressure. The visual results so far have been 20/30 or better in all but three. Of these latter two were known to have had previous retinal and choroidal lesions, and one has retraction of the iris and vitreous opacities. The vision equals reading coarse print in one and 20/200 in the other, the poor vision of counting figures at six feet occurring in the patient having the largest vitreous loss. In the three cases where the forceps failed to grasp the capsule it should be noted that this occurred in fully matured cataracts of the sclerosed amber type, where the capsular sac was so thoroughly filled with lens that it put the capsule on a tension, making it extremely difficult to grasp it. Experience has shown that cases where intracapsular extraction by traction alone is best performed consist of the immatures, the posterior polars, and the Morgagnian cataracts. It is probable
that there is less advantage to be obtained in attempting this operation where the lens is entirely opaque and there is little likelihood of retention of cortical material.

The principal advantages of extraction in capsule it is not necessary for me to enumerate, they being too well known. There is, however, in the traction alone method, the greatly added advantage that there is a lessened danger of hyaloid rupture and the presence of free vitreous in the anterior chamber. In none of the 21 successful cases was there the slightest evidence of iritis, and the healing was unusually rapid, the average stay in the hospital being eight days.

In view of my experience let me urge those of you who are accustomed to use toothed capsule forceps for removing the center of the anterior capsule to try the smooth-bladed ones, especially on your immature cataracts, and see if you cannot lift the lens out without pressure. If the capsule then tears, you are just where you usually are after using the toothed ones and can proceed accordingly. The above, of course, presupposes that you follow the method of grasping the capsule at its middle or just slightly above.

DISCUSSION.

Colonel Henry Smith, London, England: I congratulate Dr. Greenwood on his success, although the figures are small. On his next 25 cases he may find a number with big soft cataracts in which you lift the capsule in practically every one. I saw de Wecker at work. With the vacuum method you will undoubtedly get a softer grip of the capsule than any forceps will do, and it is possible that you will get out a larger percentage of the lens with it. I agree with Dr. Greenwood that if you can lift them out this way, always providing you have good patients, you should have less escape of vitreous. The Indian method requires probably a little more technical training. This is the great stumbling-block to every operator by this method—the question of control of the eyelids. If the patient is unruly, you will
have escape of vitreous and you will have escape of vitreous with de Wecker's method. He must have had a series of good patients to get so little escape of vitreous. I have never come across such patients. I would suggest to those not so familiar with the control of the eyelids that the drawing back of the brow is just as important as lifting forward the lids. A student or a nurse, can be trained in a short time. He may not become perfect. He presses back the brow with two fingers, and enters a single hook fairly close under the eyelid. If you lift the lid forward with the hook you will be able to see the whole fornix. If your assistant is able to show you the whole fornix right around, and to maintain it at that, you will find that you will prevent the escape of vitreous. It is not so much in the manipulation, as in securing control of the patient. An incision of 180° is safe and adequate, although a little less will do. In old cataracts, the pressure at the right place dislodges the lens at once without any force. Your aim is to press the cornea at right angles to the surface of the lens, and maintain it at that. Only sufficient pressure is to be used to rupture the few fibers below. The pressure is grossly exaggerated in the minds of most people. With the big soft cataract, no forceps or suction apparatus will lift out that cataract without lifting a piece out of the front of it. I should think you would average big soft cataracts in about 20 per cent. of the cases. When you have finished with the forceps and with other mechanical measures, I think you will be tempted to go the whole hog and adopt the Indian method to finish the remainder of it.

Dr. C. F. Clark, Columbus, Ohio: Will Dr. Greenwood, in his closing remarks, state how many were mature and how many were immature cataracts?

Dr. T. B. Holloway, Philadelphia: I desire to ask Dr. Greenwood whether the statistics quoted include the first 100 cases or more that were operated by Barraquer. It has been necessary for me to review the literature of the lens, and I do not recall having seen such statistics. I make this inquiry because to the average operator in this country, 100 to 200 cataracts cover a considerable period of time and cannot be ignored.

Dr. Greenwood (closing): Barraquer distinctly says,
in his report of 1000 cases, that he did not include his first cases until he perfected his instrument. His results on 1000 cases were after he had experimented on a good many cases. I wish to apologize to Colonel Smith and the Society for coming here with just a few cases, but my object was to induce those of you who do not wish to adopt the Indian operation at once, to try first with the smooth forceps on some of these cases. Even if you do tear the center of the capsule it is of no great moment. After it is seen how easily the lens comes out in the capsule and the freedom from iritis, you may pass over from this intracapsular method to that of Colonel Smith.

THE INSERTIONS OF THE OCULAR MUSCLES AS SEEN IN TEXT-BOOKS AND IN THE DISSECTING ROOM.

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The object of this paper is to call attention to individual variations in the insertions of the extra-ocular muscles.

After the medical student has finished the usual curriculum, and attention is turned to the clinical aspects of medicine, if he is attracted to ophthalmology, naturally he begins with the usual text-books. There he finds the classic descriptions of the insertions of the different muscles. These recall to his mind a part of what he once saw, although the remembrance of dissections had already grown dim.

The fact is that the descriptions of the insertions of the ocular muscles in the ordinary text-books are too short and too imperfect to give the details necessary for accurate thought or satisfactory work. When using the scalpel and scissors, the insertion of each ocular muscle can properly be divided into two parts, the primary and secondary.

The primary insertion is that part of the muscle which is distinctly a firm and well-recognized tendon. The secondary insertion, or rather insertions, consists of those fibres of