This is the "reconstruction of the bile ducts," an operation which I believe involves a new surgical principle. If the dogs survive a month or two longer without untoward symptoms and present the same, or more favorable pathological findings, then as now, I advocate this technic in persons requiring artificial connection between the biliary passages and the intestine.

If a single hepatic duct, or the common hepatic duct, needs repair, a small tube, properly fenestrated so that it will not occlude the biliary tributaries, or the duct of Wirsung, might be passed from within the duodenum through the ampulla of Vater, up the common duct to

Fig. 7.—Specimen from Dog 5.—The aperture in the floor of the reconstructed duct, just as it enters the duodenum, is the result of a section taken for microscopic examination. A, interior of gall bladder; B, hepatic; C, cystic; D, end of common bile duct; E, reconstructed duct; F, duodenal lumen.

the point where reconstruction is desired. This would more closely approximate normal conditions.

SUMMARY

1. There is no technic for duct reconstruction in general use.

2. In the operation described the reconstructed canal is made of formed tissues, rather than inflammatory deposits.

3. Both ends are protected by mucosa.

4. There was no mortality in eight cases.

I am much indebted to Drs. H. H. Janeway and J. W. D. Maury for their kind aid.

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EXPERIENCE IN THE EXPRESSION OF CATARACTS IN THE CAPSULE BY THE SMITH METHOD *

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When Major Smith's article¹ on the extraction of cataract within the capsule by external manipulation appeared I became interested in the possibilities of the method and gave it such trial as I was capable of at that time in twenty-two cases. These were hastily brought together and not selected. The results were thought to be not satisfactory at the time and were so reported,² but further observation has shown that a very fair percentage of the patients did well. In the beginning it should be stated that I have only included in these later statistics cases of operation in which I have supervised the after-treatment and determined the refraction.

Of all the operations which have been proposed for the removal of cataract, no one of them and no combination of them offers such a complete and satisfactory disposition of the capsule, which is the beginning, middle and end of most of our after-troubles, as extraction within the capsule.³ This is so evident that if any added risk is incurred in doing the operation it seems more than offset by what is gained in the comparative freedom from the complications which are liable to follow the regular operation. Regarding these complications, Knapp long ago called attention to the fact that iridectomy alone was a comparatively safe procedure, but that opening the capsule and extracting the lens added other elements of danger to the traumatism of the iridectomy, and changed the condition to one of danger to the eye in a certain proportion of cases. These elements of danger consisted in the mechanical irritation of the lens debris to the cut and torn surface of the iris.⁴ Hess and Schirmer regard this irritation as due to infection.⁵ "It seems more than probable that the inflammation is due to the chemically altered lens substance which acts as an irritant, but whether it is trauma, infection or chemical irritation, it is generally acknowledged that the postoperative dangers—iritis, cyclitis or iridocyclitis—are in some manner attributable to the cortical debris."⁶ If the true explanation of the causes of these postoperative inflammations is to be found in either of these theories, such sequelæ should not follow delivery in the capsule, and experience shows that delivery in the capsule furnishes a high degree of immunity from them. The combined operation, in the hands of the best operators of this and other countries in 1,032 operations, according to Ring, furnished a loss of vitreous in 7.23 per cent., iritis in 13.15 per cent., incarceration of iris in 4.32 per cent., and discission was required in 26.61 per cent.⁷ According to Smith's statistics three years ago, in 2,616 operations he only had 6.8 per cent. of loss of vitreous and 0.3 per cent. of iritis in 2,494 operations when the lens came

* Read in the Section on Ophthalmology of the American Medical Association, at the Sixtieth Annual Session, held at Atlantic City, June, 1909.

1. Arch. Ophth., June, 1906.

2. Ophthalmology, January, 1907.

3. In connection with this statement the following articles will be found of interest: Capsular Complications After Cataract Operations, Brit. Med. Jour., 1905, p. 433; Knapp: The Lens Capsule in the Operation of Cataract, Tr. Am. Acad. Ophth. and Oto-Laryngol., 1905, p. 4.

4. Arch. Ophth., xli, 98.

5. Wooten, in Claiborne's Cataract Symposium, p. 163-164.

6. Stricken: Innutrition of the Lens in its Relation to Cataract Formation, Ann. Ophth., viii, No. 4.

7. Med. Rec., Feb. 23, 1905.

away whole, but when the capsule was opened intentionally or ruptured in delivery, and had to be left behind, iritis was observed in 5 per cent. of the cases.⁸ Dr. Arnold Knapp, after a visit to Major Smith's clinic at Jullundur in 1906,⁹ practically confirmed these statistics. We must, therefore, accept these percentages and seek their explanation in the marvelous skill of the operator and the comparatively early age at which cataracts develop in India. Cases of cataract, I understand, develop in persons between five and ten years younger in India than in this country. The degenerative changes of the vitreous are more marked in the ten years between sixty and seventy than at any prior period, and the con-

In July of last year, through the courtesy of Dr. Arnold Knapp, I saw Major Smith make three operations in New York City. So large a crowd was present that my view of the operations was not satisfactory, but I afterward spent several hours with him listening to descriptions of his method and seeing him demonstrate it until I thought I had a fair understanding of his technic. Major Smith regards the operation as in process of evolution. I quote from a late letter: "When once we have convinced ourselves that we are right, and have the doggedness to go ahead, our ultimate success is assured." Again he says: "You can not teach a man to do this operation by mere demonstration. He

Fig. 1.

Fig. 2.

Fig. 1.—These figures are a schematic representation of the accouchement of the lens in its capsule. Fig. 1 shows the indentation of the cornea and zonula below and the slight protrusion of the lens above.

Fig. 2.—Rupture of the zonula below and lens dropping back.

dition of the vitreous is the essential all-important element which influences statistics as to its loss, the shape of the pupil, iris entanglements, etc., in the operation.

Attention is called to the fact that the average age of my patients has been high (67.7 years). Largely because of this I think my percentage of vitreous loss has been high also. In making these later operations I had the advantage of having seen Smith perform it; I have learned by experience that the percentage of success depends more on the attainment of a high degree of skill, technical knowledge and the imitative faculty than on any skill acquired in making the regular opera-

Fig. 5.—Lens almost delivered.

Fig. 6.

Fig. 6.—Lens is wholly out but is held by some of the superior fibers of the zonula. These fibers are torn by a slight lateral rocking motion of the lens produced by the use of the hook. The lens is now delivered in its capsule.

tion. Theoretical considerations avail little or nothing in considering its place among cataract operations. The operation can be learned only at the elbow of one who is capable of demonstrating it. Without having this advantage and experience in the after-treatment of cases, no one is capable of passing judgment on the merits or demerits of the operation.

Fig. 3.

Fig. 3.—Lens is beginning to turn. The hook alone is used now and follows up the lens.

Fig. 4.

Fig. 4.—The lens has turned and is partially delivered.

must do the operation before the teacher sufficiently often to acquire confidence in himself; and, further, a trained assistant who can properly expose the eye and at the same time take off all pressure is scarcely less important to the success of the operation than the operator himself." In this connection his address¹⁰ before the American Ophthalmological Society at New London, Conn., last July, should be read. After describing the operation, he says:

The treatment of immature cataracts which I have practiced extensively, and which I am an ardent advocate of, which I regard as the operation of the future, which will leave senile cataract a much rarer condition than at present, is extraction of the lens in the capsule, a procedure to which immature cataracts are admirably suited. I hold that, if for no other reason than for the treatment of immature cataract, every ophthalmic surgeon should be familiar with the art of extracting the cataractous lens in its capsule.

I submit with diffidence that three years ago I called attention to these same points in the treatment of immature cataract,¹¹ and further experience has confirmed my belief that the method is superior to any other method of extracting such cataracts, or to any method of artificial ripening. It is in the treatment of immature cataract that I think the Smith operation will receive its first recognition, because, if I understand the opinion of the profession on this point, it is not favorable to extracting unripe cataracts by regular methods. Major Smith has

Fig. 7.—Shows the delivery of the lens in the capsule when the superior fibers of the zonula give way at the same time that the inferior fibers do. This occurs in 15 to 20 per cent. of all cases. It is in these cases that the loss of vitreous is most frequent, and that the spoon is sometimes inserted in the wound above to aid in the delivery.

8. Arch. Ophth., xxxiv, 601.

9. Arch. Ophth., January, 1908.

10. Tr. Am. Ophth. Soc., 1908; Arch. Ophth., November, 1908.

11. Ophthalmology, January, 1907.

told me that just this line of reasoning and observation with capsulotomy methods and secondary operations and accidental deliveries in the capsule are what led him to seek a method of delivering all kinds of cataracts, which would at the same time remove the capsule with the lens, because he believes such disposition of it to be good surgery.

While writers from the time of Pagenstecher to the present have considered hypermature cataracts specially suited for removal in the capsule, my experience has been that these are usually the most difficult to express. The vitreous is often fluid, the strength of the zonula, while usually frail, can not be foretold, and the milky cortex will be forced by the pressure to occupy one end of the capsular bag and the small disc-like nucleus will float to the other. I have seen this hour-glass appearance several times. These are the cases which require careful handling, since they furnish a high percentage of loss of vitreous, but the same would be true if extractions were done by regular methods. In this connection we should remember that cataractous eyes are always diseased eyes, as Risley and others have so well shown. While it is my desire to discuss the operation from my personal experience, I recognize the difficulty of placing my experience, which is limited, but, on the whole, is *favorable to the Smith operation*, in opposition to the theoretical considerations which have influenced men against delivery in the capsule, and for comparison with the vast number of reports of regular operations and published statistics by innumerable observers there are no extensive statistics of delivery in the capsule available. The fact that possibly but one operation in the capsule to five thousand or more by capsulotomy methods has been made, ought not, *per se*, to prejudice men against accepting a new procedure which, to say the least, is theoretically desirable, because from the beginning the desire of the profession has been for a method which would remove the capsule with the lens. All have recognized the undesirability of leaving it behind and the surgical incompleteness of all operations which do so. Witness the early efforts of Richter and Beer, the later efforts of Sperino and de Wecker, and the still later method of Pagenstecher and Macnamara to accomplish this end. Loss of vitreous, as a rule, in my experience, has been more the fault of the patient than of the operation. This statement does not help the matter, but it puts the blame where it usually belongs.

The fear of retinal detachment from loss of vitreous seems to be the *bête noir* of all men with whom I have discussed the operation, yet this danger is not supported by the available statistics, and it really seems to be very small. Pagenstecher more than forty years ago, in 600 operations, saw only one case of detachment of the retina, and that in a highly myopic eye with chorioiditis. Wetzel and Beer long ago stated that they had not seen harm resulting from a loss of one-third of the vitreous (by volume). Smith has stated that in his experience the same is true. Captain Lister of the Indian Medical Service, a former pupil of Major Smith's, has examined 100 cases of from one to seven years after loss of vitreous. He read a report at the Bombay Medical Congress in February; his conclusions have not yet been published, but Smith has stated that Lister did not find a case of detachment of the retina among them. It must, however, be admitted in this connection that loss of vitreous is looked on by the majority of men in this country with apprehension. Whether they overestimated its

importance or not, time and observation alone can tell. I myself have seen only two cases in which vision following the operation merely equaled perception of light, which could be attributed to detachment of the retina after the loss of about one-half of the vitreous. In these cases there was delayed healing, gaping of the wound and an ingrowth of corneal epithelium, and reduction in size of the cornea in healing, so that no view of the fundus could be had. I have not been certain as to the cause of loss of vision in these cases because P. L. remained. Several times after a slight loss of vitreous I have smoothed out the iris and have seen many cases in which it would be impossible to tell that the lens had been removed in the capsule. On the other hand, in a few instances I have bandaged up an eye with a keyhole pupil and have found the wound open, vitreous presenting and the iris entangled in the angles at the first dressing. The same condition is observed after the regular operations. These conditions are usually observed in nervous and restless patients with high blood pressure.

Loss of vitreous should not be the sole measure by which the operation is judged; if it is as serious as many think, the danger is yet to be proved. The statistics we have do not prove the danger to be great, and Smith's statistics show that with select cases it is possible to reduce it to the percentage of the regular operation or even below it. Surely comparative freedom from inflammation and high-class visual results count for more than slight loss.

Perhaps of more importance to the future integrity of the eye than loss of vitreous is the fact that no dissection is necessary. It requires no argument to show that the risk of an operation increases in proportion to the number of times a knife-needle or scissors are passed into the eye. This is also one of the essential points on which those favorable to the Smith operation based their contention, *that it is both safer and more complete than the regular operation*, even if the loss of vitreous is greater for the average operator, *which must be conceded*. This liability to accident seems more than offset by the comparative infrequency of the reactions that are liable to follow a dissection. Having had a large experience with extraction and after-treatment with capsulotomy methods, I have not seen such smooth and uncomplicated healing, all things being equal, in any other series of cases; there can be no question as to the correctness of this observation, and it is in harmony with the experience of all who are familiar with delivery within the capsule. On this point I do not wish to be misunderstood. I have encountered certain reactions, but they have not been of an inflammatory character (except in the few cases shown in the statistics), but have been connected with the healing of the section and have usually been associated with ruptures of the capsule, incarceration of iris, or cystoid healing, and blood pressure above 160 mm. Hg. in nervous and restless patients. Only two cases of iritis sufficient to cause pain and require treatment have been observed. Both followed rupture of the capsule. A few times I have observed the intrusion of a bead of vitreous into the section at the first dressing, or even later when none had presented at the time of operation. It has not been sufficient as a rule to abscise it because more will take its place, but I have always secured firm union by repeatedly tapping the chamber below, and the same practice has been successful in cystoid healing after excising the cyst.

My experience with the operation has been largely with patients of advanced years in my clinic at the National Military Home, at St. Elizabeth's Hospital, this city (and in private practice) in whom the conditions of the vitreous and fundus are frequently unfavorable to high-class results.

I pass rapidly over the corneal incision, which should be an enlarged de Wecker without a corneal flap. I have tried making a large iridectomy, and have found it to have some advantages in the delivery of the lens, but, on the other hand, as the tendency is in the direction of too large a pupil, I have made a small iridectomy as a rule. The patient can look down during the completion of the section and the iridectomy, but during the expression of the lens must look straight ahead or slightly upward, *never downward*. I have seen more loss of vitreous from the patient violating this injunction than from any other cause.

Smith's late manipulation with the end of the spatula and strabismus hook, over the lower third of the lens, by which it is dislocated, has been the most difficult step to imitate. I am conscious that failure to make this manipulation properly has been the weak point in my technic, and has materially increased my percentage of vitreous loss. I have dispensed entirely with the speculum while making the section and the iridectomy and have had my assistants use the Fisher and later the Noyes lid-elevator instead. The assistant changes to the large hook after the iridectomy, and lifts the upper lid as Smith has directed. The operator should make light or moderate pressure to and fro over the lower third of the lens with the tip of the strabismus hook. At this stage the operator will see the lower border of the lens mapped out through the cornea and iris advanced slightly, then with moderate pressure with the small end of the spatula applied edgewise across the lower sclerocorneal border the lens will advance still farther toward the incision, the zonula will give way, and the top of the lens will often tilt slightly backward. If the pressure is continued around the lower border of the lens, and the tip of the hook inserted under or behind it, the intraocular pressure will aid in causing the lens, which is now only anchored above, to describe a half-circle. The wound will gape, and the lens will emerge bottom edge upward, leaving only a small band of zonula to be loosened. This must be done slowly and with the utmost gentleness by drawing it back and forth through the incision. Otherwise the capsule will rupture and recede into the eye. It is still possible to catch it with forceps if the operator be dextrous. Vitreous is seldom lost when the lens is delivered in this way. In more than half of these cases the lens has been delivered thus. In other cases the zonula will rupture first at one of the angles of the section; then if the vitreous is fluid some of it is easily lost. It is at this point that familiarity with what may happen and skill and technic in meeting the emergency obviates some mishaps.

Before leaving these steps in operation I wish to call attention to the perfect control the assistant has over the orbicularis with the large strabismus hook under the upper lid. Slight traction with it will break the power of the muscle by bending it at a sharp angle. With a small piece of gauze on the face of his thumb the assistant pulls down the lower lid. With a trained assistant it is practically impossible for the patient to squeeze out normal vitreous. Unfortunately not all patients have normal vitreous and it is easy for the patient to lose fluid vitreous not only by attempts at squeezing but

by suddenly and forcibly looking down. So far as I am able to learn, the particular design of this large hook, and the use to which it is put, the control of the lower lid in the way described and the use of the smaller hook for delivering the lens, must be credited to Major Smith. To his credit also, I think, belong the manipulation in emergencies with the double-ended spatula, one end of which is passed through the vitreous presenting behind the lens. It should not be passed deeper than the posterior pole of the lens, while pressure through the cornea below will cause the lens in its capsule to glide up this inclined plane to its exit. In my judgment these three instruments are the best additions that have been made to the armamentarium of the ophthalmic surgeon in many years. Since I have been making more pressure with the tip of the spatula and done less rubbing over the lower third of the lens the number of cases of striped and latticed keratitis have markedly diminished, and I have not seen either remain and lower vision in any of these cases. I never use bichlorid solution in cataract operations; therefore it could not be responsible for the keratitis. There are no rules governing the amount of pressure to be used in delivering the lens. Each case is a law unto itself. Three points should be remembered: 1. The pressure should never be excessive, but steady and equal. 2. The cornea should be kept moist. 3. There should be no pressure or rubbing over the center of the cornea.

It is in connection with these manipulations that men become prejudiced against the operation when they see it performed for the first time, because they overestimate the force of the steady pressure required to rupture the zonula and dislocate the lens, and consider the manipulations rough and unscientific. I have satisfied several who have visited my clinics that the degree of pressure used is not great, but is much more apparent than real. In other words, they have unlearned some of their misconceptions regarding this important step of the operation.

The lens having been delivered, the iris, if prolapsed, should be returned and smoothed out, but the danger of loss of vitreous should not be forgotten in doing this. Usually it is best to bandage the eye as soon as possible. Intrusion of fluid vitreous into the wound has not influenced the healing materially. The toilet should be made according to the taste of the operator. I prefer a half-round dry cotton patch between layers of gauze laid on the closed lids of each eye. The irregularities are filled out with small pledgets of picked cotton which are held in place by pieces of adhesive straps. I prefer a flannel bandage for the class of patients on whom most of my operations have been performed—old soldiers, many of them feeble in mind and body, bad subjects, as a rule, for any operation. The eye should not be open for three or four days unless the patient complains of pain, which is so exceedingly rare that freedom from discomfort or pain can be regarded as one of the striking characteristics of the method. On removing the dressing freedom from discharge and the normal appearance of the eyelid are usually noticeable. As a rule, the wound will be found closed and the chamber established at this first dressing; if not closed the usual conditions will be found present. The appearance of the clear black pupil is very gratifying and the distinct tracery and pattern of the iris, and its response to atropin, if used, shows its freedom from inflammation. The conjunctiva usually takes on a blush

of irritation or congestion. Rarely will the deep redness and chemosis of inflammation be seen. The amount of photophobia and lachrymation will vary with the condition of the wound. I have seen only two cases of genuine iritis in these seventy-five cases. In each the capsule had ruptured and only two scissors operations have been made for up-drawn pupils in these

same cases. Striped and latticed keratitis have caused more uneasiness and required more treatment than any other complication, yet, as already stated, I have not seen either remain and lower vision in any of these cases, and the same can be said of disturbance in the epithelial layer of the cornea from the pressure.

As a rule vision is not high at first, because of ker-

TABLE OF RESULTS OF SMITH OPERATION IN 75 CASES

No.	Age.	Eye.	Condition of Cataract.	B. P.	Lens Delivered.	Capsule.	Vitreous Loss.	Iris.	Chamber Formed.	Vision.	Remarks.
1	73	L.	Im.	140/110					2d day.	20/20	
2	71	R.	M.	190					14th d.	20/30	Presenting vitreous; tenth day passed knife through wound; firm union.
3	61	L.	M.	190					3d day.	20/20	
4	60	L.	M.	210/130		Ruptured, retained.		Iritis.	14th d.	20/20	Dissection.
5	75	R.	Hm.	160/120					3d day.	20/20	
6	68	R.	Im.	190/130					4th d.	20/30	
7	49	R.	M.	120/100					2d day.	20/15	
8	76	R.	M.	200/130					3d day.	20/20	Wound opened after 1 week. T = + 1; chamber formed next day.
9	60	L.	M.	190/130	Spatula.		Slight.		4th d.	20/70	Myopia and chorioiditis.
10	65	L.	Hm.	165/130		Ruptured.			3d day.	20/50	Some capsular remains;
11	70	L.	M.	190/140					14th d.	20/30	Delayed healing; vitreous protruded 3d day; seven punctures made; firm union.
12	75	R.	Im.	210/160					2d day.	20/70	Feeble minded; delusions; vision partly estimated.
13	58	R.	Im.	180/140			Slight.		3d day.	20/50	Incipient choroiditis.
14	56	R.	Im.	145/110					5th d.	20/30	
15	67	L.	M.	185/130					3d day.	20/20	
16	60	R.	Hm.	190/130	Spatula.		Slight.		4th d.	20/70	Myopia and chorioiditis.
17	45	R.	M.	140/100					2d day.	20/30	
18	61	R.	M.	190					3d day.	20/20	
19	76	L.	M.	200/130					3d day.	20/20	
20	50	R.	Im.	136					5th d.	20/15	
21	72	L.	M.	115/75					4th d.	20/20	
22	76	L.	Im.	250/175					4th d.	20/40	Slight keratitis cleared up; incipient choroido-retinitis.
23	71	R.	Im.	140/90					3d day.	20/20	
24	63	L.	M.	190/115			Slight.		12th d.	20/20	Delayed healing; no cause apparent.
25	82	L.	M.	170/130					5th d.	20/20	
26	62	R.	Im.	165/130					5th d.	20/20	
27	65	R.	M.	180/130			Slight.		3d day.	20/20	Small hemorrhage into anterior chamber.
28	75	L.	M.						2d day.	20/20	
29	64	L.	M.	145/105					4th d.	20/20	
30	70	R.	M.	153/116					2d day.	20/20	
31	62	L.	M.	150/116					4th d.	20/20	
32	68	L.	M.	130/90		Ruptured, retained.		Iritis.	3d day.	20/50	Oct. 20, '08, iridotomy; Jan. 29, '09, iridotomy.
33	64	L.	M.	160/120			Considerable.	Incarcerated.	14th d.	20/30	Pterygium, cystoid healing, abscessed; healed.
34	87	R.	M.	180/140	Spatula.		Marked.		3d day.	20/30	Feeble mentality; vision partly estimated.
35	77	R.	M.	140/90					3d day.	20/30	
36	77	L.	M.	230/150					3d day.	20/20	
37	70	R.	M.	170/130					4th d.	20/40	Feeble mentality (complained of pain during convalescence.)
38	70	L.	M.	170/130				Incarcerated.	14th d.	20/50	Feeble mentality; vision partly estimated.
39	65	R.	M.	160/110					4th d.	20/30	
40	68	L.	M.	140/110					4th d.	20/40	
41	76	L.	M.	150/100					2d day.	20/30	Delayed healing; a head of vitreous abscessed on fifth day. Prompt healing.
42	76	R.	Im.	150/100					5th d.	20/50	
43	77	R.	M.	180/110					4th d.	20/30	
44	73	L.	M.	22/160					3d day.	20/20	
45	73	R.	M.	220/160	Spatula.		Excessive.		4th d.	P. L.	Restless; unruly; fluid vitreous.
46	77	R.	M.	230/150					4th d.	20/20	
47	87	L.	M.	180/140				Incarcerated.	17th d.	20/30	Feeble mentality.
48	64	R.	M.	160/120			Slight.		4th d.	20/30	
49	71	R.	M.	200/140					5th d.	20/20	
50	63	L.	M.	150/110			Slight.		7th d.	20/20	
51	75	R.	M.	150/110					4th d.	20/20	
52	73	L.	M.	140/120				Incarcerated.	19th d.	20/30	
53	69	L.	M.	150/120	Spatula.				3d day.	20/20	
54	74	R.	M.	170/120					2d day.	20/20	
55	66	L.	M.	210/140					7th d.	20/20	
56	66	R.	Im.	210/140					2d day.	20/20	
57	86	R.	M.	170/130		Ruptured.			7th d.	20/50	Feeble-minded.
58	74	L.	M.	210/150					8d day.	20/50	
59	68	R.	M.	220/140					7th d.	20/20	
60	61	L.	Im.	185/118	Spatula.				7th d.	20/30	
61	67	L.	M.	160/120					14th d.	20/40	
62	75	R.	M.	190/140					3d day.	20/30	
63	72	L.	Im.	190/140					3d day.	20/30	
64	67	R.	M.	200/150	Spatula.		Slight.		3d day.	20/30	Slight keratitis cleared; very unruly
65	63	R.	M.	150/120					5th d.	20/30	
66	53	L.	Im.	140/100					10th day.	20/15	Striped keratitis. Cleared up.
67	81	R.	Im.						2d day.	20/70	
68	73	L.	Im.	200/170			Slight.		4th d.	20/0	Slight keratitis cleared up.
69	67	R.	M.	150/120					2d day.	20/20	Unruly; vitreous escape after delivery.
70	76	R.	M.	100/130					3d day.	20/40	
71	70	L.	Hm.	140/120					3d day.	20/70	Incipient macular chorioiditis.
72	74	R.	M.						3d day.	20/50	
73	70	R.	M.						3d day.		
74	88	R.	M.								Infection; panophthalmitis (chronic cystitis.)
75	60	L.	M.	150/110					7th d.	P. L.	Very unruly; globe collapsed; salt solution injected; invagination corneal flap; probable hard detachment of retina.

atitis in some cases, but more often from disturbance in the anterior layers of the vitreous which resemble miniature ridges and valleys, running perpendicularly. These have not the appearance of striped keratitis. Pagenstecher noted this condition.¹² They seem to smooth down gradually and vision reaches its best in from one to two months. The degree of astigmatism, which is usually from 2 to 4 D., has not varied much with the healing, when primary union has taken place.

For the purpose of comparing the results obtained with the combined method of extraction, I have appended the statistics of the last 75 operations in the Soldiers' Home Hospital, with the statistics of 75 cases in which operation was done by the Smith method; 52 of them in the Soldiers' Home Hospital and 23 in St. Elizabeth's Hospital. The conditions have been as uniform as possible. The average age of the patients operated on by the regular method was 69.76, and for the Smith operation 67.7 years. The number of patients operated on by each method is too small to draw any definite conclusions from, yet they are believed to have sufficient value to justify comparing them.

Expression within the capsule offers the following advantages:

1. A cataract can be removed at any stage.
2. No discission is ever necessary.
3. There is comparative freedom from postoperative inflammations.
4. There are no capsule entanglements; prompt healing is the rule.
5. The method is especially adapted to institutional work; one operation does all.
6. No ripening methods need be tried.
7. The result is better average vision, which does not change with time, if the fundus conditions remain favorable.

The disadvantages of the method are the following:

1. The only important one is greater liability to loss of vitreous for the average operator.
2. From a cosmetic point of view the wide updrawn pupil (if it results) mars the appearance of the eye, while it may not be a disadvantage to vision.
3. And lastly, a skilled assistant is always necessary in performing the operation.

It is not my desire to be considered a champion of the Smith operation until I have seen more of the ultimate results which follow it, among white people, living under different climatic and dietetic conditions than average Indians, but having emphasized its strong points, and admitted its weak points as I have seen them, I can not avoid the conclusion that it is a long step toward the ideal operation which we are all seeking. Perhaps it will not be so in the hands of every one, but in the hands of the few who will learn to do it well I believe it has a promising future. The statistics which follow have been compiled by my hospital associate, Dr. J. W. Millette. It is a pleasure to acknowledge the thorough and careful manner with which it has been done.

These statistics do not include all the operations I have performed. Cases have not been selected, but I have excluded all cases in which I have not given the after-treatment and done the testing for vision and also those cases which from the condition of the cornea, vitreous and fundus, were not proper ones from a visual point of view. Two patients whose cases were

considered proper had excessive loss of vitreous and vision only equal to P.L., which are fairly chargeable to the operation; one has dense vitreous opacities, probably from hemorrhage, the other lost about half of the vitreous. He has an up-drawn pupil, and no view of the fundus can be had. I am not certain as to the cause of the loss of vision in either case, and one other case was lost from infection.

SUMMARY OF VISUAL RESULTS

Total Number.		With Loss of Vitreous.	
Cases.	Vision.	Cases.	Vision.
3	20/15	4	20/20
30	20/20	2	20/30
18	20/30	3	20/50
4	20/40	2	20/70
9	20/50	2	P. L.
5	20/70		
2	P. L.	13	
1	No record		
3	No record	1	With Rupture of Capsule.
75		3	20/20
		1	20/30
		4	

Average vision for 72 better than 20/30 about 20/27, to be exact.

SUMMARY OF ACCIDENTS AND BLOOD PRESSURE

Vitreous loss; healing delayed more than five days.			
Cases.	B. P.	Cases.	B. P.
3	150	2	150
2	160	2	160
3	180	2	170
4	190	1	180
1	200	1	185
1	220	3	190
13	Average B. P. 175.4	2	210
		1	230
		14	Average B. P. 174.6

For comparison, with results obtained by the Smith operation, I submit the following statistics from my last seventy-five regular operations compiled by my assistant, Dr. W. C. Cook, National Military Home:

Cases.	Vision.	Cases.	B. P.
10	20/20	5	20/200
16	20/30	1	Fingers at 6 feet
17	20/40	1	P. L.
10	20/50	1	0
5	20/60		
2	20/70	75	Average vision 20/40
7	20/100		

One patient had slight loss of vitreous; 2 had slight attacks of glaucoma; 20 had a degree of iritis requiring treatment; 35 eyes required discission; 9 patients whose eyes needed discission refused it; 1 eye was lost by iridopyelitis after a secondary operation.

THE EXPRESSION OF CATARACT IN ITS CAPSULE

WITH REPORT OF FORTY OPERATIONS *

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Delivery of the lens in its capsule has been an occasional accidental accompaniment of the cataract operation experienced by most operators ever since the beginning of cataract extraction, by reason of unwonted pressure on the globe by the operator or by the patient squeezing his lids (Case 10), during which more or less vitreous has been lost. It may also be occasioned knowingly, though unwillingly, by reason of rupture of the zonula after incision of the cornea when the operator has passed a spoon behind the lens lifting it out, or when he has premeditatedly removed a dislocated lens by the same means. Over-ripe and Morgagnian cataracts have occasionally likewise been removed by much

* Read in the Section on Ophthalmology of the American Medical Association, at the Sixtieth Annual Session, held at Atlantic City, June, 1909.