lengthways of the orbit within the capsule just as if a finger had been pushed below the eye and the first two joints left therein; an extraordinary form and position, and was really a "floating" tumor.

On section it cut like liver, showing a complete capsule around it; the report of the pathologists being as follows: "The weight of tissue after fat had been dissected free from tumor was 10 grams. The tumor measured 4 cm. in length and $1\frac{1}{2}$ cm. in thickness. This specimen must be stated as

being a hyperplastic lymph node, a lymphosarcoma or small round cell sarcoma. It is composed of small round cells with a scarcely perceptible stroma. No lymph follicles are in evidence. The nodules adjoining the main tumor are of like structure."

Dec. 10th, 1919, altho only a little over one month is passed since the operation, there has apparently been no return of the growth as yet. It is possible that the neoplasm arose in a lymph node and was isolated.

SOCIETY PROCEEDINGS

COLORADO CONGRESS OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

Ophthalmic Transactions

August 4-5, 1919.

The Capsule in Cataract Extraction.

EDWARD JACKSON, Denver, pointed out that the capsule of the crystalline lens varied in thickness at different distances from the center of the pupil. If it had the same index of refraction as the lens its refractive effect would be that of a concave lens of 0.12 to 0.25 D. Irregular thickenings, forming nodules, such as are found on other hyaline membranes and have been observed with hypermature cataract, might produce a dispersion of light comparable to that of ground glass.

The capsule itself is passive, whatever changes occur in it must be due to the epithelium adherent to it, and to other tissues that become associated with it. In the senile eye the changes due to epithelial activities are probably very slight. The membranes developing in the pupil after cataract extraction have for their most important constituent connective tissue, developed from fibroblasts furnished chiefly by the iris. The density of such membranes after cataract extraction is connected with the severity and persistence of postoperative inflammation.

Such inflammation is largely due to lens substance, remaining in contact

with the iris. It is generally absent after intracapsular extraction, after thoro routine irrigation of the anterior chamber following extraction; and also after the operation with peripheral capsulotomy, when all cortex left within the eye is left in the capsule and not in contact with the iris. Such a capsulotomy is made by bringing the back of the knife into the corneal incision, withdrawing it until the point is at the edge of the pupil and making a puncture in the capsule as wide as the pupil. The capsule then easily tears sufficiently to permit the exit of the lens. Satisfactory clinical experience with this method had been reported previously.

Discussion: Marcus Feingold, New Orleans. The superficial incision mentioned by Jackson has other advantages, not so far brought out. Secondary cataract is also produced by the fact that the little blood left in the anterior chamber after a cataract extraction is likely to lead to very dense opacity in the capsule. Blood left in the anterior chamber will be easily absorbed over the surface of the iris itself, thru the crypts, but over the lens capsule it will be absorbed less readily. If there is an opening in the lens capsule it is likely to lead ultimately to rather dense opacity. If we would all use the peripheral incision recommended by Dr. Jackson, we should be less subject to opacity from hemorrhage in the anterior chamber.

Arnold Knapp, New York. The method used by my father, Herman Knapp, for many years has the advantage of avoiding adhesion of the capsule to the lips of the wound. It does allow of secondary cataract. My father did not consider a cataract operation complete until he had done a secondary operation. Personally, I think that in cutting the capsule it is important to get a large opening, to render retained cortex freely accessible to the aqueous. The histology of secondary cataract seems to me to show it definitely to be due to proliferation of the capsular cells, which are apparently converted into connective tissue. The secondary cataract in many cases is not due so much to formation of secondary membrane as to wrinkling of the posterior capsule. It is not possible to guarantee that secondary cataracts will not follow in any case by any method. Using the capsule forceps, you do not know how much of the capsule you remove, but are liable to have tags left which may cause complications. The Kalt forceps, forming a cup and without teeth, avoid this difficulty, because you are able to remove the largest amount of anterior capsule possible by any procedure. And yet it is not possible to guarantee that secondary operations may not be necessary on account of wrinkling of the posterior capsule.

Melville Black, Denver. For a number of years I used the cystotome, and it seems to me that after I began to use the capsule forceps I was better pleased than I had ever been with the capsular results. I have used a number of different capsule forceps, but still go back to the Knapp forceps, which is a very convenient instrument to use. The large opening left by the forceps is quite noticeable, and I do not believe I do a secondary operation in ten per cent of my cases. It also seems to me that I have had less reaction after the operation by this method.

F. E. Wallace, Pueblo. I bent Knapp's forceps and made the shaft malleable so that it could be bent in any direction. I made a V-shaped in-

cision at the sides, and then the Knapp opening above. But still in a number of cases we have to have a secondary operation. For a simple wrinkling I think the Knapp needle knife still the best instrument to use; but if we have secondary inflammation some other operation is desirable, such as the V-shaped operation with the Ziegler knife. If the secondary cataract is very dense, then the method advised by Fox is one of the best. Another excellent method is that of Knapp, puncturing the membrane, and then removing a portion of the capsule or iris with the hook.

Edward Jackson (closing). Dr. Knapp mentioned occlusion of the capsule incision. I am satisfied that this occurs. In one case where the lens was extracted for very high myopia, and a large amount of clear cortex was left, it became hazy immediately after the operation. But it was not disturbed for some time, and after some weeks there was a distinct clearing, so that more reflex could be obtained. As Dr. Black says, the removal of the anterior capsule leaves a clearer opening. But I have a good deal of faith in the ability of the eye to deal with remaining cortex. In nine cases out of ten, before many weeks the bulk of the cortex would be absorbed. The eye often continues to clear for a long time, so that the pupil may be clear at the end of six weeks.

I am skeptical as to the opacity arising from the cells of the anterior capsule. I think Parsons is correct in believing it to arise from fibroblasts derived from the iris. The presence of blood as referred to by Dr. Feingold as favoring the development of fibroblasts, is perhaps responsible for some of the thicker membranes. As to the danger of secondary glaucoma from included capsule tags, as mentioned by Dr. Knapp: this is the probable cause in the majority of cases of secondary glaucoma after cataract extraction. There are now enough lenses being taken out in the capsule to furnish valuable information, which we lack, as to the condition of the capsule in senile cataract.

The Capsule in Secondary Cataract Operations.

L. WEBSTER FOX, Philadelphia. My experience leads me to believe that where we have a thoroly mature cataract, secondary complications follow in only about 25 per cent of the cases. It is in the immature cataracts that the percentage is reversed.

Having had the opportunity of seeing the Vienna, French and English methods and practising all of them, I shall briefly describe them in turn.

In Vienna, at the hands of that skilled operator, Mauthner, we were taught to use the Langenbeck knife; a delicate sickle-shaped instrument of which the Ziegler knife is a model. Arlt, Stelwag and Fuchs used knife needles and delicate needles lacerating the capsule by such means.

In Paris, de Wecker, Landolt and Panas had different methods. De Wecker made a vertical incision with a broad knife needle thru the cornea and capsule, one or two lines from the inner margin in the right eye, and on the outer side in the left eye, operating from the front. Then with a de Wecker scissors entering this incision, passing the blade in front of the capsule in the anterior chamber and second blade behind the capsule, with one cut of the scissors making a wide opening in the obstruction.

Landolt and Panas used knife needles as well as the Bowman stop needle.

In London we were taught to follow the method of Sir William Bowman—to use two needles to open the capsule. These needles are now so well known as the Bowman stop needle, that I shall not describe them. Not all the London operators used this method. Some used the modified Langenbeck, others the de Wecker method; but the majority followed the teachings outlined by Sir William Bowman.

Having had experience with all these methods, I have for many years followed de Wecker's teachings, that is making a vertical incision thru the cornea and capsule with what is known as the English broad needle, then snip-

ping the capsule with a small de Wecker scissors.

My reasons for selecting this method are freedom from using force in lacerating the capsule; and no pulling on the ciliary body, which is an important factor in causing cyclitis. That with a single knife like the Langenbeck or Ziegler this complication would probably not take place in a translucent capsule, goes without saying, but it is certainly a factor in dense capsules.

The Bowman stop needle has its advantages, that not much traction is used on the ciliary body in making a clear opening in the media. But the two punctures in the cornea may be two foci of infection and as needles do not cut the cornea but make a puncture which bruises the fibres of the cornea at their entrance, I have long ago discarded this method, as I look upon it as being not without risk, especially in those cases where the primary operation was delayed in healing. Having eliminated all the causes which may lead to trouble, I now only follow the de Wecker method as described above.

Some critics may consider that the vertical incision in the cornea lends more space to infection than the smaller apertures made by the more delicate instruments. In rapidly healing cataracts I take no other precautions than are usually followed in my cataract operations, but in a slowly healing cataract, I add to the usual care of asepsis, a 5 per cent solution of trichloroacetic acid applied to the lips of the incision.

Another important factor is when to perform a secondary operation. In rapidly healing cataracts two to three weeks has been my selection and I have been successful. Where the time of healing has been lengthened, I wait six to eight weeks, and where the patient has 20/40 to 20/50 vision or thereabouts, and there is no particular urgency for reading or near work, I postpone the operation even up to six months. I wish to state that I take all the precautions for this operation that I do in the primary cataract operation.

Observations on Refraction.

This paper, read by I. W. Haughey, is published in full on page 197.

Discussion: W. H. Crisp, Denver. The most difficult problem in connection with refraction is the teaching of the subject. Most men are given a very small amount of initial teaching, and are then left to "pick up" the work for themselves. The only way to get a proper general training of refractionists is to give a great deal of individual instruction in each case. This of course can only be satisfactorily accomplished by spending a great deal more money on the teaching of refraction than is done at the present time. Unfortunately, leading refractionists do not even agree thoroly as to methods, either in examination or in prescribing.

The principal errors in refraction work are: (1) undercorrection of hyperopia and astigmatism; (2) inadequate precision in ascertaining the axis of an astigmatic correction; (3) carelessness in balancing the amount of correction given for each eye; and (4) the overcorrection of myopia, or the substitution of a myopic correction for a hyperopic.

The frequency of occurrence of latent hyperopia is commonly overestimated. In the majority of cases which I examine there is really no latent hyperopia, that is to say no hyperopia which cannot be discovered without the use of a cycloplegic, if sufficient care and proper methods are employed. A great help in the revealing of the full amount of hyperopia, and one by no means generally resorted to, is bilateral fogging. It is often possible by simultaneous fogging of both eyes to discover a considerably greater amount of hyperopia than is found by unilateral fogging. By bilateral fogging, moreover, one is able to balance the two eyes much more accurately, in the very usual type of case in which visual acuity is possessed by both eyes.

The problem of the correction of what most men call latent hyperopia is really the problem of obtaining gradual relaxation of accommodation. I have found few patients who were

really conscientious in constantly wearing their lenses who were unable finally to relax their accommodation for a full correction of hyperopia. But persistence is absolutely necessary for this, and cannot always be obtained. I do not agree with Dr. Haughey as to the correction of hyperopia in children, as in a great many instances its full correction is just as essential as in adults. In children, moreover, a full correction of all the hyperopia found, even under cycloplegia, is usually much more readily tolerated than in adults.

Whether hyperopia is the normal condition or not, it is unquestionably capable, even in small amounts, of producing marked symptoms which are ordinarily completely relieved by its correction. Since on looking away from close work the hyperopic eye is unable to obtain that condition of rest which is obtainable by the emmetropic or properly corrected eye, even moderate amounts of hyperopia represent in my opinion an imperfection of adaptation of the eye to modern requirements.

A half meter is a very convenient distance for retinoscopy, and a convenient way to check one's distance from the patient is to have a string a half meter long attached to the retinoscope. As regards the wearing of tinted lenses, I agree with Dr. Haughey in the main, and am further of the opinion that most people who demand tinted lenses do so because they have been incorrectly refracted. The accurately refracted eye is not ordinarily unduly sensitive to changes of light, altho during very long exposure to intense light the tinted lens is a comfort.

Edward Jackson, Denver. Two recent cases suggest the inability of some ophthalmologists to think that there may be anything unusual in a particular case. One was that of a woman who was doing close work, wearing a plus 4.50 diopter correction, and yet with the bilateral fogging method mentioned by Dr. Crisp she took 5.50 diopters. The only way to succeed in diagnosis is to assume that

the case is an unusual one, and to be sure that you look well beyond the possibilities of it.

J. L. Sutherland, Denver. I find that the personal equation is important in many cases. I did not hear the essayist say what he would do in a case of hyperopia in one eye and myopia in the other. I have had two cases of this kind within the past few weeks. In one case of this sort the patient had been unable to wear the lenses previously given, and I corrected each eye just as I found it, with the result that she has been comfortable for three months. I am sorry to read in our journals of ophthalmology so many diverse opinions of many men, especially in the same issue of the paper. If we are sure we are right in the measurement of hyperopia I believe we should give the full correction in every case.

Melville Black, Denver, compared refraction with fishing, and suggested that there were only born refractionists and only born fishermen, and that the two qualifications were not always combined in the same person. He had used for many years the method of estimating astigmatism described by the author of the paper, and believed to be a first class method.

F. E. Palmer, Sterling, Colorado, described a case of marked astigmatism in which he had seemed to get better results by the correction of astigmatism in the same eye at two different axes by means of cylinders ground on either side of the same lens.

I. W. Haughey (closing). As regards the correction of latent hyperopia my remarks applied only to the young, as after thirty-five years of age I believe the full correction should usually be given. The total hyperopia and the total myopia should in my opinion be thoroly corrected in such a case as mentioned by Dr. Sutherland. I have usually got about 0.25 more sphere with the retinoscope than with the chart.

Tuberculosis of the Eyes in the Army.

H. H. STARK, El Paso, Texas, read the paper to be published later.

DISCUSSION: Edward Jackson, Den-

ver. Dr. Stark's paper illustrates one of the very striking medical aspects of the war, at least as regards their incidence in young men. We have learned frequently the prevalence of many conditions that we did not have reliable statistics on before. This probably applies more to tuberculosis apart from pulmonary tuberculosis than to most other conditions that have been studied. The difficulty in the study of these cases is the brevity of the time that the patients were under observation. To get an idea of the complete course of such cases we shall have to rely chiefly upon cases seen in private practice. I have a case in which five years ago Dr. Knapp made a diagnosis of ocular tuberculosis in New York; and who later came under my observation in Denver, altho he has not been deemed a generally tuberculous patient.

In the cases which Dr. Stark had time to detail, the thing that struck me was the occurrence of what we should formerly have regarded as an acute iritis. We should look for syphilis very persistently in these cases, altho often that is the wrong direction, and the search is a waste of energy. We have not yet a very broad conception of the causes of acute iritis. Quite possibly in these acute cases we ought to think equally of tuberculosis as the cause. With reference to the tuberculin treatment, the point brought out by Dr. Stark as to only treating these cases once a week is very important. The improvement he had is exceptional and one that I have not had in any case. Our attitude with reference to tuberculosis will have to be that we are not certain of the cure until the patient is dead, and that we must look out for recurrences for years to come.

W. C. Finnoff, Denver. The experience of most ophthalmologists has been that it has taken a long period of time before any improvement was noticed. The great principle is cautious injection of tuberculin and observation of the retina following injection. If the injection is too large we are liable to have large hem-

orrhages and generally increased disturbance following the injection.

Arnold Knapp, New York City: Are we not remiss in these cases in not trying to find out a little more about the primary lesion? The previous history of the patient is of great importance, and another detail which we have overlooked is X-ray examination of the chest. I do not think we ought to make a diagnosis from the tuberculin test unless we get an actual reaction in the eye. Rapid improvement after injections is a cause for suspicion, that we have overlooked the true etiology. In many of these cases we have probably to do with more than one cause.

J. A. Patterson, Colorado Springs. Some of the first work in this country on X-ray examination of the chest was done by Solly of Colorado Springs; and it has now become a routine practice among the men of Colorado Springs who do tuberculosis work.

Dr. Stark (closing). I fear I have often persisted with treatment for syphilis when the condition was really tuberculosis. I believe with Dr. Knapp that we must not depend merely on the temperature and the skin reaction; but must have with these the reaction in the eye. All my cases in private practice are gone over by an expert, and where he thinks there is any doubt an X-ray of the chest is made.

Unusual Fundus Condition.

W. C. FINNOFF read the paper published p. 161, and exhibited the sketch reproduced in Plate III.

DISCUSSION: Marcus Feingold, New Orleans. If I had not asked Dr. Finnoff beforehand whether his picture represented a direct view of the fundus, I should have said that I had seen similar cases before in my own practice and in the literature. The cases in the literature, and those which I have seen, are all directed downward; and they are easy to explain if we think of the embryonic cleft in the choroid, but to explain Dr. Finnoff's case is much more difficult. It has been proven that the eye during development rotates in the orbit, so that

the cleft is temporarily turned in some instances, but it is hard to believe that the eye might have made a rotation upward of one hundred and eighty degrees. (See page 161.)

Observations on Trachoma.

L. H. BUXTON, Oklahoma City, reported some of his personal experience with trachoma.

DISCUSSION.—J. J. Pattee, Pueblo. As to the doctor's statement about the high percentage of errors in data pertaining to the incidence of trachoma, my experience and observation, tho limited, correspond with his. For five years I practiced at a miners' hospital at Gallup, New Mexico, near the Navajo Indian Reservation. I saw many Indians from the reservation and a number worked for the company I served. There were many cases of external eye affections, including some trachoma, but most of the cases were old standing neglected conjunctivitis and blepharitis. Trachoma was not more frequent than among other races correspondingly dirty and unhygienic. The type of physician employed to care for the Indians was, as a rule, one who knew very little about the eye and whose duties were general practice and administration. Great reliance should not be placed on their figures pertaining to trachoma.

Trachoma should be carefully diagnosed. If a child is excluded from school, if a man is excluded from employment by an industrial organization, or if a patient is refused admission to a general hospital on the ground that he has trachoma when in reality he has only a conjunctivitis, we have imposed an unjust burden upon the man and the community also suffers.

Many physicians, nurses, and laymen have an undue fear about so-called "granular lids," and they deprive suspected cases of privileges enjoyed by others.

J. B. Potts, Omaha. The doctor's statements about coincide with our observations of trachoma around Omaha, in the Indians and others. A squaw will come in with her husband, and he

does not have trachoma and the children do not have trachoma, but she has had it for many years. Dr. Gifford once squirted some trachomatous material into one of his own eyes and promptly developed a pannus, which it took two years to get rid of. We always have a crop of it after the threshing season. There is a form of conjunctivitis with a very profuse growth of granules, but it is not trachoma at all.

I. W. Haughey, Aurora, Nebraska. It may be that there are two or three agents producing similar symptoms, all of these resulting cases being classified as trachoma. In my own cases I usually find trachoma in the other members of the family of a patient who has had the disease. It was reported from Lincoln, Nebraska, that fifty to ninety per cent of the school children had trachoma. They were probably reporting, as trachoma, cases similar to what I got in my own practice, which get well readily on scraping and the use of copper sulphat. They may be trachoma or they may not, but if not I do not know what to call them.

L. H. Buxton (closing). My stereotyped method of treating ordinary cases of trachoma is: first expression, crushing the large majority of the granules, destroying the trachoma bodies, but remembering that you can not do this in one application; the patient must be in my office every day; the first day after expression I scrape the lids thoroly with gauze, and each day after that; in the meantime if there is any necessity for using the forceps again I do it; and the patient does not have irritated eyes. Under this treatment you will find that the pannus is getting better, the lids getting thinner. The strange thing about copper, used right along, is that the second month is painless. I give it to the old Indians and if they follow instructions and rub their lids every day they can cure their trachoma.

Growths on Inner Surface of Each Eyelid.

ROBERT FAGIN, Memphis, presented a patient, the report of whose case will

be published subsequently. The microscopic examination of a piece of the tissue was reported by Dr. Finnoff.

W. C. Finnoff, Denver. The sections from the tumors consist almost entirely of small round cells which resemble lymphocytes. The arrangement of the cells is similar to that of the germinating centers of lymph nodes. A few fibroblasts are present. They send out fine reticular strands which support some of the cells. The remainder of the cells are held together by a delicate intracellular cement substance. Several capillaries, which are made up of a single layer of endothelial cells, are seen thruout the tumor. There is a small triangular strip of stratified conjunctival epithelium in one corner of the section. The tumor cells invade the whole subepithelial tissue.

From the location of the tumors and the microscopic appearance of the sections, I would classify the tumors as lymphomas.

DISCUSSION.—Arnold Knapp. The condition would probably react unusually well to the X-ray and radium. The cells are exceptionally young in character, and I would suggest the application of the X-ray.

Edward Jackson, Denver. The first thing I thought of was hyalin changes in the lid, but the lids are free from scarring; and on seeing the sections there can be apparently no question as to its nature. I believe it would be a good case for radium in rather large doses, say from thirty to fifty millicuries. I think this is more promising than internal treatment with arsenic.

Melville Black, Denver. Outside of radium, the only thing that occurs to me would be the fulguration spark, which could be easily applied. If the application of these two agents does not produce results I should be in favor of letting the case alone.

E. R. Neeper, Colorado Springs. My experience with the use of the fulguration spark on isolated nodules of vernal conjunctivitis, was that the result was an increase rather than a decrease in the size of the nodules.

Hypotony After Trephining.

ARNOLD KNAPP, New York City, read the paper published in full, page 88.

DISCUSSION.—Edward Jackson, Denver. My experience in trephining has been very limited. I have had no case that remained below ten millimeters for more than a few weeks. The nearest approach to anything of this kind was in the first eyeball I trephined, where the tension remained below twelve millimeters for several weeks and was below fifteen millimeters after eight years. In that case there has been no marked deterioration of the eye. It was a blind eye in the first place, a case of simple glaucoma. The most rational explanation of postoperative iritis has seemed to be that it was the result of prolonged reduction of intraocular pressure. And yet the tension in such cases was often not so low as that of my case. It is probably well that we have a method by which the tension of the eye can be permanently reduced below normal in glaucoma, because I believe the changes in glaucoma are due to a change in relation of tension to nutritive processes, rather than absolute increase in tension. We have cases of glaucoma in which the deterioration goes on while the tension is down at the normal level.

Melville Black, Denver. Does Dr. Knapp feel that the trephine opening in each of his cases was as far forward as he would have liked to have it? The posterior position of the opening seems a possible explanation of the persistent hypotony. Is the detachment of the choroid a thing that may occur and be only temporary? I have never personally seen a case of persistent hypotony. The tendency in all of my cases has been either to normal tension or to moderate increase in tension. It has seemed to me that in all the trephine failures I have had the opening was not far enough forward on the cornea.

Robert Fagin, Memphis, Tennessee. Will Dr. Knapp tell us his experience with the Lagrange operation, and whether he has had this hypotony after the Lagrange operation?

Dr. Knapp (closing). I think the question of hypotony and the intro-ocular circulation is a very important phase of our study of the subject. Personally I look upon a case with an enormously large ectatic scar and minus tension with a good deal of trepidation. I do not think that choroidal detachment has anything to do with prolonged softness of these eyes. I think you will find choroidal detachment present in the majority of these cases. I have never seen a choroidal detachment remain permanent. In trying to get a complete iridectomy in these cases I may make too much traction on the iris. As to the position of the trephine opening, Collins has shown that the success of the filtration depends upon making a complete cut in Descemet's membrane. I am further very careful to separate the superficial layers of the conjunctiva from the cornea. I have never got hypotony from a Lagrange, in fact rather a hypertony than a hypotony. I limit the Lagrange operation to cases which I get early, in which by the use of drops I can get the tension below thirty millimeters, and in which the iris is not degenerated.

WM. H. CRISP,
Recording Secretary.

SECTION ON OPHTHALMOLOGY, COLLEGE OF PHYSICIANS OF PHILADELPHIA

November 20, 1919.

DR. WILLIAM T. SHOEMAKER,

CHAIRMAN.

Operation for Draining Lacrimal Sac and Nasal Duct into the Unciform Fossa.

DR. HARRIS P. MOSHER, of Boston, read by invitation a paper describing the operation devised by him for this purpose, with a review of the anatomy of the parts involved. (See LARYNGOSCOPE, v. 25, p. 739.)

DISCUSSION. Dr. S. Lewis Ziegler said that the ingenuity and practicability of Dr. Mosher's operation should receive our commendation. There is no doubt