degrees. With the radius 7.6 cm., the paracentral region may be mapped including the blind spot of Mariotte and down to about 8 degrees. By making the long tube 1 meter the field can be mapped to five degrees.

A still simpler instrument, which I have made, has a strong steel rod 3/16 inch diameter instead of the tube, but it has the disadvantage that there is not sufficient room for marking the degrees, except by marks which have to be counted. When an eye has insufficient central vision to see thru the tube the sighting may be at the end of

the tube or along the top of it, which will give only a negligible error.

My limited use of these instruments indicates that fields may be much more rapidly and completely mapped than with other instruments with which I am acquainted, and with decidedly more ease and comfort for both patient and surgeon.

The accompanying charts show the results of measurements of the blind spot of a patient of Dr. Charles Nelson Spratt by the Peter campimeter, the Brown scotoma map and this new instrument.

SOCIETY PROCEEDINGS

Reports for this department should be sent at the earliest date practicable to Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Illinois. These reports should present briefly the important scientific papers and discussions.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

May 15, 1922.

Dr. E. K. FINDLAY presided.

Prof. Ernst Fuchs of Vienna was the guest of honor.

Ectropion of Left Lower Lid.

Dr. MICHAEL GOLDENBURG presented a man, aged 87, who came to the hospital on October 28, 1921, with an ectropion of the left lower lid, due to a complete paralysis of the left facial. In view of the age of the patient it was thought advisable, in order to save the eyeball, to stitch the lids together.

At the time of presentation the facial paralysis was much improved, and it was thought that the lids would be separated a little more toward the inner canthus to permit the patient to see a little better. Diagnosis by a neurologist was hemorrhage into the internal capsule.

Sarcoma of Eye.

Dr. GOLDENBURG then presented a woman, aged 34, a housewife, married 15 years, who had five children, all living, no miscarriages. She first noticed a protruding of the right eye last November. It had progressively become worse, but she stated that it was somewhat improved in the last few

days. At onset she had severe headache, involving the area around the right eye. This pain was accompanied by weakness. Examination showed the right eye protruding forward and outward, and could not be replaced. Left eye negative. Vision, right eye 15/200. Vision, left eye 15/20 minus 2. Right and left pupil reacted to light and accommodation.

Fundus: Right media clear. Temporal side of disc could be defined. Nasal side tilted forward and lost in surrounding tissue. Some tortuosity of vessels, particularly on nasal side, as if there were some bulging on that side involving the whole eyeball. A vertical wrinkling of the retina was noticed. No hemorrhages visible. Left, media negative. Disc fairly well defined, shallow saucer cup. Vessels, retina and macula negative. Right antrum was irrigated with difficulty, but no discharge was found. Nasal examination disclosed septum slightly deviated to the left. Inferior turbinate normal. Middle turbinate pressed against septum. Upper part of nasal vault pretty well closed up. Slight discharge from right middle meatus. Blood Wassermann negative. Radiogram showed a complete blocking of the right antrum, right ethmoid and right frontal sinus. The rim of the

right orbit in the region of the frontal sinuses and the ethmoids showed a marked destruction. This condition was evident in the anteroposterior view and in the perpendicular view. The lateral view showed a marked apical abscess involving the superior right first and second molars. An attempt was made to irrigate the right antrum, but when the trocar was introduced no water could be forced in until the trocar was partially withdrawn, indicating that some part of the antrum was filled. The suspicion based on radiographic findings was that it was a sarcoma.

Coloboma of the Macula.

DR. A. P. HUNNEMAN presented a boy who came into the hospital because of poor vision. During the routine examination, the interesting condition was found and diagnosed as a coloboma of the macula. The term "coloboma of the macula," however, should only be used in a topographic sense, to indicate a partial atypic coloboma of the retina and choroid, since the macula is not developed in the fetal cleft. These colobomata are supposed not to be hereditary but may be congenital.

These cases were rare, and might be mistaken for choroidal changes. About 46 cases had been recorded up to 1916. Usually the horizontal oval diameter was 1 to 10 disc diameter. There was generally some ectasia, 1 to 6 D., maximum 10 D. The edges were usually sharp and showed a line of pigment. There was often a yellowish zone outside. The surfaces might show patches of pigment. Where coloboma was unpigmented it had a pearly glistening color. As in other colobomata, there were retinal and ciliary vessels. Large branches of the ciliary vessels might emerge from the floor. Coincident anomalies were rare.

The refractive error in this case was myopia. Vision of the right or affected eye was 18/200 and of the left 20/20 with correction. The size of the coloboma was about 4 and 3 disc diameters, with an ectasia of 6 D., and was slightly pigmented on the nasal side.

Uveitis, Bullous Keratitis, Hypertension.

DR. T. D. ALLEN presented a young lady, referred to him in November, 1921, with a history of pain in the right eye extending over a period of eleven months. Examination showed the right pupil widely dilated (atropin). Vision, hand movements, and at times fingers at a few feet. The cornea was steamy, particularly the lower half, and a large bulla could be seen on it. The anterior chamber was quite deep, and there were spots on the posterior surface of the cornea. There was slight edema of the conjunctiva. Tension was considerably increased to the fingers. The use of eserine reduced the tension to a marked degree. The fundus could not be clearly seen.

The following day the bulla on the cornea had completely disappeared; the tension was 60 mm. of mercury, whereas in the left eye it was 24 mm.; eserine was again used and the tension came down. A diagnosis of uveitis with bullous keratitis and hypertension was made. The patient was sent to the hospital where careful general examination revealed no gross abnormality. The sinuses were investigated, the ethmoids and sphenoids on one side completely cleaned out, and the tonsils cleanly removed without relief. Teeth negative, and tuberculin tests negative.

Finally, a paracentesis was done, with relief for about one week; when the tension again went up and remained high, in spite of miotics or mydriatics. After further study it was decided to give some foreign protein intravenously. This gave immediate relief. The first dose, which gave a chill and temperature of 102°, reduced the tension; the eye became white for the first time in months and all subjective symptoms were relieved. There was a relapse, so the dose was repeated, and in all seven injections of typhoid vaccine were given.

The patient then left the hospital and was watched at home for a time, but the condition recurred. Owing to the history of pus tubes after marriage some ten years before, she was put on g. c. vaccine, but as there was no sys-

temic effect after increasing the dose to 4,000,000,000 it was discontinued and another dose of typhoid vaccine was given. This caused a marked reaction, and since that time there had been no return of tension, the eye had remained white, there had been no subjective symptoms, the patient had felt better and gained weight. The bullae on the cornea, tho smaller, had continued to form about once a week.

Soon after performing the paracentesis, all of the epithelium was removed from the lower two-thirds of the cornea. The membrane of Bowman was scraped and iodine applied. Three days later a bulla appeared on that place. At presentation the vision was 20/50 in the right eye, and there was a small organized exudate in the posterior chamber at 6 o'clock, which was visible with the naked eye when the pupil was dilated. There were also still many deposits all over the posterior surface of the cornea. The left eye had been perfectly normal at all times.

Discussion. PROFESSOR ERNST FUCHS, of Vienna, believed that in this case, if the cornea was scraped and the vesicle examined, a fine new membrane would be found under the epithelium. The steaminess of the cornea, in an attack of glaucoma, acute or chronic, was due to the accumulation of droplets between the deeper layers of the epithelium, due to the high tension. If the tension dropped, the steaminess might disappear within 1/2 hour to an hour, as these droplets were absorbed. In cases of long standing, these droplets coalesced and formed large accumulations of liquid beneath a new-formed thin connective tissue membrane, lying between the epithelium and Bowman's membrane. Bowman's membrane was perfectly smooth, and it was easy to understand that such a membrane superimposed on it was not firmly attached and could be easily detached by the accumulation of fluid. On attempting to remove the vesicles by scraping, a great part of the epithelium could be removed, sometimes almost the entire epithelium, which could not be done with a normal epithelium. Microscopic examination showed a fine membrane connected

with the epithelium. He had removed the vesicles and touched the exposed corneal stroma with iodine and knew of nothing better. This had to be repeated in some cases.

Melanotic Epibulbar Tumor.

DR. WILLIAM H. WILDER presented a young unmarried woman with a melanotic growth on the temporal side of the left eye, which was visible even at a distance. This growth appeared about eight years ago, beginning near the temporal limbus. It gradually increased in size, became slightly elevated and encroached on the corneal limbus. She was seen two years ago, and the diagnosis of melanotic sarcoma was made, and the customary treatment of enucleation advised. The patient had never had any pain, the vision was normal, and there was no sign of disturbance inside the eye, so the patient refused to accept either the diagnosis or treatment.

Radium therapy was instituted and she had received thirty or forty applications of 100 mgs. radium for as much as fifteen minutes at a time. For a time this seemed helpful, and a peculiar change had taken place. Evidently from the effect of the radium, the pigmented cells had been dispersed and could be seen scattered over the conjunctiva. The growth had not decreased, but was extending and encroaching more and more onto the cornea. Dr. Von Der Heydt had examined the eye with the slit lamp, but could find no evidence of new pigmentation in the interior of the eye.

The case was interesting because of its chronicity. Melanotic sarcomata usually grew rapidly, but this growth had existed for years. Dr. Wilder wondered if they might be mistaken as to the exact nature of the growth, and whether it might be a *pigmented epithelioma*. These were rare, but did exist. This surmise had been strengthened by Dr. de Schweinitz, who saw the case and thought because of the chronicity it might be this type of growth.

The patient disliked to part with an eye that had normal vision, but he

believed a radical enucleation was indicated.

Discussion. PROFESSOR FUCHS thought this was a most extraordinary and interesting case from several points of view. First, as to its nature, whether it was sarcoma or carcinoma. Because of the pigmentation it looked like a sarcoma, while the flat, superficial growth on the cornea resembled a carcinoma. The principal question was whether it might be a pigmented carcinoma, but he is doubtful of the existence of a real melanotic carcinoma. They had often been described, but he had never seen one that he was satisfied should have that diagnosis. In the cystic carcinomas, it was found that they usually started from a nevus on the limbus, being therefore of mesodermic tissue. He did not believe these were actually epitheliomas, but that they were really sarcomas, because when they grew they developed into regular sarcomas, altho they looked like carcinomas in the beginning.

Another interesting feature of this case was the scattering of the pigment around the tumor. There was a well circumscribed tumor, but for a distance nearly one centimeter away, the conjunctiva was filled with scattered pigment. He thought these were particles carried away from the main tumor, perhaps thru the lymph current, and perhaps by phagocytes. Such cases had been described, and he had seen one, in which after a blow on the eye there was a subconjunctival rupture of the sclera. The iris had become detached all around and had been expressed thru the wound under the conjunctiva. In those cases the pigment of the iris became free by necrosis of the iris and was scattered all over the eyeball, so that the whole white of the eye had become dark. He believed the appearance in this case was due to the same dissemination of pigment by lymph or phagocytes, probably because of the radium therapy. It had become free because of necrosis of the tissue of the tumor.

As to the treatment, he thought the safest plan would be to remove the eye, together with all of the conjunctiva containing pigment. The prognosis was

very different in sarcoma and epithelioma. If it was sarcoma there was great danger of metastasis. He knew of several cases in which after removal of a small sarcoma, or melanoma, of the limbus, the patient had succumbed within two years. As the patient did not want to part with the eye, the best thing would be to make an extirpation of the tumor, cauterize the surface with the galvanocautery and treat it afterward with radium and examine the excised tissue. If it proved to be sarcoma, the eyeball should be removed at once. If it was carcinoma it was not so dangerous, altho there might be local recurrence. He did not know whether there was a history of nevus in this case or not.

(Dr. Wilder said that the patient reported a small pigmented spot on the cornea having existed before.)

DR. FUCHS said if that was the case the condition spoke in favor of a previous nevus, and it was now probably a melanotic sarcoma. This was much more likely as the patient was not of the carcinoma age.

DR. WILDER thought that while the pigmented epithelioma were very uncommon, probably every one who had done much pathologic work had seen some cases. He recalled one case with a sort of cauliflower growth, that developed in the limbus of the eye of a negro. He did not advance the view that the present case was of that nature, but had thought from the beginning that it was a melanotic sarcoma, particularly because of the firm, pigmented growth usually described, but the chronicity of the case made him doubt this. The woman had a very dark complexion and the irides were distinctly dark, which might account for the appearance. He was inclined to think the best measure was enucleation, but the patient had not yet consented.

With all due respect to Professor Fuchs, he would hesitate to make a section for the purpose of diagnosis. He had refrained from this, because in America we had been educated up to the belief that the less one meddled with a suspicious growth for the pur-

pose of a histologic examination, the better for the patient.

Nodular Keratitis.

DR. C. O. SCHNEIDER presented a case of a young woman, aged 36, with a rare and interesting corneal condition (nodular keratitis), which he had first seen three weeks before. She had been troubled with inflamed eyes as long as she could remember. Her mother told her this started following measles as a small child. One sister, now dead, had a similar trouble in the left eye. She thought the condition was progressing and vision was diminishing. Her vision at this time was R. 20/200 and L. 10/200. When she was first seen, there was also one small area on the cornea that was ulcerated and stained with fluorescein, but under treatment this cleared up and did not stain by the following week.

On the cornea of the left eye were six to eight elongated, irregular, white patches, each approximately two millimeters in length. The surface of these areas was quite rough, and they projected distinctly above the surface of the healthy cornea. The right eye also had a similar opaque area, ribbon shaped and extending over half way across the cornea. At presentation none of these areas stained.

A record of the same patient made ten years ago at the Infirmary had been found. The case was then diagnosed as keratitis eczematosa. The vision was R. 20/200; L. 8/200. The description of the lesions was much the same as the present findings, and the fact that the leucomas were elevated was also mentioned. There was then present redness, pain, photophobia and lachrimation, which, however, were not marked symptoms at the present time.

Discussion.—DR. HARRY GRADLE said this case was very reminiscent of a case shown by him some time ago. Dr. Jackson, of Denver, also saw the case. He called it keratitis marginalis vesiculosa. That patient showed much the same condition as this one, but in both eyes. On the cornea, about 1 mm. from the limbus, were small vesicles, which were elevated about one-half millimeter. These vesicles were filled with perfectly clear fluid. Upon

evacuating the vesicles, the corneal epithelium sank back and left an area which was very similar to those in this young woman's eyes. These were in a crescentic form over the entire limbus, so that the eye resembled the contour map of the foothills. The slit lamp threw no light on the case, and he had found no treatment of value, with the exception of possible thinning of the areas by dionin. In response to a question from Dr. Fuchs, Dr. Gradle stated that the lesion went deep, below Bowman's membrane, and the vesicle was composed only of epithelial cells.

PROFESSOR FUCHS thought this did not look like vesicle formation, but those who had seen the case, of course, knew more about it. He would have considered the case as related to the keratitis nodosa of Groenouw. In those cases, the elevations were not filled with fluid, but were solid. If one of the opacities would be removed for examination, he advised putting it first in glacial acetic acid and then staining it according to the Giemsa method. In this way the two substances contained between the corneal lamellæ were very well shown.

Progressive Opacity of Cornea.

DR. ROBERT H. BUCK presented a colored man, who stated that about eight months ago he noticed failing vision in his left eye. He had no pain, and the eye was only slightly reddened. A white spot appeared in the cornea, and this had been growing gradually larger while vision had been failing rapidly. Examination revealed vision of 20/200 in the right and no vision in the left eye. He had marked nystagmus, which had been present since childhood. The left cornea showed some opacity, and there was an amount of organized exudate in the anterior chamber, adherent to the lens. The iris was degenerated and the lens was opaque. Tension was very low. The condition was suggestive of intraocular tumor or a long continued iridocyclitis. Transillumination was unsuccessful.

Discussion.—PROFESSOR FUCHS said this was a very doubtful case, and he thought it was impossible to tell what

it might be. In regard to the transillumination, he had learned in this country that the eye of a really black negro could not be transilluminated.

In reply to a question Professor Fuchs said: That dystrophies were so extremely manifold and some of them so rare, that one man scarcely saw two cases alike, so that it was impossible to class them as a definite disease. It was hard to tell what was typical when one saw only single cases. Many of them were probably related to the keratitis of Groenouw, as the lattice keratitis and others, attacking often several members of the same family. There were other cases in which there was infiltration with fat or lime salts, and others in which the cause was unknown. In some cases it was said that the internal secretion was the cause, but there was no definite proof of this. Sometimes after a thyroidectomy opacity of the cornea followed. Similar cases had been observed in myxedema, but these cases were very rare and exceptional. It might be that in these cases some disturbance of internal secretions was the cause, but nothing definitely was known about this.

DR. ROBERT VON DER HEYDT asked Professor Fuchs if he had seen any of the corneal cases Haab had described as *buchstaben-keratitis* and considered as possibly tuberculous.

PROFESSOR FUCHS replied that he had seen a case, but it was not tuberculous. Some observers considered *keratitis nodosa* as tuberculous, but this was certainly wrong. He had examined some of the cases histologically and there was no trace of tuberculosis.

ROBERT VON DER HEYDT,
Corresponding Secretary.

SECTION ON OPHTHALMOLOGY, COLLEGE OF PHYSICIANS OF PHILADELPHIA.

March 16, 1922.

DR. MCCLUNEY RADCLIFFE, Chairman.
Unusual Type of Cataract.

DR. WARREN S. REESE (by invitation) exhibited a male patient, aged

29 years, with bilateral cataract. The lens presents a 5 mm. circular opacity, occupying the pupillary area, and in the anterior cortex, thru which a fair fundus glare is obtainable. In the center of this opacity are numerous other, perfectly opaque, nodular opacities. These extend almost to the periphery of the large circular opacity.

Discussion. — DR. WILLIAM ZENTMAYER said the type of cataract shown by Dr. Reese is probably that pictured by Bach and also by Collins, and described by the former as a case of lamellar and central cataract. The arrangement of the denser opacities in the center of the nucleus resembled somewhat that of coralliform cataract, but they have a waxy rather than a crystalline appearance. It is probable that these opacities within the zonular region are due to accumulation of granular matter in the lines of separation between the different layers of the lens—the so-called "lens star."

DR. BURTON CHANCE said that he was greatly interested in Dr. Reese's case by reason of the fact that he discovered that the young man had been under his own observation a number of years ago. Indeed, he was one of five in a family presenting in each eye, the same form of cataract. These disciform cataracts are known in the literature as the "Coppock," from the name of a family among which Nettleship and Ogilvie found seven generations so affected. Chance's cases were reported at the meeting of the Ophthalmological Society in 1907. None of the family has been seen by Chance since then, but he immediately recognized the man's eyes. He would only add, that so far as he is able to recall to his memory the unusually accurate drawings by Miss Washington, the cataracts have not changed in size or density, nor the eyes in their refraction. It is of additional interest to learn that the young man was accepted for military service in 1918.

Localized Cataract With Unusual Fundus Changes.

DR. WARREN S. REESE (by invitation) exhibited a male, aged 28 years. Three years ago he was struck in the