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FOUNDED BY JAMES PLEASANT PARKER

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THE ANNALS
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I.

AN INQUIRY INTO RESULTS OF THE ESTABLISHED TREATMENT OF DETACHMENT OF THE RETINA, AND A NEW THEORY.*

DERRICK T. VAIL, M. D.,

CINCINNATI.

On May 4, 1912, the following letter was sent to the addresses of 460 of those oculists from all the large cities of the United States whose names are recorded in the attendance list published in the "Transactions of the Ophthalmic Section of the American Medical Association, 1910":

Dr. ————————,

My Dear Doctor:

I have a case of detachment of the retina which has shown no improvement after three months' lay-up in a dark room, using pilocarpin and steam sweats, full doses of iodid of potassium, etc.

In over twenty years' experience as a practicing ophthalmologist, I have not seen a case of amotio retinæ permanently cured by any kind of treatment.

I write to ascertain if you have met with success in curing any case or cases of nontraumatic retinal detachment, and will

*Read at the annual meeting American Academy of Ophthalmology and Oto-Laryngology at Niagara Falls, Ontario, August 20-22, 1912.

be very grateful if you will answer the following questions:

(a) How many cases of nontraumatic detachment of the retina have you permanently "cured"?

(b) What was your treatment?

Thanking you for replying, I am,

Very sincerely yours,

D. T. Vail.

I received 281 replies. These I have compiled in alphabetical order. I intentionally asked only two short questions, so that men would not be put to much trouble in answering, but the answers I received were full and characterized by earnest frankness. Some took their time to write lengthy letters, recounting their experience. These I have compiled in the appendix.

I wish to thank all for the interest they have shown and for their valuable aid in proving the incurability of this dread disease of the eye by the established methods of treatment.

The following methods of treatment are mentioned in the 281 answers received:

Medical Treatment.—Local: Atropin, dionin; subconjunctival injections of salt solution, ranging from the "normal salt" to 20 per cent; subconjunctival injections of dionin up to 10 per cent: saccharinate of sodium and sugar.

General: Pilocarpin injections, kalii iodidi, bichlorid mercury, calomel, salts, sodium iodid, iron tonics, salicylates, purgatives, syr. hydriodic acid, pilocarpin infusions, fl. ext. jaborandi, thyroid extract and abortion.

Nursing: Dark room, rest in bed, steam sweats, low diet, dry diet, dorsal position, head depressed, electric baths, massage, tight bandage, hot packs, leeching, absolute rest, resignation.

Surgical: Scleral puncture, posterior sclerotomy, Graefe's needle punctures, puncture through sclera and retina at site of detachment and elsewhere, actual cautery, galvanocautery to sclera, electrolysis, galvanocautery paracentesis, deep scleral incisions, "T" shaped and plain, trephining of sclera, division of the retina, silver wire drainage, gold thread drainage, excising a piece of sclera in the ciliary region, Dentschmann's operations, consisting of frequent scleral punctures, "Durchschneidungen," withdrawing subretinal exudate and injecting normal salt solution in the vitreous chamber, etc.

What are the results? Two hundred and fifty of the total two hundred and eighty-one never cured a single case! Many have had promising temporary results, but in the end, failures. Here are some of the comments:

No. 11—Never saw any permanent results.
No. 13—Temporary improvement.
No. 17—Always wished I had used some other treatment.
No. 25—Temporary marked benefit, but no cure.
No. 27—Flattering prospects; ultimate failures.
No. 29—Never obtained satisfaction from any kind of treatment.
No. 30—Repeated failures.
No. 33—Never saw a permanent cure.
No. 34—Never saw a case cured.
No. 35—Cannot recall a case cured.
No. 38—Separation returned.
No. 43—Never saw a cure.
No. 44—No success.
No. 47—Same as yours.
No. 48—Hope unsustained.
No. 54—Results utterly disheartening.
No. 58—Partial relief, but not permanent.
No. 61—No confidence in any proposed treatment.
No. 62—Did not feel encouraged to try any special treatment.
No. 65—Have punctured sclera in several without benefit.
No. 80—Have had no results from rest and diaphoresis.
No. 89—Do not think it is curable.
No. 94—No real improvement.
No. 95—Temporary reattachment; ultimate failure
No. 104—Usual methods of treatment used without success.
No. 105—Temporary improvement only.
No. 106—I think the treatment had nothing to do with the improvement.
No 121—Have never seen a detachment cured.
No. 124—Have never witnessed a cure.
No. 126—None benefited by any treatment.
No. 128—Have never seen any permanent results from any form of treatment.
No. 129—Have tried salt injections without avail.

No. 130—Results are not commensurate with time and labor spent.

No. 131—No case would submit to treatment after prospects were explained.

No. 137—Improvement for a short time.

No. 147—I consider detachment of retina a hopeless condition.

No. 149—Invariably a return to detached condition.

No. 152—No positive results with any form of treatment.

No. 153—Rest and let alone—all else is charlatanism.

No. 154—Not even temporary improvement.

No. 160—Went on from bad to worse.

No. 174—Often temporary improvement, but none permanent.

No. 185—Never saw permanent improvement effected.

No. 189—Have seen improvement last a few days.

No. 198—Reattachment followed by spontaneous complete detachment.

No. 206—Have tried everything from k. i. to Deutschmann—result nil.

No. 211—Only cases I have seen cured did not have detachment.

No. 213—Promptly tell my patients their condition is practically hopeless.

No. 223—Forty years' experience—no cures.

No. 226—The only case I ever cured refused all treatment.

No. 227—Error in diagnosis may account for the reported cures.

No. 237—Saw a case cured by Deutschmann who went nearly blind afterward.

No. 238—We read of cures, but do not see them.

No. 242—I shall not promise great results from my experience.

No. 245—Forty-two years of experience—no cures.

No. 246—The reattached cases promptly relapsed after getting up.

No. 253—I give such a poor prognosis patients will not stay.

No. 258—Believe no treatment of any service except in recent cases.

No. 266—Twenty-five years' experience in a large practice—no cures

No. 270—Consider condition incurable and tell patients so.
No. 279—Knows of spontaneous cure.

There are 250 oculists of renown practicing in the largest cities of the United States, representing on an average twenty years of practice and an experience averaging five cases a year, or about 25,000 cases in all, with the employment of every known line of treatment, as No. 206 says, "from k. i. to Deutschmann," and not a single case of permanent cure in the lot. On the other hand, we have thirty-one oculists who have met with cures. Twenty-five met with a single cure each, four met with two cures, and two met with four cures, making in all forty-one cases reported cured. Two of these cases had detachment due to albuminuria in pregnancy, and they were cured after abortion—they should not be counted, as the treatment is not applicable except in these unusual circumstances. This leaves thirty-nine cures. In about half this number, the "cure" is not convincing from the records submitted, leaving say twenty cases, or less than one cure in every 1000 cases!

In the light of such overwhelming defeat in our attempt to cure this disease, and after having used the knife to puncture and transfix, the cautery to burn holes, the scissors to cut windows, the confinement in a dungeon of darkness with dry diet, purges and sweats, the k. i. and tight bandage, and after all and everything has been tried to have the prospect of cure reduced to less than one out of 1000 cases, I say the treatment is barbarous and even brutal. What else can we say of such fiendish treatment?

Gentlemen, I apologize for using such strong language, and now beg to present the evidence from these 281 eminent witnesses, to show that we are not really justified in resorting to anything but the mildest and most humane measures in the treatment of detachment of the retina until we have a "cure" that cures.

(Here follows the report from circular letters.)

1—Albro, M. Z., Chicago. (a) None.

2—Alt, Adolf, St. Louis. (a) One, age 18. (b) "Myopic detachment since September, 1883. Pilocarpin injections, rest, brought on menses after collapse, retina reapplied after five days and has remained so ever since."

3—Alter, Francis, Toledo. (a) None. (b) "Rest in dark

room, pilocarpin sweats, k. i., mercurials, especially calomel, to keep the bowels wide open, follow with customary use of salts."

4—Appleman, L. F., Philadelphia. (a) None. (b) "Sweats, mercury and iodids, eliminative treatment."

5—Ayres, S. C., Cincinnati. (a) Two. (b) "Rest in darkened room, vapor baths, pilocarpin, k. i., low diet, one recovered, detachment replaced, but relapsed soon."

6—Baer, B. F., Jr., Philadelphia. (a) One (1904). (b) "Rest in bed, atropin, pilocarpin sweats every other day, pressure bandage, subconjunctival salt injection, sod. iodid, patient last seen 12-11-1911, with vis. 6/9+. This case was one of preceding hyalitis and myopia of 4 D."

7—Barck, Carl, St. Louis. (a) None. (b) "Usual medical, etc., operative procedures according to Deutschmann."

8—Beaudoux, H. A., St. Paul. (a) None. (b) "Same as yours. Improved two permanently as far as I know; by that I mean partial reattachment with improved vision."

9—Beard, Chas. H., Chicago. (a) None. (b) "Chiefly medical, about as outlined by you in your letter."

10—Beil, J. W., Kansas City. (a) None. (b) "Same as you have used."

11—Bennett, A. G., Buffalo. (a) None. (b) "Sweats, dionin, rest in bed, tapping. I never saw any permanent results, either in my cases or cases I have seen treated by my colleagues."

12—Behrman, Isadore, Washington, D. C. (a) One. (b) "Unmarried lady, aged 65. Was kept flat on her back seven weeks, eye bandaged with slight pressure with woolen bandage every day by myself. Iron tonics, bowels regulated; result perfect for fifteen years."

13—Bishop, C. Wesley, Minneapolis. (a) None. (b) "Same as yours, scleral puncture in addition, temporary improvement in several cases."

14—Black, Melville, Denver. (a) None. (b) "On back in bed, pilocarpin sweats, scleral puncture, subconjunctival injections of solutions of salt, saccharinate of sodium, etc."

15—Blair, Wm. W. Pittsburg. (a) None. (b) "Rest in bed, dionin, normal salt solution (subconjunctivally) and scleral puncture."

16—Blakesley, T. S., Kansas City. (a) None.

17—Bonner, Horace, Dayton. (a) None. (b) "No matter

what treatment I used I always wished I had used some other one."

18—Bordley, James, Jr., Philadelphia. (a) None. (b) "I remember once, years ago, seeing a case with Dr. Theobald, which, under constant use of pilocarpin, apparently made a complete recovery. This case he reported, I believe, at Utrecht."

19—Bosse, Edwin, H., St. Louis. (a) None. (b) "Salicylate of soda and sweats, pilocarpin and sweats, rest in bed. In two cases punctured sclera without results.

20—Bossidy, John C., Boston. (a) None. (b) "Pilocarpin or scleral puncture."

21—Bowers, John W., Portland, Me. (a) None. (b) "I have always considered detachment as mechanical, even in high myopia."

22—Brinckerhoff, G. Edwin, Oakland. (a) None. (b) "I have tried all the usual methods of treatment. One case I recall that after we had given up, the patient went about groping his way and finally his vision improved very considerably."

23—Broughton, Wm. R., New York. (a) None. (b) "One partially cured, 20/100 vision; treatment same as outlined."

24—Brown, Earl J., Chicago. (a) None. (b) "Rest in bed, sweats, subconjunctival injections, dionin (actual cautery in one case)."

25—Brown, Edward J., Minneapolis. (a) None. (b) "Have seen temporary marked benefit from treatment you mention, but no cures."

26—Brown, E. V. L., Chicago. (a) None. (b) "Rest in bed; have punctured sclera. The Fuchs clinic was 'up against' this same failure."

27—Brown, H. H., Chicago. (a) None. (b) "Have had some flattering prospects, but the ultimate results have been failures."

28—Brown, Samuel H., Philadelphia. (a) None. (b) "Rest in bed for one or two months, sweating, purgation, k. i. as ordinarily advised."

29—Bulson, A. E. Jr., Ft. Wayne. (a) None. (b) "I have never yet seen one that obtained any very satisfactory improvement from any kind of treatment adopted."

30—Burck, Frank E., St. Paul. (a) None. (b) "Exactly same as yours, have tried this repeatedly."

31—Butler, W. K., Washington, D. C. (a) None. (b) "Have tried rest in bed, subconjunctival salt injections, alteratives, sweats, without avail."

32—Calhoun, F. P., Atlanta. (a) One. (b) "Rest in bed, pilocarpin sweats, syr. hydriodic acid."

33—Callan, Peter A., New York. (a) None. (b) "I have never seen a permanent cure. I have had temporary improvement. The late Dr. Henry D. Noyes in his work stated that he had four spontaneous cures."

34—Carpenter, John T., Philadelphia. (a) None. (b) "In more than twenty years' practice I have never seen a case cured."

35—Carroll, J. J., Baltimore. (a) None. (b) "I cannot recall any case of nontraumatic detachment of the retina permanently cured; i. e., return to normal both as to central and peripheral vision."

36—Chamberlin, J. W., St. Paul. (a) None. (b) "The regular routine, but with varying and temporary improvement."

37—Chance, Burton, Philadelphia. (a) None. (b) "One did well by methods you detail with paracentesis, but, alas! missing her way in the dark hallway, the lady fell down a long flight of steps (about two years later) with effect of total convoluted detachment resulting."

38—Chandler, H. B., Boston. (a) None. (b) "Several showed temporary improvement. Even when scleral puncture was performed, separation returned."

39—Cheney, Frederick, Boston. (a) None. (b) "Rest in bed and scleral puncture. It has seemed to me that in a certain number of cases, the separation has been nonprogressive for a much longer time than was to be expected, as a result of scleral puncture." (Refers to two cases cured by E. K. Ellis (*vide infr.*) reported in *Knapp's Archives*, 1909, No. 3.)

40—Charles, J. W., St. Louis. (a) None. (b) "As outlined."

41—Cohen, Lee, Baltimore. (a) None. (b) "Rest in bed, sweating, iodids, etc."

42—Coleman, W. F., Chicago. (a) None. (b) "In one with high myopia, a double galvanocautery puncture restored vision in forty-eight hours and retina was reattached, relapse, double puncture, improvement, relapse and cataract occurred

a year later." (Refers to the success reported by Stillson by double galvanocautery puncture.)

43—Connor, Ray, Detroit. (a) None. (b) "Have never seen one permanently cured."

44—Coover, D. H., Denver. (a) None. (b) "Same as yours and tapping through the sclera, but no success."

45—Claiborne, J. H., New York. (a) None. (b) "Rest, atropin, pilocarpin and resignation."

46—Clapp, C. A., Baltimore. (a) None. (b) "Sweats, rest in bed, and at times k. i."

47—Clark, C. F., Columbus, O. (a) None. (b) "My experience has practically coincided with your own."

48—Croskey, John W., Philadelphia. (a) None. (b) "Active mercurials, salicylates, iodids, pilocarpin, dorsal position, pressure bandage, scleral puncture followed by injection of salt solution in the vitreous chamber in hopes that retina might reattach."

49—Cross, F. B., Cincinnati. (a) None. (b) "The routine, rest in bed, etc."

50—Curdy, R. J., Kansas City. (a) None. (b) "Pilocarpin sweats, rest in bed, posterior sclerotomy."

51—Curry, G. E., Pittsburg. (a) None. (b) "Rest in bed, compress bandage, pilocarpin, k. i., mercurials."

52—Darling, C. G., ————. (a) None.

53—Davis, A. E., New York. (a) One. (b) "Scleral puncture, rest in bed for three weeks, atropin, bandaging; patient, a man aged fifty-five, had been seen six months before when vision = 20/20 with + 1.25 D., fundus normal, detachment in lower half, cause unknown. Complete reattachment and restoration of visual field. Observed for a year—no relapse, patient disappeared.

54—Dean, L. W., Iowa City. (a) None. (b) "Have tried every medical and surgical procedure that I have found recounted for amotio retinæ. My results utterly disheartening. Have wondered how it was possible for others to have secured the favorable results they have reported."

55—Defour, C. R., Washington, D. C. (a) None. (b) "Same as you have stated."

56—Derby, Geo. S., Boston. (a) None.

57—Derby, Hasket, Boston. (a) None. (b) "Same as your own."

58—Dixon, L. S., Boston. (a) None. (b) "I have sometimes obtained partial relief, but not permanent; could not call them 'cures'."

59—Dodd, Oscar, Chicago. (a) One. (b) "Others permanently improved. Deutschmann's operation repeated once in the cured case, with rest in bed, bandage. Have never seen any permanent benefit from any other treatment and have tried about everything." (See Discussion, Dodd's paper, 1910 meeting American Medical Association.)

60—Dowling, Oscar, Shreveport, La. (a) None. (b) "Rest, pilocarpin, etc."

61—Duane, Alexander, New York. (a) None. (b) "Rest, subconjunctival injections, pilocarpin (neither of these last two, however, in any thoroughgoing way, since they were badly borne). I did not have confidence enough in the various measures that have been proposed to try them."

62—Dudley, Wm. H., Los Angeles. (a) None. (b) "Most of my cases came in an advanced stage and I did not feel encouraged to try any special treatment."

63—Dye, Hobart, Washington, D. C. (a) None.

64—Ehrhardt, R. T., St. Louis. (a) None (?) (b) "Recumbent position with rest and nature must readhere the retina or it remains detached."

65—Ellett, E. C., Memphis. (a) None. (b) "Have treated about a dozen cases with rest, k. i., and pilocarpin. In one of these the retina reattached after I gave up treatment, but vision remained poor, 6/200. Have punctured the sclera in several, and all without benefit." (For report on interesting case, see Ellett's letter in Appendix of this article.)

66—Ellis, Bert H., Los Angeles. (a) None. (b) "Rest, dark room, pilocarpin sweats, k. i. to limit, dionin locally. The dionin has given me more and better results than anything else, but they have not been permanent."

67—Ellis, E. K., Boston. (a) Two. (b) "I am sending reprint containing history of these two cases (*Knapp's Archives*, Vol. XXXVIII, No. 3, 1909). I have seen both cases recently and after six and five years respectively, both retain the vision as given in the reprint. I have followed the same method in at least twenty others with no particular benefit, but I feel it is worth trying." (Note.—The first cured had vision equal to counting fingers at five feet, was put through heroic

treatment with bandage, scleral puncture, etc., and frequent subconjunctival injections of strong salt solution 5 to 20 per cent, sometimes twice a day. Ultimate vision 20/40. The second case came with vision 10/200; same plan of treatment except that instead of salt solution, 5 per cent dionin was used subconjunctivally three times. Recovery, relapse, recovery final and 20/30 vision.)

68—Ewing, A. E. St. Louis. (a) None.

69—Faith, Thos., Chicago. (a) None. (b) "Rest in bed, pilocarpin, saline catharsis, subconjunctival injections salt solution and dionin, internal administration of k. i. Deutschmann's operation repeated three times in two cases."

70—Farrell, P. J. H., Chicago. (a) None. (b) "Dark room, sclerotomy, all the various and many therapeutic agents advised."

71—Fisher, Wm. A., Chicago. (a) None. (b) "Bed for six weeks, draw off fluid, eliminatives, pilocarpin, k. i., inunctions, atropin, subconjunctival injections of salt solution, dionin. Have the nurse read Darier on treatment of detachment of the retina for encouragement."

72—Fiske, Geo. F., Chicago (a) Two. (b) "Two cures in thirty years. Treatment like your own, not cured by me, but peculiar cases."

73—Fleming, G. A., Baltimore. (a) None. (b) "Rest and alterations with sweats."

74—Fox, L. Webster, Philadelphia. (a) None. (b) "Sclera is punctured with broad needle to allow subretinal fluid to escape. I puncture every third day until ten punctures have been made. Every other day an electric bath to produce profuse sweating." (Fox refers to article of Bettremieux on sclerotomy. See *Ophthalmology*, July, 1912.)

75—Francis, Chas. H., Chicago. (a) None. (b) "Pilocarpin and other sweats, k. i., subconjunctival injections, dionin, rest in bed, bandage, scleral puncture."

76—Francis, L. M., Buffalo. (a) One. (b) "Detachment in case of six months' pregnant woman with edema and eclamptic symptoms. Uterus was emptied, patient given baths and eliminatives. Second day after abortion retina was replaced and has remained so ever since."

77—Frank, Mortimer, Chicago. (a) One. (b) "Established treatments. This case is now five years' standing, vision 6/9."

78—Franklin, Clarence P., Philadelphia. (a) None. (b) "The usual treatment."

79—Fridenberg, Percy, New York. (a) None. (b) "One or two improved; usual treatment, dry diet, subconjunctival injections of salt and sugar, which were painful and of no use. Pressure bandage seemed to do well in a number of cases."

80—Fridenwald, H., Baltimore. (a) None. (b) "Puncture of sclera has given me one case of permanent reapplication of the retina (without restoration of vision). Have had no results from rest and diaphoresis."

81—Frost, John R., Philadelphia. (a) None. (b) "Same as yours. There seems to be nothing which promises better."

82—Gamble, Wm. E., Chicago. (a) None. (b) "I have seen a few that seemed temporarily 'cured'."

83—Gardiner, E. J., Chicago. (a) None.

84—Getty, Mary, Philadelphia. (a) None.

85—Gifford, H., Omaha. (a) None. (b) "One case seemed to be cured by scleral puncture, but it may have been traumatic and was not followed for more than a year."

86—Gilbert, F. Y., Portland Me. (a) None. (b) "Rest (absolute), light diet, pilocarpin, etc."

87—Gildersleeve, C. C., Woodstock. (a) None.

88—Gill, M. H., Hartford. (a) None. (b) "Treatment as you have indicated; without success."

89—Goldberg, H. G., Philadelphia. (a) None. (b) "I do not think it is curable."

90—Goldenberg, M., Chicago. (a) None. (b) "Sweats, purgation, recumbent position, tonics, posterior sclerotomy, etc., etc."

91—Gosney, Chas. W., Kansas City. (a) None.

92—Goux, L. J., Detroit. (a) None. (b) "Rest in bed and same as yours excepting steam sweats."

93—Gradle, H., Chicago. (a) None. (b) "Rest will sometimes do it; if not, operative treatment." (Gradle refers to Elschnig's operation of excising a crescentic patch of sclera in the ciliary region, which he has seen yield qualitative vision where only quantitative vision formerly existed.)

94—Graef, Chas., New York. (a) None. (b) "Have tried the plan outlined for over two months faithfully at a stretch in two cases. No real improvement. Have tried same over shorter periods with no better results."

95—Green, John, Jr., St. Louis. (a) None. (b) "In several, temporary reattachment followed prolonged recumbent posture, sweats and k. i. Have never resorted to surgical methods."

96—Greene, D. W., Dayton. (a) One. (b) Patient operated on by Greene fourteen years ago for detached retina. Case recently examined by Van Note, of Lima, Ohio, who states the following: "Ophthalmoscopic examination reveals the retina reattached and a linear scar extending from the disc laterally on either side. The lower half of fundus is dotted with small round deposits of pigment, as in disseminated chorioretinitis."

97—Greenwood, Allen, Boston. (a) One. (b) "Dark room, bandage and subconjunctival salt solution injections. Complete reattachment, lasting now seven years. Whole lower half of retina was detached; myopia 6 D.; full visual field, but very narrow; linear scotoma where retina folded. This field shows as a white line horizontally across fundus with a break at the disc." (Greenwood refers to the two cases cured by E. K. Ellis—see above.)

98—Griscom, J. Milton, Philadelphia. (a) None. (b) "Posterior sclerotomy, injection of normal salt solution in vitreous chamber, bandage, bed, sweats and k. i."

99—Gross, Julius H., St. Louis. (a) None. (b) "Bichlorid of mercury internally, gr. 1/12 to 1/10. Kept patient quiet."

100—Grove, B. H., Buffalo. (a) None. (b) "I have used incisions through sclerotic, etc., with apparent advantage in a few cases."

101—Guilford, Paul, Chicago. (a) None. (b) "Absolute rest in bed, pilocarpin, sweats, dionin, k. i.

102—Hagler, A. L., Springfield, Ill. (a) None. (b) "Rest, dark room, k. i."

103—Hagler, E. E., Springfield, Ill. (a) One. (b) "Absolute rest in bed, atropin, k. i., elimination."

104—Hallock, Silas F., New York. (a) None. (b) "Have tried the usual methods of treatment, but without success, in several cases."

105—Hansell, H. F., Philadelphia. (a) None. (b) "Temporary improvement only from puncture, sweating and rest."

106—Harlan, Herbert, Baltimore. (a) None. (b) "But

have seen several improved greatly (which might be considered 'cured'), long after all treatment had been discontinued, with which rare and happy outcome I think the treatment had nothing to do."

107—Hawley, C. W., Chicago. (a) None. (b) "One case; reattachment was secured by large doses of dionin and pilocarpin sweats, but a detachment occurred later in another part of the same retina."

108—Heath, F. C., Indianapolis. (a) None. (b) "Rest in bed, iodids and other eliminatives, pilocarpin, etc."

109—Heckel, E. B., Pittsburg. (a) None.

110—Henderson, F. L., St. Louis. (a) None. (b) "Everything."

111—Herbert, J. F., Philadelphia. (a) None. (b) "Same as yours. None of my cases ever recovered full vision; the portion which had become detached, when it returned to place, lost more or less of its sensitiveness. Many detachments never did go back, in spite of every possible thing that could be thought of and done for the patient."

112—Holden, Ward A., New York. (a) One. (b) "In one case a partially detached retina became reattached permanently after about two years' time. The other eye was blind from an earlier detachment and the patient was willing to spend many months in bed and many more leading a very quiet life."

113—Holloway, T. B., Philadelphia. (a) None.

114—Holmes, C. R., Cincinnati. (a) One. (b) "Cure lasting one year. Pilocarpin injections and rest."

115—Holt, E. E., Portland, Me. (a) One. (b) See *American Journal of Ophthalmology*, 1886, for details. "Rest (not in bed), massage, diet, pilocarpin infusion, etc., as per paper of Mittendorf, of New York." (See letter in Appendix for further details.)

116—Hood, T. C., Indianapolis. (a) None. (b) "In three cases treated with pilocarpin, sodium salicylate and k. i., two went on to blindness. The third was an albuminuric: reattached and vision improved. Detachment occurred before patient died from chronic nephritis."

117—Hopkinson, George, Boston. (a) None. (b) "Have known of a case, as stated by Miles Standish, where the retina apparently split spontaneously and later became reattached, but for how long, I am unaware."

118—Howe, Lucien, Buffalo. (a) None. (b) Howe recites a case of apparent cure after puncture was made by Graefe's method with two needles. (See letter, Appendix.)

119—Jack, E. E., Boston. (a) None. (b) "Bed, pilocarpin, subconjunctival salt injections and puncture of sclera through retina at site."

120—Jackson, Edw., Denver. (a) None. (b) "Rest in bed, sweats, subconjunctival injections. Puncture of sclera and retina repeated."

121—Jean, G. W., New York. (a) None. (b) "In two years in Vienna and London and three years at New York Eye and Ear Infirmary, I have never seen detachment cured. The fashion here now is subconjunctival injections of salt solution or dionin."

122—Jennings, J. Ellis, St. Louis. (a) None. (b) "Rest in bed, tight bandage and injections (subconjunctivally) of normal salt solution."

123—Keiper, Geo. F., LaFayette, Ind. (a) None.

124—Kettlestrings, F. W., Chicago. (a) None. (b) "Have never witnessed a cure in the practice of others."

125—Kilburn, H. W., Boston. (a) None. (b) "Rest in bed in dark room, pilocarpin sweats, cathartics, compressive bandage."

126—Kimberlin, J. W., Kansas City. (a) None. (b) "None benefited by any treatment."

127—Klokke, W. E., St. Louis. (a) None. (b) "Same as yours."

128—Knapp, Arnold, New York. (a) None. (b) "I am sorry to say I have never seen any permanent results from any form of treatment, medicinal or operative."

129—Knipe, J. C., Philadelphia. (a) None. (b) "Have also tried salt solution injections without avail."

130—Krauss, Frederick, Philadelphia. (a) None. (b) "I have seen temporary results from rest, pilocarpin, iodids and scleral puncture, but have always felt that the result was not commensurate with the time and labor expended."

131—Lamb, R. S., Washington, D. C. (a) None. (b) "Cannot recall any case who would submit to the treatment, after having had explained the prospects of a cure. I have never urged treatment."

132—Lambert, W. E., New York. (a) None. (b) "The usual treatment."

133—LaForce, E. Frank, Burlington, Iowa. (a) None. (b) "Practically same as yours for two months."

134—Ledbetter, S. L., Birmingham, Ala. (a) None (b) "Iodids, fl. ext. jaborandi, pilocarpin, rest and operative treatment."

135—LaFever, C. W., Philadelphia. (a) None. (b) "Have had temporary cures. Sclerotomy has been most successful. I always give mercurial inunctions to point of gingivitis; also bandage, rest in bed, sweats, atropin, etc."

136—Loeb, Clarence, St. Louis. (a) None. (b) "Same as yours."

137—Love, L. F., Philadelphia. (a) None. (b) "Have tried most everything. In many cases there was improvement for a short time."

138—Lebensohn, M. H., Chicago. (a) None. (b) "Same as yours, medicinal treatment."

139—Lichtenberg, J. S., Kansas City. (a) None. (b) "As above; also in some cases subconjunctival injections of salt solution up to 5 per cent, with a little acoin to diminish pain."

140—Libby, G. F., Denver. (a) None. (b) "Sweating, k. i. to limit, catharsis." (See letter in Appendix.)

141—Little, A. H., Portland, Me. (a) None. (b) "Practically same."

142—McConachie, A. D., Baltimore. (a) None. (b) "Rest in bed on back, compress bandage, atropin, pilocarpin, k. i., cautery to sclera, paracentesis, subconjunctival salt solution, isotonic and hypertonic, dionin injection 10 per cent."

143—McDavitt, Thos., St. Paul. (a) None. (b) "The only case I thought was really benefited was given the following treatment: Bed in dark room, subconjunctival injections dionin. The improvement lasted a number of months. Have not heard from the case for several years."

144—McReynolds, J. O., Dallas. (a) Some. (b) (See letter in Appendix.)

145—Madden, Wm. Boston. (a) None. (b) Refers to Ellis' cases, see above.

146—Mann, G. W., Chicago. (a) None. (b) "Dr. Starky, of Rockford, had a case recover, which I saw. I do not remember the treatment."

147—Marple, W. B., New York. (a) None. (b) "I consider detachment of retina a hopeless condition. I have tried

everything." (For interesting account of Marple's experience, see letter in Appendix.)

148—Martin, H. H., Savannah. (a) None. (b) "Have tried all that I have ever heard of."

149—May, Chas. H., New York. (a) None. (b) "Most often rest on back, atropin, bandage, pilocarpin, and hot-pack sweats, iodid of potassium, etc. I have also tried sclerotomy at the situation of the detachment; also sclerotomy combined with cautery at this point. Results equally unsatisfactory in every instance. Sometimes some improvement for a few days, but invariably a return to detached condition."

150—May, J. W., Kansas City. (a) None. (b) "Practically same as yours except bichlorid in large doses, 1/10 gr. t. i. d. per orem in place of k. i. or in combination with it." (May refers to work of G. W. Maser, Parsons, Kansas, who claims "same percentage of cures as Deutschmann" and by the same operative procedures. See *Medical Fortnightly,* St. Louis, 1912.)

151—Meierhof, E. L., New York. (a) None.

152—Miller, F. W., Los Angeles. (a) None. (b) "I think I have used every possible form and method of treatment, but with no positive result."

153—Minney, J. E., Pasadena. (a) None. (b) "Rest, k. i., etc. Rest and let alone is the treatment. I consider anything else charlatanism."

154—Minor, Chas. L., Springfield, Ohio. (a) None. (b) "Have had four cases in the last few years. Not improved by any treatment, even temporarily."

155—Montgomery, W. T., Chicago. (a) None. (b) "Similar to yours. In addition have used galvanocautery puncture. Have reported these cases at meeting American Medical Association at Atlanta, Georgia, twelve or fifteen years ago."

156—Moore, C. C., Philadelphia. (a) None. (b) "About same as yours. In bed and alteratives, hg. and k. i. I have not operated on a case: believe it justifiable."

157—Moore, T. W. Huntington. (a) None. (b) "Rest in bed, pilocarpin sweats, etc."

158—Morrison, F. A., Indianapolis. (a) None. (b) "Have tried about all—iodids, rest, sweats, simple scleral punctures and deep scleral incisions. Have had very temporary improvement from scleral puncture."

159—Moulton, W. B., Portland, Me. (a) None. (b) "Same as yours with variations. Best results from rest in recumbent position."

160—Muetze, H., St. Louis. (a) None. (b) "I have tried everything recommended in the textbooks and literature of the last fifteen years. The few cases of idiopathic amotio retinæ I have seen went on from bad to worse."

161—Muncaster, S. B., Washington, D. C. (a) One. (b) "School girl, aged 18. Iodid potassium, rest in bed for six weeks."

162—Mundt, G. H., Chicago. (a) None. (b) "No results from treatment."

163—Murphy, J. W., Cincinnati. (a) None.

164—Murray, W. R., Minneapolis. (a) None. (b) "Have never gotten a permanent cure by either medical or surgical treatment."

165—Nance, W. O., Chicago. (a) None. (b) "As outlined in your letter."

166—Neeper, E. K., Colorado Springs. (a) None. (b) "Everything."

167—Norris, E. J., St. Louis. (a) None. (b) "One case of this kind, a boy aged 12, seemed to be a congenital affair. Vision was much improved by careful refraction tests but fundus remained the same."

168—Oliver, Chas. A., Philadelphia. (a) None. (b) "Absolute and protracted rest in bed, all kinds of eliminatives, sweats, purges, etc. All kinds of iodin preparations, punctures, etc.

"This has been the unfortunate experience in the above of Dr. Chas. A. Oliver."—Signed, Charles J. Jones.

169—Owen, F. S., Omaha. (a) One. (b) "Pilocarpin, moderate doses k. i., rest in bed in a dark room for four months, ten years ago, and has remained cured."

170—Paine, Geo. F., St. Louis. (a) None.

171—Pancoast, J. Wm., Philadelphia. (a) None. (b) (For interesting and unique experience with a case, see Pancoast's letter in Appendix of this article.)

172—Parker, F. P., St. Louis. (a) One. (b) "Rest in bed with subconjunctival injections normal saline solution. Think this was more providential than anything else. Aside from this one, have never seen any cures."

173—Parker, H. H., Indianapolis. (a) None. (b) "If a fresh case, rest in bed, sweats, subconjunctival injections concentrated salt solution. In one case scleral puncture. Old cases, no treatment advised except moderately frequent observation for possible tension."

174—Parker, W. R., Detroit. (a) None. (b) "Rest in bed for a period of six weeks' time, pilocarpin, steam sweats, repeated punctures and puncture with counter-puncture, including division of the retina. Often seemed temporarily improved, but never a single case of permanent cure."

175—Patterson, J. A., Colorado Springs. (a) None. (b) "Rest in bed and pilocarpin sweats."

176—Patillo, R. S., Chicago. (a) None. (b) "Similar to your own."

177—Payne, D. A., Chicago. (a) None. (b) "Have had no cases nontraumatic detachment except due to tumor."

178—Payne, S. M., New York. (a) None. (b) "Same as yours." (For result of conference with Dr. Webster concerning cured cases observed in Webster's practice, see Payne's letter in Appendix.)

179—Peter, L. C., Philadelphia. (a) None. (b) "Similar to your own."

180—Peterson, H. E., Baltimore. (a) None. (b) "About fourteen years ago, while I was resident physician at the Baltimore Eye, Ear, Nose and Throat Hospital, I had under my care a patient of Dr. Theobald's, who was permanently cured by pilocarpin sweats. The eye was myopic. I met the man on the street a couple of years ago and he told me his eye was still in good condition." (Vide infr. Theobald.)

181—Pischel, Kasper, San Francisco. (a) Two. (b) "Puncture of eyeball, electrocautery, salt injections subconjunctivally, dionin."

182—Polkinhorn, H. A., Washington, D. C. (a) None. (b) "Rest in bed, pilocarpin sweats, atropin (at times) locally; also dionin, leeching, salt injections. Final results always negative."

183—Pooley, Thos. R., New York. (a) One. (b) "Postural, k. i., pilocarpin. The rigid adherence to the postural treatment was in my mind responsible for the cure. The case was one of high myopia in both eyes."

184—Post, M. H., St. Louis. (a) None. (b) "Various treat-

ments; have never used any surgical treatment. Have seen retina reattach as a sequence of confinement in bed from other causes, but these two cases occurred so long ago that I am not very certain about the details."

185—Prince, A. E., Springfield, Ill. (a) None. (b) "Have never seen any permanent improvement effected by any kind of operative treatment for any kind of detachment. Have heard of such cases, but have not seen one myself."

186—Quackenboss, A., Boston. (a) None.

187—Radcliffe, M., Philadelphia. (a) None. (b) "Improved one case for nine months, but she finally went blind. I use pilocarpin, k. i., sweats, thyroid extract, gr. j. t. i. d., compress bandage, but all with very limited success."

188—Ranley, John, Cincinnati. (a) None. (b) "Lying flat on back in dark room, k. i. to limit, subconjunctival injections normal salt solution."

189—Ray, J. M., Louisville. (a) None. (b) "Six weeks in bed, sweats, hot baths, puncture, etc. Have seen improvement lasting a few days or a week after patient was allowed up and about."

190—Ray, Victor, Cincinnati. (a) None. (b) "Subconjunctival injections, puncture of sclera, rest in bed with eyes bandaged, sweats and k. i."

191—Reber, Wendell, Philadelphia. (a) None. (b) "Same as yours, only I add large subconjunctival injections of normal saline solution."

192—Reed, W. M., Kansas City. (a) None. (b) "Subconjunctival injections of salt, pilocarpin, rest in bed, bandaging, iodids, laxatives when necessary."

193—Reik, H. O., Baltimore. (a) None. (b) "Rest, diaphoresis, even scleral puncture."

194—Reim, Hugo, St. Louis. (a) None. (b) "Some inject a few drops of decinormal salt solution under the conjunctiva every two or three days and keep the patient on his back."

195—Remmer, N. E., Chicago. (a) None. (b) "Have had some good results by simply puncturing and letting out the fluid. Have not been able to observe them long enough to say they were permanently benefited."

196—Renaud, G. L., Detroit. (a) None.

197—Rinehart, H. D., Dayton. (a) None. (b) "Same as yours, outlined in your letter."

198—Risley, J. N., Philadelphia. (a) None. (b) "Recumbent position, posterior sclerotomy, diaphoresis; reattachment for about three months, then spontaneous complete detachment."

199—Risley, Samuel, Philadelphia. (a) One. (b) (For report on this and interesting observations, see Risley's letter in Appendix.)

200—Roberts, W. H., Pasadena. (a) None. (b) "Same as yours."

201—Rogers, W. K., Columbus. (a) None. (b) "Everything that any one has suggested."

202—Roy, Dunbar, Atlanta. (a) None. (b) Same as above. My experience coincides with that of yours.

203—Satterlee, R. H., Buffalo. (a) None. (b) "Have had some increase of vision and permanent benefit from puncturing, causing a reattachment, but no real cure in the proper sense of the term."

204—Sattler, Robert, Cincinnati. (a) None. (b) "Similar to above, beside punctures and drainage with silver wire, etc."

205—Savage, G. C., Nashville. (a) None. (b) "Such as outlined by you above. In one day this past week I had two cases, one of which had detachment of both retinas." (For interesting account of an entirely new treatment devised by Savage since the above was received, see letter in Appendix.)

206—Saxl, E., St. Louis. (a) None. (b) "Tried everything from k. i. to Deutschmann."

207—Saylor, E. S., Philadelphia. (a) None. (b) "Position and practically same course you have pursued."

208—Scales, J. W., Pine Bluff, Ark. (a) None. (b) "I have never seen a case of retinal detachment which was not of traumatic origin."

209—Schutz, W. H., Kansas City. (a) None.

210—de Schweinitz, G. E., Philadelphia. (a) One. (b) (For interesting account of de Schweinitz's experience in treatment detachment of retina, see his letter in subjoined Appendix.)

211—Schwenk, P. N. K., Philadelphia. (a) None. (b) "Pilocarpin sweats, in bed, iodids, low diet, saline purgatives. The only cases that have been cured were not detached retina, but diagnosis was in error."

212—Seabrook, H. N., New York. (a) None. (b) "Various treatment, rest, etc.; later an operative."

213—Shahan, Wm. E., St. Louis. (a) None. (b) K. i, pilocarpin, etc. I regard the condition as practically hopeless, and promptly acquaint my patients with my state of mind."

214—Sharpe, A. H., Philadelphia. (a) None. (b) "The only case I had was due to trauma and had to be operated on ten years after injury."

215—Sherer, J. W., Kansas City. (a) None. (b) "Have tried all the methods of treatment recommended."

216—Sherman, H. C., Cleveland. (a) None. (b) "Ask something easy."

217—Shoemaker, J. F., St. Louis. (a) None. (b) "Rest in dark room, subconjunctival injections dionin, internal administration k. i. and hg."

218—Shoemaker, W. A., St. Louis. (a) None. (b) "Rest in bed, sweats and k. i."

219—Shoemaker, Wm. T., Philadelphia. (a) Three or four or more. (b) "Scleral puncture evacuating the subretinal fluid."

220—Shumway, E. A., Philadelphia. (a) None. (b) "Have had none under my personal care."

221—Simpson, J. D., Minneapolis. (a) None.

222—Silex, Prof. Dr., Berlin. (See letter in Appendix.)

223—Smith, Eugene, Detroit. (a) None. (b) "Puncture of sclera, gold thread drainage, a la Wecker, rest on back and pilocarpin, kali iod., etc., etc. Treated many during past forty years: all failures. Scleral puncture afforded relief in some cases for several days, but relapses followed."

224—Smith, E. T., Hartford, Conn. (a) None. (b) "Have tried every treatment of which I have heard."

225—Smith, Jos. L., Philadelphia. (a) None. (b) "About the same as yours. We have had quite a number of cases in our hospital."

226—Snydacker, E. F., Chicago. (a) One. (b) "The only case I have seen cured was that of a young man who would not submit to any kind of treatment whatsoever. When told he must lie on his back for weeks, and even then the condition would probably recur, he refused all treatment. In a few weeks the detachment fell back in place, and four years after the detachment, to my knowledge, he was well.

227—Snyder, W. H., Toledo. (a) None. (b) "Have never had a case which even approximated a cure. If by

'cure' you mean a reposition with normal vision, I do not think it will ever be done. There is always the possibility of error in diagnosis; some cases reported as 'cured' may have been such."

228—Spratt, C. W., Minneapolis. (a) None. (b) "Rest, scleral puncture."

229—Stacey, Chas. F., Boston. (a) None. (b) "Same as yours, rest, k. i., pilocarpin and sweats."

230—Starr, Elmer, Buffalo. (a) None. (b) "Recumbent posture with eliminative treatment, scleral puncture, retinal puncture."

231—Stevens, H. B., Boston. (a) None.

232—Stieren, Edw., Pittsburg. (a) None. (b) "Same as yours."

233—Stall, K. L., Cincinnati. (a) None. (b) "None permanently."

234—Stricker, Louis, Cincinnati. (a) None. (b) "Same as your method of treatment."

235—Strout, E. S., Minneapolis. (a) None. (b) "Treatment as above with addition of dionin and 5 per cent subconjunctival injections of salt solution."

236—Stucky, J. A., Lexington. (a) None. (b) "Ditto."

237—Sturm, S. A., Pittsburg. (a) None. (b) "As above. I had one case that was operated on in 1907 by Deutschmann, of Hamburg. I saw him in 1911 again and his retina was attached. He was then suffering from optic neuritis and was almost blind."

238—Suker, Geo. F., Chicago. (a) None. (b) "Do not know of anyone who has. Treatment—too numerous to mention; one line as good as another; only temporary results. We read of cures, but do not see them. I believe operative measures give best results, such as they are. One cannot speak of 'cures' in the strict sense of the term."

239—Tangeman, C. W., Cincinnati. (a) None. (b) "Pilocarpin, sweating, rest, sealing up eye. I recall treating four cases with results amounting to practically nothing."

240—Tarum, Wm., Baltimore. (a) None. (b) "Same as outlined above." Tarum kindly sent a letter written by a layman who had gone to Hamburg to Deutschmann's clinic. As this letter is of no scientific interest, I only publish extracts from it. (See letter, Appendix.)

241—Taylor, T. M., New York. (a) None. (b) "About as you have indicated."

242—Tenny, J. A., Boston. (a) None. (b) "Have tried treatment outlined in your letter and never saw it do any good. I have some cases on hand and shall try the method set forth by Stillson, of Indianapolis, namely, letting out the liquid with galvanocautery or using a cataract knife. I shall not promise great results from what I know of the disease."

243—Theobald, Samuel, Baltimore. (a) One. (b) "Rest in bed, pilocarpin; eye was myopic. Case is reported in *Knapp's Archiv. Ophthal.*, 1900, Vol. XXIX, No. 1. In more recent cases I have thought subconjunctival injections of salt solution helpful."

244—Thigpen, C. A., Montgomery. (a) None. (b) "Tapping through sclera, cautery and trephine; constitutional treatment."

245—Thompson, J. L., Indianapolis. (a) None. (b) "Pilocarpin with profuse sweating, rest in bed, k. i. I have had a large number of cases in a practice of exclusive eye work for forty-two years and have never met with a cure. Write to Prince, of Springfield, Illinois, who can tell you of cured cases reported by other eye men in which Prince had to enucleate the cured eye." (Thompson writes further concerning the subject. See letter, Appendix.)

246—Thompson, E. S., New York. (a) None. (b) "Have tried all usual methods, but have only gotten a reattachment in a small proportion of cases. Even in these the detachment promptly recurred when the patient got out of bed. Have recently been trying subconjunctival injections of dionin after the suggestion of R. G. Reese, of New York, but have had no success at all."

247—Thorington, J., Philadelphia. (a) None. (b) "Same as yours, including the use of dionin."

248—Thorpe, L. S., Los Angeles. (a) None. (b) "Have given up treatment for this condition, excepting the relief of any conditions bearing upon the etiology."

249—Thuner, A., Detroit. (a) None. (b) "About the same as yours."

250—Timberman, N., Columbus. (a) One. (b) "Complicating pregnancy and albuminuria; abortion induced, elimination treatment, hot packs and pilocarpin sweats. Vision,

p. 1 before treatment (oc. ambi), became: Right 20/40, Left 20/30. The retina was positively detached." (See letter, Appendix.)

251—Tingley, L. P., Boston. (a) None.

252—Tivnen, R. T., Chicago. (a) None. (b) "Absolute rest, recumbent position, dark room, sweats and k. i."

253—Todd, Frank C., Minneapolis. (a) None. (b) "Rest in bed with depletion (sweats); but I give such a poor prognosis that most patients do not take treatment; therefore, experience is limited and unsatisfactory."

254—Turnball, C. S., Philadelphia. (a) None. (b) "Same treatment as yours, except that the full doses of k. i. followed a full mercurial course in advance, and my only success has been in 'traumatic cases.'" (Turnball facetiously remarks as a travesty on "statistics" that he has "likely cured" twenty or thirty cases in as many years.)

255—Turner, J. B., Philadelphia. (a) None. (b) "The case I reported was well for two months after rest in bed with head depressed, but relapse ensued after riding over rough roads." (Turner refers to a case now under treatment in the hands of P. H. Moore, Philadelphia, which is doing well after one scleral puncture and draining off the subretinal fluid combined with numerous punctures through sclera and retina with surgeon's needle. No return of detachment in five weeks; too soon to report "cured.")

256—Tydings, O., Chicago. (a) None. (b) "Rest in bed, subconjunctival injections, pressure bandage, pilocarpin sweats, iodids, salicylates, etc."

257—Tyson, H. H., New York. (a) None. (b) "Saline injections (subcon.), sweats, salicylates, iodids, rest in bed, four to six weeks or longer."

258—Valk, Francis, New York. (a) None. (b) "Believe no treatment of any service except in recent detachment, when operative interference may be of much service."

259—Verhorff, F. H., Boston. (a) None.

260—Vinsonhaler, F., Little Rock. (a) None. (b) "Pilocarpin, rest, k. i."

261—Walter, Will, Chicago. (a) None. (b) "Same as yours."

262—Ware, L., Chicago. (a) None. (b) "Nor have I ever seen a case of detachment cured. Have had a number my-

self and have seen several in consultation. Treatment same as yours."

263—Weed, H. L., Buffalo. (a) None. (b) "About same as you have outlined. Have used no surgical measures."

264—Weeks, John E., New York. (a) None. (b) "Have treated two cases by multiple punctures penetrating the retina. Reattachment over the punctured areas occurred and was maintained while the patients were under observation, six weeks and four weeks, respectively, after the last series of punctures. Vision was very considerably improved in both cases."

265—Weils, David W., Boston. (a) None. (b) "Have no permanent cure to my credit. Have never tried any operative treatment, depending on rest in bed. Inclined to try the scleral puncture."

266—Wescott, C. D., Chicago. (a) None. (b) "In over twenty-five years of experience have seen no case of non-traumatic detachment of the retina permanently cured, and my assistant has been through my records carefully, that I might speak by the card."

267—Wiener, A., New York. (a) None. (b) "As above, including operative measures."

268—Wiener, Meyer, St. Louis. (a) Four. (b) "Rest in bed, restricted liquids, small doses k. i., occasionally bromids." (Wiener lays great stress on the value of the roller bandage and rest in bed and subconjunctival salt solution. He has two cases now undergoing this treatment combined with the usual local and general measures, both of which are very promising. He writes of a case of cure that occurred in a classmate of his who suffered a detachment fifteen years ago. Cure complete.)

269—Wilkinson, Oscar, Washington. (a) One. (b) "Rest in bed, pilocarpin injections, sweats, k. i. and hg. The man was fourty-four years old, myopic, detachment about 2/5 nasal field; gave specific history; large doses k. i. and hg. I think did the work. It was a typical detachment and not a subretinal gumma."

270—Willetts, J. E., Pittsburg. (a) None. (b) "Nothing. I have always considered the condition incurable and so tell the patient. If treatment is insisted upon, rest, iodids and

dark room, but I have never seen any benefit derived. Have never tried withdrawal of fluid with hypodermic needle."

271—Williams, C. H., Boston. (a) None.

272—Williams, E. R., Boston. (a) None.

273—Wolfenstein, L., Cleveland. (a) None. (b) "Compressive bandage, sweating, bed, eliminants, subconjunctival injections saline solution. Never tried operative measures."

274—Woodruff, F. E., St. Louis. (a) One. (b) "Subconjunctival injections dionin with rest in bed. This case was supposed to have been cured before by the use of normal salt injections. Vision was 17/150, and was improved to part of 20/40. Patient had myopia of 5 D. This improvement has held since February 26, 1912, to date, May 25, 1912. Don't know how long it will last."

275—Woodruff, H. W., Joliet, Ill. (a) None.

276—Woods, Hiram, Baltimore. (a) None. (b) "I have seen two or three cases reattach after prolonged rest in bed and pilocarpin sweats. One such case was reported to American Medical Association."

277—Würdemann, H. V., Seattle. (a) None. (b) "I have, however, seen two cases of spontaneous reattachment of the retina occurring after retinitis nephritica gravidarum. Oeller's Atlas, C Tab. III, C Tab IV, also shows two punctures and give case histories. The anatomopathologic lesions do not warrant the assumption of a cure from any form of treatment in nontrauamtic cases, i. e., myopia, tumor, diabetes, etc."

278—Wyler, Jesse, Cincinnati. (a) None.

279—Zentmayer, Wm., Philadelphia. (a) None. (b) "One for eighteen months. Bed, on broad of back, atropin, roller bandage, sweating and purgation, subconjunctival injections of normal salt solution, sclerotomy, Deutschmann's operations and trephining the sclera."

280—Ziegler, S. Lewis, Philadelphia. (a) Several. (b) "T-shaped posterior sclerotomy. I referred to one notable case of this kind in discussing Casey Wood's paper before the American Medical Association. I have always intended trying galvanocautery puncture with a sharp, thin, well-heated wire, but have not so far tried this. Have used electrolysis with only moderate results. I think this condition is

due to a perverted lymphatic secretion, and that is why I feel sure the cautery ought to be of some service."

281—Zugg, C. L., Kansas City. (a) None. (b) "Dark room, sweats and k. i."

APPENDIX.

The following letters came unsolicited, and since they contain some unique personal experiences as well as interesting and valuable data, I publish them. They are arranged alphabetically.

Dr. Ellett, of Memphis, recites a case of double detachment, in which "the eye to which nothing was done is in better shape than the one to which much has been done."

"Dear Doctor Vail:

"I answered your circular letter in regard to detachment of the retina to the effect that I had not seen any good results from medical treatment. Since then I have seen a patient, whose history I am sure would be of interest to you. She is an elderly lady, in good health, and with no eye trouble except presbyopia.

"In June, 1911, she suddenly lost the sight in the right eye, due to detachment of the retina. I treated her with rest in bed and sweats for nearly four weeks, but I did not insist on her lying absolutely quiet, because it was very irksome for her to do so, and I did not believe she would be benefited by the treatment. At the end of the four weeks I told her that I thought further treatment would be useless. At that time her left eye was perfectly normal. In December she had exactly the same experience with the left eye. In sent her to New York, where she has been ever since under Dr. Week's care. He treated her exactly as I had done for the other eye, except that he was very strict about the rest, and she was not permitted to raise her head from the pillow for some weeks. As the result of this the retina reattached in the left eye and her vision improved to about 20/200.

"As soon as she got up the retina became loosened again and the vision failed. He then did scleral puncture several times and the retina became attached, and the vision, when she left New York some two weeks ago, was 20/200. I examined this lady yesterday, and the significant thing to me is

that the right eye, the one to which nothing has been done, is in better shape than the left, to which so much has been done. Of course the right eye partook of the benefit of the rest in bed, which was prescribed for the left eye, but the detachment in the right occurred in June, and after the treatment was stopped nothing was done until after the left eye became affected in December. When I examined her in December the retina in the right eye had regained its color, but still seemed to stand further in the vitreous, and the vessels could be seen with about a + 7. I think there are several interesting points about this case and therefore relate it. Her vision now is about 12/200 in the right eye and 10/200 in the left. In both eyes the retina is reattached except in the lower part of the field in the left eye. In the corresponding portion in the right eye there are some pigment changes, consisting of streaks lying parallel to the vessels.

"Yours very truly,

"(Signed) E. C. Ellett."

Dr. E. E. Holt, of Portland, Maine, reports that after twelve years a myope of high degree retained good vision in an eye that had had its retina detached and replaced.

"Dear Doctor Vail:

"I am returning your letter of the 4th inst. answered in the affirmative. The case that impressed me as most important was that of a lady about fifty years old, who had detachment of the retina. She had myopia of high degree and had consulted several different oculists in different parts of the country, as she and her sister traveled about the country. I think it was right after Dr. Mittendorf, of New York, read his paper before the American Ophthalmological Society, detailing the treatment of detachment of the retina by the use of nitrate of pilocarpin and an infusion of pilocarpus. A detailed account of the treatment I reported in the *American Journal of Ophthalmology* in 1886, I think in December. This case of high degree of myopia with detachment of the retina came back to see me for over twelve years and there was no recurrent attack, she having a useful eye and binocular vision.

"Yours very truly,

"(Signed) E. E. Holt."

Dr. Lucien Howe, of Buffalo, had a case that recovered "almost perfect vision," but alas, after some years a relapse occurred.

"Dear Doctor Vail:

"In acknowledging your suggestive inquiry of May 4th, it is difficult to say of course that a permanent cure has been effective in any individual case.

"I do recall a young man, however, then living in the town of Olean, who had a distinct nontraumatic detachment with almost total loss of vision. Puncture was made by the Graefe method with two needles, and some improvement followed within about a week, and later he regained almost perfect vision. It could be stated, however, that he also lay quietly for some two or three weeks and went through the usual sweating process. Moreover, some years later a relapse occurred, though this did not impair the vision in a decided degree.

"We will all be interested to know the result of your inquiry.

"Very sincerely yours,

"(Signed) LUCIEN HOWE."

Dr. George F. Libby, of Denver, comes forward with a unique case. Note that a detachment occurred three years ago; this was followed by unusual phenomena.

"Dear Doctor Vail:

"My treatment was sweating and k. i. to limit and catharsis. Have just enucleated an eye in which 'spontaneous' detachment occurred in November, 1909, blindness soon supervening. Later, severe cellulitis (no increased tension). Found a tumor springing from sclera and corresponding to detachment exactly. Macroscopically it is fibroma; we shall determine what it is microscopically soon.

"Yours cordially,

"(Signed) GEORGE F. LIBBY."

Dr. J. O. McReynolds, of Dallas, Texas, has had some cures, but evidently is anxious to find something better than what he has used in the past.

"Dear Doctor Vail:

"Your letter of recent date with reference to detachment

of the retina I have just received, and in reply will say that I have at this time a very important patient lying flat on his back in the same condition. I shall be very much delighted if you will give me any information which you may possess with reference to this condition. I will say, however, that I have succeeded in curing some of these cases, and I shall look up the records and ascertain more accurately what was done in those cases, and also ascertain the amount of vision which they have at present, if I can get into contact with the patients.

"Assuring you that I shall be glad to give you a fuller report at a subsequent time, I am

"Very sincerely,

"(Signed) Jno. McReynolds."

Dr. Wilbur B. Marple, of New York, has "run down" a "cured" case, but is not entirely satisfied that it was a real case of detachment, in spite of the eminent oculist who handled it. Marple is "from Missouri" on the subject of detachment, having had plenty of experience with all kinds of treatment. He asks for one case of undoubted cure. We can forgive Marple for being disgusted with all forms of treatment up to date—we are, too.

"Dear Doctor Vail:

"I was somewhat interested in your circular letter recently received, for I have been trying to run down a case of cured detachment of the retina without success. I recently heard of a so-called cured detachment of the retina in the person of Dr. Henry Blodgett, of Bridgeport, Connecticut. I wrote him about a month ago, having heard of his case last summer through a friend of Dr. Wilson, of Bridgeport, while I was in Europe, and I received the following reply:

"'In the summer of 1884 I found a black spot in my right eye, which did not disappear promptly, so I went to Dr. Herman Knapp about it. He said there was a detachment of the retina at that spot. Later a smaller one appeared in the other eye. I think he considered the cause of this detachment to be choroiditis. I spent a good deal of the time for the next three months in the dark, and made comparatively little use of my eyes for a year. Since then I have had no other trouble, although my eyes are congenitally very defective

(hypermetropic + 6) and astigmatic with the astigmatism in different axes).'

"I was with Dr. Knapp for a good many years; in fact, at the time of which Dr. Blodgett speaks, in the summer of 1884, I was at the Institute at Twelfth street. It takes a good deal of nerve to dispute a diagnosis made by Dr. Knapp at that time, when I think he was about in his prime. As you see, the patient is not myopic and he speaks merely of a 'spot'; so that his vision could not have been at any time very seriously impaired. I personally consider a detachment of the retina (in my hands the traumatic cases have not been especially better) as a most hopeless condition. I have tried everything —confinement in bed, pilocarpin and steam sweats, iodids, etc., ad lib., ad infinitum. The last thing I tried was a treatment suggested by Mr. Ramsey, of Glasgow, in 'The Transactions of the Ophthalmological Society of the United Kingdom, in 1906'—subconjunctival injection of dionin. The following winter I had eight or nine cases of detachment of the retina in my service at the New York Ear and Ear Infirmary, in every one of which I applied Mr. Ramsey's remedy most conscientiously, associated in some cases with the scleral puncture. I did not cure (!) a single one; in fact, the vision in each patient gradually deteriorated, as it inevitably does in these cases. From experience of my own, I am disposed to think that the most likely thing to produce a reattachment is cauterization of the sclerotic, as suggested by Dor, of Lyons, and by Uhtoff, of Breslau; but I never had the nerve to apply such a barbarous treatment to a patient yet.

"I consider the prognosis in detachment of the retina, especially in myopia, as practically hopeless, whatever treatment is applied; and I think that any one who is acquainted with the pathology and etiology of this condition could not expect otherwise. My custom at present in these cases in my private patients is to tell them plainly how extremely improbable any improvement is, and to say, furthermore, that if it was my own eye, I should not feel inclined to give it up without any attempt at treatment; and to suggest that we try confinement in bed and subconjunctival injections of dionin for two or three weeks with compressed bandages. If any improvement sufficient to warrant continuance of the treatment is shown, to act accordingly.

"If you hear of any case of undoubtedly cured detachment of the retina, I wish you would tell me of it, because I have yet to find such an authentic case. Deutschmann's statistics are discredited by his colleagues in Germany, although, as he claims them, his results are not especially brilliant.

"Yours very truly,

"(Signed) W. O. Marple."

Dr. J. Wm. Pancoast, of Philadelphia, recounts a thrilling experience with a case with which he had a "running start." This is in two ways the most unique case on record—first, it happened to a patient while in an oculist's office; second, it followed a routine examination for glasses. Here is food for thought.

"Dear Doctor Vail:

"In reply to your series of questions regarding the nontraumatic form of retinal detachment.

"I have the histories of four such cases; the first three did not respond to any form of treatment, and after several consultations and months of unsuccessful treatments, the patients disappeared.

"The one unique case happened in my office, immediately after a refraction under duboisinæ.

"Mr. A. S., aged thirty-two, was refracted by me in November, 1900, under duboisinæ. Right and Left. Right — 1.75 ⊃ — 0.50 + 180 =5/5; the ophthalmoscopic examination was negative.

"In April, 1906, he returned with the symptoms of asthenopia, and while the ocular examination was negative it was decided to go over the correction. The ophthalmoscope never showed the slightest pathologic change.

"His second refraction was the same as the old one, giving a part of 5/4, a slight increase of the acuity in each eye.

"After I finished he waited in the office for some time, expecting a friend.

"About half an hour after the examination he complained of a pain in the right eye and blurring of the vision.

"With his glass the vision of the right eye was 5/150, and that only by a distinct turn of the head. The ophthalmoscope showed a retinal detachment up and out, small in size, but very distinct. The left eye was not disturbed. The patient

was at once removed to his home, bed, dark room, low diet and a dry one, pilocarpin, sweats of various kinds, potassium iodid, alternating and changing of salts.

"The retina reattached and in about six weeks the eye was apparently quiet, with a good field and corrected vision of 5/7.5, slighily blurred. I continued treatment and semi-dark room for a total of four months, and then gradually allowed the patient to return to his usual habits.

"He retained his condition for a period of fourteen months, December, 1908, when the same retina and over the same area, but to a greater extent, detached, and treatment with frequent consultations were without avail, so that after another six months' treatment, including puncture and electric treatment, vision being nil, the patient stopped treatment.

"This is the only case I have ever seen reattach and it was only temporary.

"Sincerely yours,

"(Signed) J. Wm. Pancoast."

Dr. S. M. Payne, of New York, was with Webster, of New York, years ago, when Webster had some cases that did well after sclerotomy. Payne thought he had a clue which would reveal some cured cases, but alas! the cases were lost sight of.

"Dear Doctor Vail:

"Treatment was the same as yours. Dr. Webster, years ago did a sclerotomy in a number of cases, two of which resulted in reattaching, but they were lost sight of, and he does not know whether the attachment remained or not.

"Please pardon my delay, which was due to waiting to see Dr. Webster. As I was with him when he cured those two cases, I wanted to know of him if they were permanent. His other cases, which were not operated on, were treated the same as yours and none cured.

"Yours truly,

"(Signed) S. M. Payne."

Dr. Samuel Risley, of Philadelphia, recited a case which he thinks should be called "traumatic," but if the eye was not subject to direct violence, it would not be traumatic in the strict sense of the term. It is granted that all eyes "predisposed" to detachment, sooner or later will get the "jar" which will act as the "last straw." Such cases should not be

classified as "traumatic." It was a remarkable cure either way you take it, but will it last?

"Dear Doctor Vail:

"I think your experience in the case of detachment of the retina is entirely in accord with my own experience and that of others. It is somewhat difficult to answer your categorical inquiries, however, for the reason that detachment of the retina, even in predisposed eyes, has, in a vast majority of instances coming under my notice, been ascribed to traumatisms. For example, in two of my cases, one a professor of English literature in one of our colleges, who had been under my care for many years for his myopic choroiditis, was thrown to the ground by the premature starting of a trolley car and got up with detachment of his retina. In this case he was placed in bed in the hospital, had periodical sweats with an electric light bath, pilocarpin internally and atropin alternately with a weak solution of eserin for six weeks. He had a myopia of 12 D., with, I think, 1½ diopters of astigmatism in addition; that is to say, 13½ of myopia in the highest meridian. I had the satisfaction of seeing the retina replace after six weeks, and at last accounts, a year or more ago, and about four years after his accident, he had had no recurrence and his vision was approximately what it had been before. This case, although in a sense traumatic, was in a highly myopic eye with the characteristic choroidal changes. I cannot recall any other case of retinal detachment in sick eyes.

"On the other hand, a prominent physician, who had been my patient for many years with a myopia in the highest meridian in both eyes of 22 diopters, and who had developed a large macular atrophy in the right eye and later a cataractous lens, was knocked down by a bicycle, rose up with detachment of his retina in the better eye and has never recovered. I have in the considerable number of cases had the satisfaction of seeing the detached retina reattach itself, but no sooner were the patients out of bed and about their ordinary affairs than the detachment recurred. The first case alluded to is the only one I can remember in which treatment was successful. Although occurring in a predisposed eye, it does not come within your inquiry, for the reason that it followed a traumatism.

"My treatment has been rest in bed with atropin locally and of late years electric light baths and usually a bandage.

"Very truly yours,

"(Signed) SAMUEL D. RISLEY."

Dr. G. C. Savage, of Nashville, comes forward with data which, if time corroborates, will make him the discoverer of the golden grain of truth in all the chaff which we have been threshing out. Dr. Martin H. Fischer, referred to in his letter, is professor of physiology of the Ohio-Miami Medical College, Medical Department of the University of Cincinnati. Fischer addressed the American Academy of Ophthalmology and Otolaryngology at the annual meeting held at Indianapolis in 1911, on the subject of Glaucoma. (See 1911 Transactions.) The application of Fischer's theory to detachment of retina was first made by Savage, and his letters here published should awaken our hopes anew.

"Dear Doctor Vail:

"If I were going to the next meeting of the Academy of Ophthalmology, I would keep a secret from you and spring it at the meeting. I recall receiving some questions from you concerning retinal detachment, and I think I am correct in the surmise that you were preparing a paper for the Academy on that subject. I know I recall that you stated in the experience of twenty years you had not been able to cure a case. You will recall that I have had a similar experience, as reported to you. Now I hasten to say that my luck has at last changed. A few weeks ago I had three cases of retinal detachment come in within an hour of each other. The three eyes, however, were in two patients. A little girl had double detachment, and a student in Vanderbilt had a single detachment. The student was entering his final examinations for his degree in the university. I had so little hope for him I told him to go ahead with his examinations as if nothing happened to him, and that I would probably be able to accomplish as much for him as if he were to go to bed and remain perfectly quiet. I gave him the iodid of potash and the bichlorid of mercury, and found when his examinations were over that he was no worse, and probably just a little better as to his central vision. He had no vision above, at all. The day after his examinations had been concluded, two weeks ago to-morrow, I stated to him, 'I am inclined to think that

the fluid which has detached your retina is acid in reaction, and if it is, then I believe I can accomplish something for you with a new method of treatment.' He said, 'Try it.' His vision was 2/100. I gave him a subconjunctival injection of fifteen drops of twenty-five grains of the citrate of sodium to water one fluid ounce, after the Fischer idea in glaucoma, and, to my great delight, his vision was much improved in twenty-four hours. A week ago yesterday, I gave him the second injection, his vision having in the meantime gotten still better, and yesterday I gave him a third injection. Just before giving him the third injection, I found his vision equaled 20/40. In one hour after giving him this third injection, I saw a patient in consultation with Dr. Price, who had had a detachment of one retina for three weeks. His direct vision had been nothing, but under the treatment of iodid and bichlorid, it had improved until it was 3/200. Eighteen hours after the injection Dr. Price brought him into my office again, with his face all wreathed with smiles, and the patient was also smiling, for his vision in this short time had risen to 8/30. The remarkable result in this last case, taken in connection with the result in my first case, leads me to believe that I have introduced into ophthalmic practice a method which is worth while. I will not be able to see the little girl who had the double injection yesterday until Saturday, or possibly Monday next. Her direct vision was nothing in the one eye, and in the other eye was about 6/100. I will report to you the result in her case, and will make later reports concerning my first case. In each of the cases I am continuing to give the iodid and bichlorid. You may use this letter in connection with the presentation of your paper before the meeting.

"Yours fraternally,

"(Signed) G. C. SAVAGE."

A few days ago I received the following communication from Savage, which contains remarkable reports on two more cases similarly treated.

"Nashville, Tenn., Aug. 3, 1912.

"Dr. D. T. Vail, Cincinnati, Ohio.

"Dear Doctor:

"Your letter was received yesterday. The fact that you are to present your paper to the Academy constitutes a

great temptation to me to break into my plans and attend the meeting. I know, however, that I cannot yield to this temptation. I am struck with the plausibility of your theory concerning retinal detachment. It certainly is an explanation that appeals to me more than any other that I have seen.

"Since writing you last I have had two other cases of detachment of the retina, one blind for nine months and the other for one year. I did not know what I might be able to accomplish with either one of these cases by the injections, but am glad to report that gratifying results have followed.

"It is allowing too much to say that either one of these cases had vision equal to 1 200. The one of nine months' duration improved from the very first, had vision equal to 1 4 after the third injection, and this was attended by a reduction of the detachment from 7 D. to 4 D. at the highest point. This was case No. 5 in my series. Case No. 6 is the one blind for a whole year, and she had no hope that anything could be done for the blind eye. She came three weeks ago today, simply to get a better lens adjusted to the good eye. As my custom is, I looked into the bad eye to see the cause of the blindness and was delighted to find a detachment, notwithstanding its long duration. I of course did not know that I would get results in a case of so long duration, but instituted the treatment at once. Her vision came up rapidly after the first injection and has continued to improve until now it is 1 4.

"The other cases reported to you have continued to do well. Case No. 1, the Vanderbilt student, has 3 4 vision for distance and can read the finest Jaeger type. It is now seven weeks since the first injection was given. The detaching fluid continues to disappear, but the retina is not yet in contact. Most of the vessels can be seen well with a + 10 D., but those at the highest point of detachment require a + 20 D. to be well seen.

"If your theory of lessened activity of the glands in the ciliary body is correct, it is the height of absurdity to evacuate the fluid through a scleral puncture, for these already inactive glands could not quickly secrete water to prevent the diminution of the tension of the globe. I had already claimed, before receiving your letter, that the fact that the tension is not lessened in my osmotic treatment, is due to the other fact that water is supplied to the vitreous body by the glands in the ciliary body in quantity to correspond with the

exosmosis of the detaching fluid. In all of my cases I have given one grain of the iodid of potash and 1/100 of a grain of bichlorid of mercury after each meal, to improve the nutrition of the ciliary body, thereby promoting the secretion of the glands in that body. For many years I have been following this line of treatment in beginning cataract, the good results coming from the improved nutrition in the ciliary body.

"If your theory had been advanced before my thought of injecting the citrate of sodium to produce exosmosis, I could not have fallen on a better plan of treatment than the injections associated with the small doses of iodid of potash and bichlorid. Your theory, whether thought of before or after my first communication was mailed to you, explains very satisfactorily the results which I have gotten in five out of six cases of detachment.

"I believe that I have given to the profession the therapeutic plan for detachment of the retina, justifying the hope of very frequent cures.

"To put patients in bed with detachment of the retina, I think wholly unnecessary, and might go even further to say that it might be harmful.

"Use any part or the whole of this letter in connection with the presentation of your paper. It is about what I would say if I were present to participate in the discussion.

"Yours fraternally,

"(Signed) G. C. Savage."

Dr. G. E. de Schweinitz, of Philadelphia, has had many cases and quite a number of temporary "cures," but as they all relapsed sooner or later, he has become "perfectly pessimistic about the permanency of the cure." Read his letter

"Dear Doctor Vail:

"Replying to your circular letter, I have to say that without going through a long series of case books, I could not possibly give you the exact number of nontraumatic detachments of the retina upon which I have performed operations with the hope of curing them. I have a good many times operated for detachment of the retina, and so far as I know at the present writing, with perhaps a single exception, the cure has not been what may be called permanent. I have a number of times seen the retina reattach itself after operation and remain in position, sometimes for a week, months, and in

one case for more than a year, and then either partial or total redetachment has occurred. Like many other surgeons, I have seen a number of traumatic detachments of the retina apparently permanently cured, and one case of nontraumatic detachment which remained cured for several years. I have not, however, heard of the patient for a long time and therefore cannot say what the present result is.

"The treatment that I have found most satisfactory has been posterior sclerotomy with drainage of the subretinal space, rest in bed, and the injections subconjunctivally of saline solutions. In recent years I have added to this dionin, sometimes sweats, usually with pilocarpin. I have never performed Deutschmann's operation, nor ever attempted permanent drainage. I am perfectly pessimistic about the permanency of the cure of detachment of the retina which occurs in myopic eyes and which is not due to traumatism, although I have had some astonishingly good temporary results, and for that reason I always do the best I can for these patients when they come to me for treatment.

"Yours very truly,

"(Signed) GEORGE E. DE SCHWEINITZ."

Prof. J. Hirschberg and Prof. Dr. Silex, both of Berlin, have been written to regarding their success in the treatment of this disease. They both reply in the same strain, giving a guarded opinion as to the prospects of curing a given case, and advising that such patients remain on this side of the Atlantic, for, as Prof. Hirschberg pertinently remarks, "Ocean travel is dangerous for such cases." He also refers to a case of his which he had many years ago given up as hopeless, which, without any treatment, but on the contrary going about as he pleased, began to improve, and recovered quantitative vision, and another case that improved beyond all expectations after a cataract was removed. I regret I have mislaid Prof. Hirschberg's letter. Prof. Silex writes as follows:

"Dear Doctor Vail:

"I am sorry that I do not see any other special treatment for the case of detached retina than you have tried. Though I would like to help him, I cannot promise to do so. It would be at his own risk to come over for that purpose. The best,

however, for a patient is to remain in the United States, keep quiet as much as possible and follow your advice.

"Very sincerely,

"(Signed) Dr. Silex."

Dr. Wm. Tarum, of Baltimore, had a case which went to Prof. Deutschmann's clinic at Hamburg. Letters from "laymen" should not be published in scientific literature. I shall, therefore, withhold the patient's name and only publish such parts of his letter as interest us who have had patients go to Hamburg to investigate Deutschmann's cures.

"Dear Doctor Tarum:

"Well, doctor, although my mission was a dismal failure, I am forced to state that it was not due to the lack of Prof. Deutschmann's skill. I remained in the 'clinic' ten weeks. I was more than repaid for my long, tiresome journey by gaining the knowledge that separation of the retina is lifted from the list of incurable diseases. By his method of treating this particular disease, Prof. Deutschmann is curing 50 per cent of the cases, and the remaining 50 per cent are benefited to such an extent that they are able to go about unassisted. It seems as though there are no results discernible until after the fourth or fifth month. I met one patient whose vision had been restored after eighteen operations, covering a period of time extending over nine months; then again, I conversed with a former patient who was visiting the clinic, and who informed me that he had received forty-eight operations and that he was a patient in the clinic twenty months. He had suffered with detachment of the retina in both eyes, but was completely restored to perfect vision. The operations follow in rapid succession, until it is evident that there is an adhesion taking place, then the patient is compelled to remain flat on his back and the operations become less frequent. I was a close observer of the professor's method of treatment and can say without fear of contradiction that there is nothing about it that any other oculist cannot do and obtain the remarkable results that are credited to this famous oculist. The evident facts are 'that he is doing it—others are not.' He uses electric massage, and his serum to revitalize the nerves of the eye. Although this said serum has not received the support of the medical fraternity, I have seen some wonderful results from its use. Doctor, I shall not make myself

ridiculous by trying to give you a description of Prof. Deutschmann's 'scarotomy' method of treatment, as I know that you are more thoroughly acquainted with it than I am, but this I can say, it is the means through which the 'separated' blind can look forward to as their hope of salvation. I must be taken into consideration that very near all of Deutschmann's patients have exhausted every other means before they seek his aid.

"The patients of the clinic were quite a gathering of cosmopolitans, as every part of the globe was represented among them. There were patients from Peru, Ecuador, Mexico, South Africa, Poland—in truth, all parts of Europe were represented. In distinction they ranged from barons to stokers.

"Well, doctor, I will bring this letter to a close, but let me say in conclusion that I am so much impressed with the 'scarotomy' treatment that at times I feel like puncturing my eye with a hat pin, in hopes that I may set up a good genuine irritation, then tie myself in bed so that I cannot move. I am still supplied with a beautiful display of pyrotechnics, as a gentle reminder that I have detachment, etc.

"JOHN DOE."

Dr. J. L. Thompson, of Indianapolis, has convictions based on experience. Read his letter:

"Dear Doctor Vail:

"My opinion concerning cures in cases of nontraumatic detachment of the retina is that they are very few; doubtless the cures have been when effusions have caused the retina to bulge forward and simulate detachment. It calls for a great stretch of the imagination for one to believe that a complete detachment has become reattached in many cases. The reason why I have never operated in these cases is, first, my belief that cures by operation are so rare; second, if we operate and no success follows, we are liable to be accused of injuring the case by so doing.

"Very sincerely yours,

"(Signed) J. L. THOMPSON."

Dr. A. Timberman, of Columbus, Ohio, has had a case like the one recited by Francis and also Wurdemann (see above). Since all these cases recovered, we may say 'Here is a cure,'

but alas! it must be first caused by albuminuria in pregnancy, which is the forerunner of blindness, eclampsia and death.

"Dear Doctor Vail:

"I have your communication of several days ago relative to cases of detachment of the retina. I had one case of partial detachment of the retina in each eye, vision reduced to light perception or little better, complicating pregnancy. Gave the following history: Whooping cough and scarlet fever at seven; mild attack, no renal complications; malaria at ten years, followed by pulmonary hemorrhages. Married seven years previous to my seeing her. No children. Miscarriage about two years after marriage; six months' gestation. Two years later, another at three months; no evidences of renal trouble during the last gestation. Another miscarriage February, 1910, at five months, with marked albuminuria. On the 22nd of February she was taken to the hospital with barely light perception. Was put upon eliminative treatment, hot packs, pilocarpin, sweats, and abortion produced. Final correction of the vision of refractive error after recovery was — 0.25 ⌒ — 0.25 ax. 90° right eye; — 2.0 ⌒ — 0.25 ax. 90° left eye, vision being 20/40 right eye, 20/30 left eye.

"I don't want you to think that this was a case of questionable detachment of the retina, because it was not. All the characteristic signs by the ophthalmoscope were present. The only case that I have had which terminated so favorably.

"Very truly yours,

"(Signed) ANDREW TIMBERMAN."

POSTAPPENDIX.

We now come to ask ourselves, why do we meet with such failure in treating this disease? Is it incurable, as stated by some? Or is it because we do not apply the proper remedies, not knowing the exact cause?

I believe it is curable in many instances. I believe we will cure the majority of the cases when the cause is recognized. My paper has already exceeded the time limit, and what I have to offer by way of a theory to explain the disease will of necessity have to be brief.

Collins and Mayou, in their work on Ocular Pathology (p. 168) mention the two following theories as to the cause of detachment of the retina: (a) The exudative theory, whereby

there is an exudation behind the retina from the choroidal circulation, accompanying chronic equatorial choroiditis. (b) The traction theory, whereby the retina is torn and dragged away from its bed by bands of adhesion which have formed in the shrinking vitreous.

von Hippel and Leber have combined these two theories by stating there is a circular choroiditis causing disturbed nutrition of the vitreous, which later becomes fibrous and contracts, so that a displacement of the vitreous forward from anterior adhesion of the vitreous to ciliary occurs, thus creating a free space under the retina, which space becomes immediately filled with transudation of serum, etc.

Granting any or all of this to be true, may we ask how can a cure be expected from cutting, cauterizing, resecting, bisecting, transfixing, inserting gold wires, silver wires, injecting sterilized air in the vitreous, or iodin under the retina, trephining, suturing the retina to its bed, or any other such line of treatment? Do any of these cure equatorial choroiditis?

Evidence is presented in the above published correspondence showing that one man was "cured" by Deutschmann after forty-eight stabbing operations. I asked Prof. Deutschmann at the Oxford Ophthalmological Congress in 1909 what he defined as a cure. He answered, "When the retina was no longer detached it was a cure." I asked, "Regardless of visual result?" He answered, "Yes, regardless of the amount of vision retained or recovered."

The rationale of Deutschmann's operative treatment is to create adhesive inflammation between the choroid and retina. What does this mean? It means that inflammatory exudate should be induced to form between the choroid and retina, which, when it becomes converted into fibrous or scar tissue, will tie the retina down to its bed. Does the retina in health adhere to the choroid? No, the pigment layer does, but there is a physiologic space between the retina proper and its pigment layer, which was created there when the secondary optic vesicle formed completely in embryo. The "rationale" of Deutschmann's theory is, therefore, "irrationale."

My theory is that there is a paralysis of the secretory function of the ciliary processes. This means that the secretion of aqueous is suddenly arrested. There being nothing wrong with the drainage channels within the eye, the watery

elements find ready egress, thus causing a minus tension. Leber found 90 per cent had minus tension. The withdrawal of normal tension causes passive hyperemia of the blood vessels of the tunica vasculosa. This allows diapedesis and transudation. The vitreous contracts because it loses its percolating supply of aqueous, which soon drains off through the efferent channels which are wide open, and the fibers of the vitreous naturally contract like a sponge would contract after losing its water.

The subretinal transudation is highly albuminous. The watery elements ooze away and are replaced by fresh serum, a poor substitute for aqueous. The tissue colloids and circulating colloids imbibe all the moisture they can. The reaction of the transuded juices becomes altered to a less than normal alkaline or an actually acid state.

What causes paralysis of the secretory function of the ciliary processes? The cause may be acute local and systemic, or chronic local.

Acute local from concussio oculi, dazzling, certain drugs which paralyze secretory function, like belladonna, duboisin, etc., where the patient has idiosyncrasy or the preceding equatorial choroiditis, or myopia.

Acute systemic from certain toxemias like those of albuminuria, diabetes, possibly acetone, indican, etc., which have a paralyzing effect on the delicate secretory function of the ciliary processes, or cause an acute inflammation of the cervical sympathetic nerves or ganglia.

Chronic local from slowly progressive atrophy of the secreting epithelium of the ciliary processes, causing a gradual loss of function. This may result from equatorial choroiditis extending forward to involve the cilary processes, myopia of high degree, atrophy of the ciliary body in advanced presbyopia, etc.

We know that in myopia the ciliary body becomes enormously atrophied from nonuse. The ciliary processes partake to a certain extent in this atrophying process, since they receive their blood supply from branches of the same arteries which supply the ciliary muscle. Myopia has been found in over 60 per cent of the cases.

Age causes vascular sclerosis everywhere, and if there is a part highly specialized and supplied with a network of capil-

laries, like the ciliary processes, such a part gradually diminishes in its physiologic function. A sudden, exciting influence may cause it to lose its weakened function entirely. To reverse the argument: Given loss of secretion of the aqueous, what would result? Answer: Minus tension, deep chamber, dilated pupil, contracted vitreous and detachment of the retina.

There are many other arguments to sustain this theory; I have touched only a few.

If arrest of secretion of aqueous is the cause, what may be expected from treatment? I shall answer first in the negative and say that from "k. i. to Deutschmann" nothing. And now in the positive. First, attempt to reestablish the aqueous flow by "alkalinizing" the intraocular juices. This may be done as Savage has reported (see *Ophthalmic Record*, June, 1912) by the subconjunctival injection of sodium citrate after Prof. Fischer's ideas. (See 1911 Transactions American Academy Ophthalmology and Oto-Laryngology, Prof. Martin H. Fischer on glaucoma.)

Second, by inducing a return of normal aqueous secretion by the use of such local measures as hot fomentations and general measures as alkaline purgatives, sweats, sodium salicylate, pilocarpin and the iodids.

Third, by directing treatment to the cervical sympathetic ganglions and nerves, such as rubefacients, blisters, massage, electricity, general depletion, and alteratives. The future will reveal the proper therapy, surgical and medicinal, which will take into account the influence of the cervical sympathetic ganglions and nerves on this disease.

These measures should be preceded by a good mercurial purge, followed by salts, rest in bed in a dark room, roller bandage to sustain the tension of the eye, for the minus tension prolongs the paralysis of aqeous secretion, and in fact all those measures and only those which have for their central idea the reestablishment of the secretory function of the ciliary processes. To summarize briefly:

First.—The established medical treatment of detached retina is a failure, because the etiology of the trouble is not recognized;

Second.—The surgical treatment is not founded on scientific principles and is therefore brutal;

Third.—Detachment of the retina is not a disease, it is a symptom.

Fourth.—The disease of which detachment is a symptom is paralysis of function of the ciliary processes, causing arrest of aqueous secretion within the eye.

Fifth.—The treatment should be the use of those measures and only those which have for their objects the reestablishment of the lost function of the ciliary processes.

DISCUSSION.

After the reading of the paper, the discussion was opened by Dr. Samuel Risley, of Philadelphia, followed by Dr. G. C. Savage, of Nashville, Prof. Anton Elschnig, the guest of the society, Dr. Allan Greenwood, of Boston, and others. Their remarks will be published in full in the Transactions of the Society. Vail's closing remarks were as follows:

I regret that the hour is so late, for I feel assured that others present would have participated in the discussion had the hour of adjournment not already passed.

I have seen detachment of the retina in several cases of hypermetropia. Dr. Risley says he has never seen it in such cases.

There seems to be some confusion as to the definition of "idiopathic," or "spontaneous" detachment. By reading over the letters which are contained in the body of my paper, it will be observed that some consider the slight traumatism which these patients relate as being responsible for the detachment, to be the real cause of the detachment. As a matter of fact, the traumatism was only a determining influence. A definite, although quiet, disease of the eye existed prior to the accident; otherwise detachment would never have occurred. We who have not this disease present within our own eyes may meet with much severer traumatism and suffer no detachment. The disease present in eyes that eventually suffer detachment is one affecting the secreting epithelium which covers the ciliary processes. If we search the equatorial region of the fellow eye, which as yet suffers no detachment, we may see distinct evidences of equatorial choroiditis.

The tendency of so-called anterior or equatorial choroiditis is to extend forward over the ciliary body, affecting this selective epithelium, which controls the aqueous supply

In studying the embryologic formation of this so-called secreting epithelium, we find that it grows forward from the edge of the optic cup in embryo, completing the imprisonment of the invaginated mesoderm which goes to make the vitreous and shutting off this mesoderm as well as the lens vesicle from the outlying mesoderm which forms the choroid and sclerotic.

As soon as its formation is complete its peculiar function begins, that of selecting the aqueous from the blood contained in the tufts comprising the ciliary processes and secreting it within the closed chamber of the eye as pure aqueous. This peculiar epithelium has no analogy in the body, unless we consider the epithelium of the glomeruli of the kidneys to be analogous. Both select watery elements from the blood and then secrete it; one as urine, the other as aqueous. Paralysis of secretion of urine may exist, and so may paralysis of secretion of aqueous. The one produces death, if not relieved promptly; the other, detachment of the retina. I have seen cases of anuria. I remember such a case. The patient had anuria, followed by coma. He was sweated and he recovered, and has remained well ever since (six years). Such an arrest of secretion of aqueous will, according to my theory, cause detachment of the retina, as explained in my paper.

Prof. Elschnig, whose kind discussion I very much appreciate, and I wish to thank him for it, calls attention to a theory of Schnable, thirty years ago, which, he says, is similar to the one I have promulgated and which Schnable called the "neurotic theory."

In my paper I made no reference to the ciliary nerves. My thought is directed rather to the epithelium, which becomes "dried up," as it were, a distinct progressive atrophy or degeneration of the epithelium of the ciliary processes alone and not in any way due to nervous impulse.

The disease I refer to progresses gradually and slowly for years, and finally reaches a climax by some ordinary everyday accident, which just suffices to precipitate what would sooner or later occur any way, namely, complete arrest of aqueous and consequent detachment of the retina.

Dr. Savage uses the solution of sodium citrate subconjunctivally, of course. That question was asked by one of the speakers.

I wish to thank those who so kindly discussed my paper.

II.

A SIMPLE METHOD AND EQUIPMENT FOR QUICKLY AND ACCURATELY DETERMINING LENSES TO CORRECT ASTIGMATISM.*

D. E. Sulzer, M. D.,

Paris.

With the introduction of the ophthalmometer into clinical practice, the partisans of its use immediately proposed a modification in the manner of designating the direction of the axes of cylindrical lenses, or, what amounts to the same thing, the principal meridians of astigmatism. Prior to the introduction of the ophthalmometer, astigmatic notations most generally used were symmetric; the graduations moving, for one eye, in the same direction as the hands of a clock, and in the opposite direction for the other eye. The letter "t" (temporal) or "n" (nasal) completed the expression, indicating the direction in several systems. The zero was placed on the vertical or on the horizontal, on the temporal or on the nasal side, according to the system in use. With the object in view of adapting the notation of astigmatism to ophthalmometric practice, using at the same time the same units of expression, the "Société Francaise d'Ophtalmologie," at its meeting of May 2nd, 1887, appointed a committee composed of Messrs. Javal, Georges Martin, and Parent, with a request to submit to the members of the association a system of notation for lenses for correcting astigmatism. The committee recommended the replacing of the symmetric notation then in use by a notation which would be the same for both eyes. As a result of this recommendation the members of the association separated into two groups: those in favor of the same notation for both eyes, on one side, and those in favor of the symmetric notation on the other. The first group was

*Read before the Société Francaise d'Ophtalmologie, at its annual meeting, held in Paris, May, 1912.

composed of those partisan to the ophthalmometer; the second, of its adversaries, as, when it first appeared the ophthalmometer had, as is the case with inventions, veritable adversaries who were more or less rabid in their opinions of it, and who waged what might be called an open war against its adoption, rather than simply refraining from using it.

In order to avoid using, on the ophthalmometers, ophthalmoscopes, optometers and clock dials, a double division—

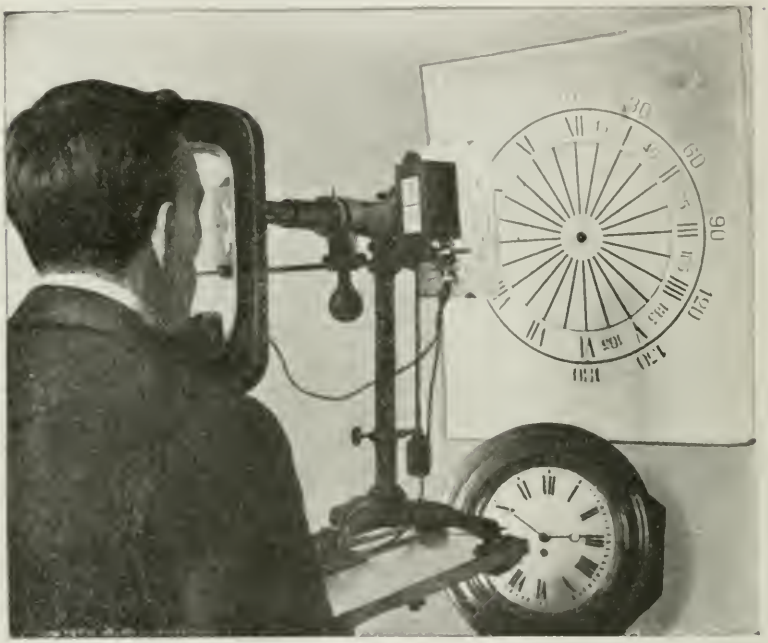


FIGURE 1.

which is a perpetual source of error—the committee of 1887, in reporting, placed at the beginning of the resolutions which it proposed, the following decision: The graduation of all instruments shall be the same for both eyes. Second to this came the proposition that the graduation be continuous, and that the zero be placed vertically on the dial and horizontally on the trial frame. These locations of the zero were inspired by the desire to designate by direction 0° the most frequent

cases. In fact, an eye having astigmatism conforming to the rule, slightly near-sighted or having become so, will see more distinctly the vertical diameter of the clock dial. The cylindrical concave lenses to correct such an astigmatism, when placed in the trial frames, would have its axis directed according to the horizontal, which is designated by 0°. The gradnations on the clock dial move in a "direct" sense; on the trial glasses, in an "indirect" sense. By the expression "direct sense" is meant in the direction taken by the hands of a clock; the "indirect sense" refers to the direction opposite to that of the hands of a clock. Instruments to be graduated

FIGURE II.

in the "direct" sense, the zero being placed on the vertical in graduating the ophthalmometer. After these propositions had been discussed, the "Société" added to the committee previously named, Messrs. Meyer and Landolt. In a report one of the new members proposed a symmetric notation based on a vertical line passing through the middle of the head of the patient; the other new member proposed a symmetric notation based on vertical planes passing through each eye. Upon the proposition of M. Javal, definite decision was withheld until the following year. For reasons unknown to us, the discussion of this subject was never resumed at the meetings of the "Société Francaise d'Ophtalmologie."

The principal objection to the system wherein the graduation of the instruments is the same for both eyes, was that it is difficult to understand. There is no doubt that the zero in one position on the measuring instruments, and in another position on the trial frames, must at first have astonished those accustomed to determining an astigmatism solely by the usual test lenses, who, at that time, were greatly in the majority. It is most evident, also, that the advantages of a similar notation for both eyes could be fully appreciated by those expert in the use of the ophthalmometer, who, in 1887, constituted but a small minority of the profession. Since that time, however, the continually increasing number of ophthalmometer experts has reversed this proportion of the adherents to the system, or systems (as, unfortunately, they do not all agree as to the location of the zero) of similar notation for both eyes; and it was with great surprise that they learned that the International Congress of Ophthalmology, which met at Naples from April 2 to 7, 1909, had accepted a system of notation symmetric with respect to a plane passing through the center of the head.

It was not long before protestations were made against this measure, in favor of a similar notation for both eyes.

In considering the various phases of the problem of determining the degree of astigmatism and of its correction by means of cylindrical lenses, not only with regard to the prescription of spherocylindrical lenses, but also their manufacture and mounting, one comes to the conclusion that this problem could be simplified, thereby greatly economizing time and labor for the ophthalmologist and optician, at the same time reducing the possibility of errors in executing orders for lenses.

If the committee of 1887 placed the zero on the vertical of the dial and measuring instruments,* but horizontally on the test frames, the gradnations in the former moving in the direction taken by the hands of a clock, and in the opposite direction for the latter, that complication (more apparent

*The ophthalmometer is today the only recognized measuring instrument—the ophthalmoscope equipped with refractors and cylinders, and the optomometers being no longer used for determining the degree of astigmatism, since the skiascope has been found to be an excellent check for lenses determined by the ophthalmometer and the test lenses.

than real) had in view the designation of the direction of the astigmatism by the same figure in the ophthalmometric measure as in the prescription for the cylindrical lenses. But this coincidence occurred only when using a concave cylinder in correcting the astigmatism. When a convex cylinder is used its axis must be placed at right angles with the concave correcting cylinder, and the coincidence so laboriously established between the ophthalmometric measure, the diameter easiest seen on the dial, and the formula indicating the cylindrical correcting lenses, disappears. True, it is possible, and even preferable to correct the astigmatism exclusively by means of concave cylinders combined, if necessary, with the suitable convex spherical lenses; lenses are thus obtained having a larger central field of perfect vision than the same combination obtained by the aid of the convex cylinder. But this rule encounters exceptions in the case of correcting lenses for aphakia and excessive hypermetropia and, even had these cases been excluded, the complications caused by the different positions of the zero would still have existed. The problem, therefore, may be expressed as follows: Is it possible to arrange a system of notation in which the same units shall designate (1) the ophthalmometric measure, (2) the direction of the diameter on the dial best seen by the eye which is slightly near-sighted or which has been rendered so, and (3) the orientation of the cylindrical correcting lenses in the trial frames, whether they be concave or convex.

Under the present status of the matter, the solution of the problem is impossible, as the axis of a concave cylinder correcting a given astigmatism, forms a right angle with the axis of the convex cylinder for correcting the same astigmatism. A slight modification of the present manner of orientating cylinders would permit of solving the problem and at the same time bring the orientation of cylinders in harmony with the general principles of optics. To accomplish this end it would suffice to orientate the cylinders according to the direction of the minimum of their convergent action, instead of orientating them according to the direction of their axes. Cut in the sense of its axis, a convex cylinder shows a flat section; this is its direction of minimum convergence, as all its other sections are planoconvex. There is, therefore, no change made in the orientation of the convex cylinder in the

proposed system. Cut in the sense of its axis, the concave cylinder also shows a flat surface, but all its other sections are planoconcave lenses with negative convergent action: the strongest planoconcave section is that perpendicular to the axis of the cylinder; in other words, the minimum of the convergent action of the concave cylinder is perpendicular to the axis of the concave cylinder. When we orientate cylinders according to the minimum of their convergent action, the notation of the ophthalmometric measure, the orientation of the diameter best seen on the dial, and the orientation of

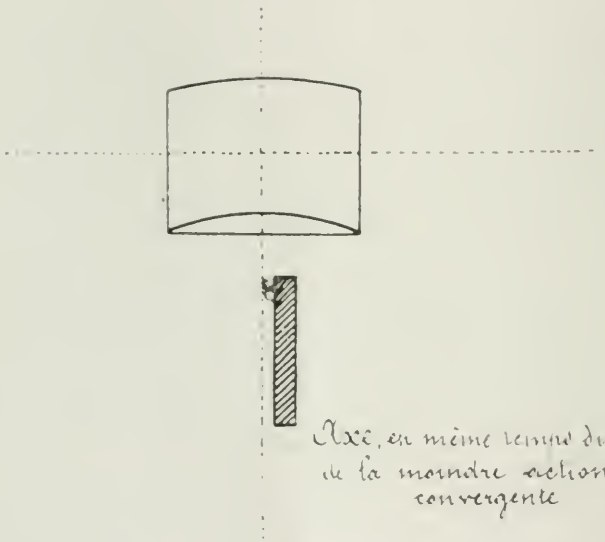


FIGURE III.

the correcting concave or convex cylinders will coincide, and will be expressed by one and the same figure. Since it is generally agreed that it is more practical to begin the graduations of the dial at the top of its vertical diameter and to have such graduations move as the hands of a clock, the same graduations will be taken for the ophthalmometer, while the coincidence of the figures will be obtained on the trial frames, if, when placed in front of the dial, they be graduated from the same point, but in the direction opposite to that of the hands of a clock. Such graduations will go from 0° to 180°,

the zero and the figure 180 at either end of the vertical of the dial, and the figure 90 on the horizontal.

When these principles are established a practical and convenient form should be given to our equipment, which could be accomplished in the following manner: Instead of making the cylinders in the box of trial lenses, round, have them rectangular in form, the longest side of the convex cylinder being parallel to the axis, and the longest side of the concave cylinder perpendicular to its axis. A corresponding rectangular socket would be cut in the trial frames to receive the cylin-

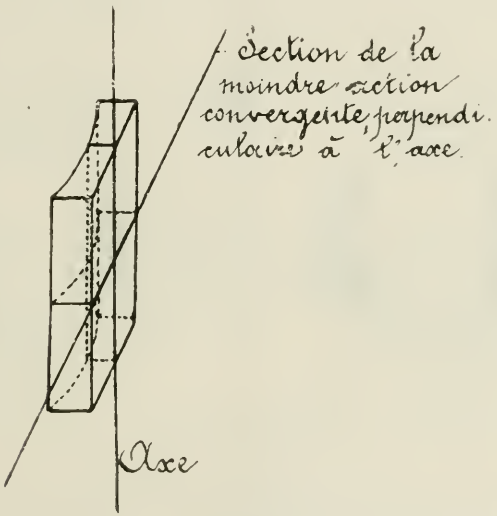


FIGURE IV.

ders and give them the exact position and assure their retaining it without the operator having to occupy himself therewith until he is ready to refer to the graduations on the trial frames to note on his prescription the position found for the cylindrical correction.

The cylinder is placed behind the spherical lens in the trial frames; every time the cylinder is combined with a convex spherical lens, the relation of the two surfaces will be reproduced in the lens ground from one piece only, and mounted. When the cylinder is combined with a concave spherical lens

—and in this case a concave cylinder is always understood—the final lens would have its cylindrical surface in front, the spherical surface next to the eye, just the opposite to the disposition of the two separate lenses in the trial frames. The concave spherocylindric combination being very thin at the center, this difference in the relative alternating of the two surfaces has very little effect upon their optical action.

To ascertain immediately, and without any mental effort, the direction represented by a given figure, it is only necessary to imagine the patient seated in front of the dial, the direction 0° falls on twelve o'clock; 30° one o'clock; 90° three o'clock, and so on. This comparison will be as useful for the

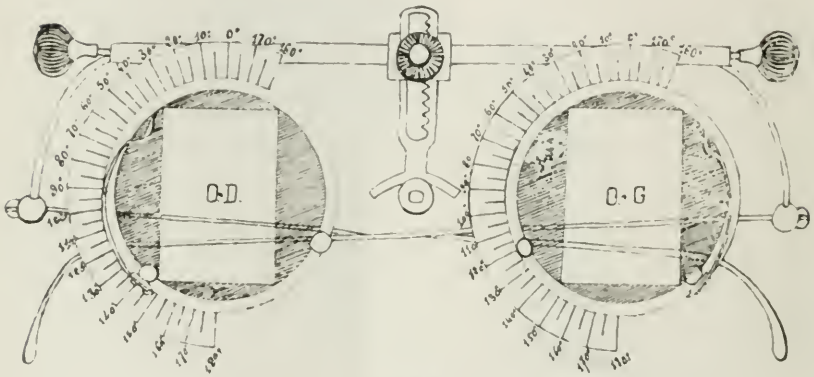


FIGURE V.

ophthalmologist as for the optician called upon to mount the lenses.

In what form could the prescription best be written?

No one has ever felt the necessity of placing over his left eye the word "left," or the word "right" over his right eye; and in consequence a person never labels his left eye "right" or vice versa. Use the same reasoning for the lenses; place the lens for the left eye on the left, that for the right eye on the right; and as everyone writes from left to right, it would seem natural to commence with the measurements of the left eye at the beginning of the line, and follow on the same line, after a semicolon, with the measurements for the right eye. This method is almost universally accepted in expressing

ophthalmometric measurements. It would greatly simplify matters to proceed in the same manner in writing the prescription for lenses.

Assume, for example, that the ophthalmometer indicates that in each eye the vertical meridian is two dioptrics more refractive than the horizontal meridian:

$$0° + 2.0; 0° + 2.0$$

A "subjective" examination shows that the total error of refraction is corrected in each eye by a concave cylinder of two dioptrics combined with a convex spherical lens of four dioptrics, which combination is preferable, as far as the field of vision is concerned, and by a convex cylinder of two dioptrics combined with a convex spherical lens of two dioptrics, which combination is easier to grind. The two prescriptions would be expressed in the following manner:

$$0° - 2.0 + 4.0; 0° - 2.0 + 4.0$$
$$0° + 2.0 + 2.0; 0° + 2.0 + 2.0$$

We think that this formula and manner of writing the prescription would facilitate the work of the optician having to grind and mount the lenses so prescribed. The optician would have to remember but three things:

First—That the left lens is on the left side, the right lens on the right side.

Second—That the directions indicated by the figures followed by the sign "°" are the same as the direction of the hands of a clock, the patient facing the dial.

Third—That, in the case of the convex cylinder, the direction 0° coincides with the axis, while in the case of the concave cylinder, it is perpendicular to it.

In the preceding article, which is purely a practical one, I have refrained from referring to the bibliography of the subject. I should, however, like to call attention to the following facts: The use of the dial in determining astigmatism was proposed by Messrs. Armaignac and Boucheron, and at the same time by the committee of 1887; that the use of the expression "right" and "left" was discontinued by Mr. Javal, who had taken the idea from the Americans; that the only innovation contained in this article is that of orientating the cylinders according to the minimum of their convergent

action, of making them rectangular in form, of placing them in a fixed position, the direction of their convergent action coinciding with the zero of its division, in a rectangular opening in the trial frames, and, finally, of placing the cylinder in the trial frames nearest the eye under examination, the spherical lens in front. By reason of this disposition the spherocylindrical lens, ground from one piece, closer resembles the spherocylindric combination obtained by the aid of two lenses placed in the trial frames, than the present disposition where the cylinder is placed in front, the spherical lens being next to the eye under examination.

III.

A NEUROTIC CASE OF KERATITIS PUNCTATA SUPERFICIALIS.

William Linton Phillips, M. D.,

Buffalo.

Keratitis nonsuppurativa is referred to by Fuchs as having a superficial and a deep form. The superficial form he divides into pannus and keratitis with formation of vesicles. The latter form he further subdivides into (1) herpes febrilis corneæ (Horner), (2) herpes zoster corneæ, (3) keratitis vesiculosa (et bullosa).

Herpes febrilis corneæ may be further divided, for he speaks of "a form of superficial keratitis which is related to herpes febrilis corneæ, but is not associated with formation of vesicles." This form he terms keratitis punctata superficialis.

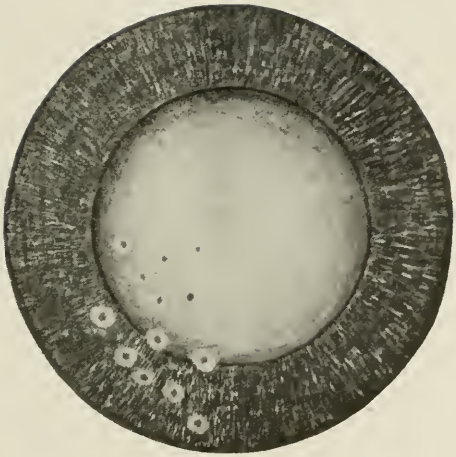
There seems a difference of opinion as to the proper name of keratitis punctata superficialis. De Schweinitz, in his textbook, says that it is referred to as keratitis subepithelialis centralis; keratitis maculosa; noduli corneæ, and relapsing herpes corneæ. Because of these different names and descriptions of this form of keratitis by different authors, we may be discovering new forms of this same disease, for this case of keratitis punctata superficialis, which is about to be described, does not correspond to any other case heretofore described, in mode of onset, duration, kind of spots and their location. We find in Stellwag's case a similar affection, but even this description differs.

Keratitis punctata superficialis is both infectious and neurotic. The neurotic form is rare, both in the literature of today and the clinic. At least that has been my experience, for this is the first case to come under my observation. The infectious form is quite common.

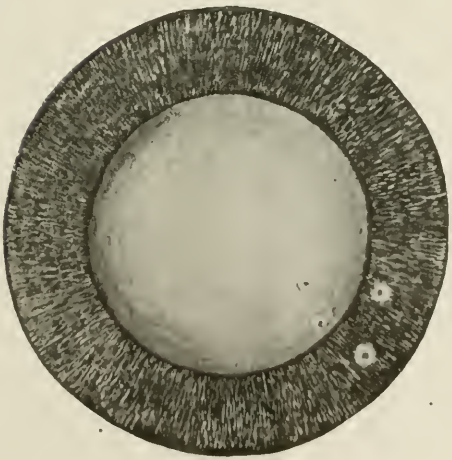
In a résumé of the literature of keratitis punctata superficialis we find the history usually starts thus: In young peo-

ple, with symptoms of an acute conjunctivitis associated with a nasal catarrh. Immediately following this inflammatory stage, or sometimes later, there appear massed in the central portion, or scattered irregularly over the corneæ, ten to one hundred gray spots in groups or short rows. These dull gray spots, caused by the bulging of the epithelium, nodular in shape, lie in the superficial layer of the corneæ near its center, but rarely in its margin, like this new case. These spots may affect both eyes, and usually remain almost unchanged for months, then gradually disappear.

Case.—July 16, 1909, Miss P., who was training to be a nurse, consulted me for the following symptoms: The right eye at times was quite painful and felt as if it contained sand. There was no photophobia nor lacrimation, except under strong sunlight. Inspection of lids and eyeball revealed no foreign body—in fact, nothing warranted a further examination, for the bulbar conjunctiva, the pupil, the tension and the vision were normal. Examination by means of the ophthalmoscope and oblique illumination revealed ten to fifteen bluish gray spots, surrounded by a light gray halo, situated in the lower right quadrant of the right cornea. These spots were not dull, like other described cases of keratitis punctata superficialis, but glistening like the rest of the cornea; and at the apex of each spot there was a dark gray infiltration. Collectively these spots resembled a pyramid situated between two radii drawn from the corneal center to temple horizontally, and from the corneal center vertically downward. This pyramidal form never changed throughout the course of the disease, and although certain spots disappeared at times, they have always remained between the two radii. A few months later the left eye became involved in the corresponding quadrant. These spots were noticed at first to be more numerous and larger toward the limbus, and smaller in size and less numerous near the corneal center. But this proved to be erroneous; for, upon keeping the eyelids separated for some time, the halo disappeared in proportion to the drying of the corneæ. In fact, some of the spots also disappeared, only to reappear upon closing and opening the eyelids again, showing that the halo was caused by moisture and that the spots were in the epithelium. The general health of the patient was normal except that she had a high-strung, nervous system. Dif-



R.E.



L.E.

ferent remedies applied locally improved the condition of the eye temporarily, but in time it returned to its usual severity. After studying the case thoroughly for the cause, it was discovered that the disease increased in proportion to loss of sleep and nervous strain, and because it always involved the corresponding portions of each cornea, like neurotic diseases affect the skin, the patient was treated by refractions, nerve tonics, good elimination, diet, and at last mental suggestion. Under this treatment the patient became less nervous, and by doing so she overcame her self-consciousness, so that at the present time, August 15, 1912, the disease is practically cured, although even today she has to be careful and not overdraw from her reserve nerve force or there will appear in the corneæ one or two spots which are fleeting in their duration.

The salient points of difference between this and all other heretofore described forms of keratitis punctata superficialis are the glistening spots instead of dull ones, the situation of these same spots in each cornea in the lower temple quadrant only, and its long duration—three years—without any injurious effect.

IV.

SYPHILITIC PSEUDOHYPOPYON.

Professor Rollet, M. D.,

Lyon, France.

Translated by Jesse S. Wyler, M. D.,

Cincinnati.

Extravasation of pus into the anterior chamber is termed hypopyon. This condition has been treated for centuries, as a general rule, like all suppurations, by evacuation of the pus (puncture or incision). Since a subcutaneous fluctuating gummi can be mistaken for an abscess, because of the puriform, half-fluid contents (which is not pus, but merely broken down gummatous material), so even through a clear cornea mistakes can occur regarding the pus of a hypopyon. In a word, there exists a gummatous discharge into the anterior chamber, constituting a pseudohypopyon, which heals rapidly under general syphilitic medication. This determination is of the utmost importance in making a prognosis and in the treatment of a lesion which can rapidly produce blindness.

Under the name pseudogummatous hypopyon, I described in 1904 and 1908 a clinical form of gummatous syphilitic iritis.[1] Since then I have found new cases to add to the old ones. Besides, I have recently been able to observe a syphilitic pseudohypopyon which was not iritic in origin, but rather corneal. Let us examine the different varieties.

I. Syphilitic pseudohypopyon when symptomatic of a gummi of the iris. In order to diagnosticate, it is necessary in this form not only to examine the local lesion, but the general condition of the patient. Softening gummata being located principally in the lower segment of the iris, the pseudohypopyon conceals them completely, and obstructs the study of the pathognomonic characteristics. There is no coexisting

corneal ulcer in the presence of this hypopyon; the pseudohypopyon is less mobile and rough than the real one, is slightly irregular at its upper margin, is not orange color, but rather that of new gold, rich in small vessels or small blood clots, with the iris above clear or congested, as the case may be.

If the patient is luetic the pseudohypopyon can occur amongst the secondary symptoms, or even when the chancre is cicatrizing, or, as in another case, it was twenty-six years after inoculation that we saw the lesion develop.

I wish to mention of how much importance it is to recognize this pseudohypopyon as soon as possible, in order that the proper therapy may bring about a rapid healing. I have recently reexamined those cases which corroborate the optimistic prognosis as to sight which I made formerly. Lately I have been able to reexamine one of my patients about whom I wrote in 1904. A thin cicatricial line, visible only with the corneal microscope, is the only trace of his iritis, although an optic iridectomy will be necessary to give him good vision. This I proposed eight years ago. A short time ago I operated for senile cataract on one of my patients who had been recently cured of a pseudohypopyon. His visual acuity is 1/6 after extraction of the lens.

In the treatment it is well to obey the old adage which applies to all similar syphilitic lesions: Do not touch a gummi. Fear to make a puncture or incision in a secondary stage; rely upon mercury and, above all, iodid (I was going to say iodid alone).

II. Where the pseudohypopyon is symptomatic of a gummatous infiltration of the cornea. Here is an observation upon a patient living at home, in whom we (my clinical chief, Lucien Grandclément, and I) were able to check rapidly a gummatous lesion of the cornea. A man of fifty-four years attacked with hypopyon is treated during the month of September according to the regular methods—incision, cauterization and subconjunctival injections. Progressive loss of sight, and then phthisis oculi. In November the other eye becomes affected. In the anterior chamber can be seen a crescent of purulent material, a yellowish, thread-like track running across the upper corneal segment in the form of a bundle. Interrogation reveals that he had had a chancre eighteen years before. A diagnosis of luetic gummatous infiltration of the cornea

with pseudohypopyon was made; it is a condition of parenchymatous lesion with intact epithelium and without any ulceration. A mixed treatment, consisting of daily administration of 8.0 iodid of potassium and muscular injections of 2.0 biniodid of mercury, soon gave good unilateral vision; nearly normal to an individual who for many days had suffered the worries of a sudden and complete blindness.

It is possible in this case to contrast the two methods of treatment applied to the two eyes and compare the entirely different results.

The diagnosis of a like lesion is simple, but it is necessary to bear this possibility in mind. The test of staining with methylene blue rules out the corneal ulcer and the possibility of a pneumococcus hypopyon. In interstitial abscess of the cornea we have an irregular yellow spot with peripheral grayish halo, which is the thread that we have mentioned. An anterior syphilis of the eye should always make us think of a gummatous lesion, in the absence of an epithelial defect. We do not insist upon circumscribed gummata of the cornea or nodular gummatous keratitis such as we have studied in the thesis of Söderlindl[2] in order to make a diagnosis; such lesions are not accompanied by hypopyon, and they approach nearer interstitial keratitis, from their flint-like appearance.

III. We have considered limited gummata of one region (iris and cornea), with slow progress and recession under internal treatment. In other cases the entire eye is invaded by a rapidly developing iridocorneal infiltration.[3] We have published a case where the pseudohypopyon was only a symptom of the secondary stage along with the other previous phenomena, as iridocyclitis and panophthalmitis, of rapid virulent progress. This patient, age thirty-five years, despite a most energetic treatment (k. i. 15.0 and injections over a long period), became blind and then succumbed to pulmonary, hepatic and renal gummata. Today it would be possible to effect a cure in such a destructive case by means of arsenobenzol.

IV. In addition to these visible lesions of iritic or corneal origin, does a primary pseudohypopyon exist not secondary to lesions elsewhere? I do not know of such a report. Every time one sees a thick discharge into the anterior chamber with-

out apparent change in the walls, it would be well to consider a symptomatic pseudohypopyon and search for the cause in the ciliary body.

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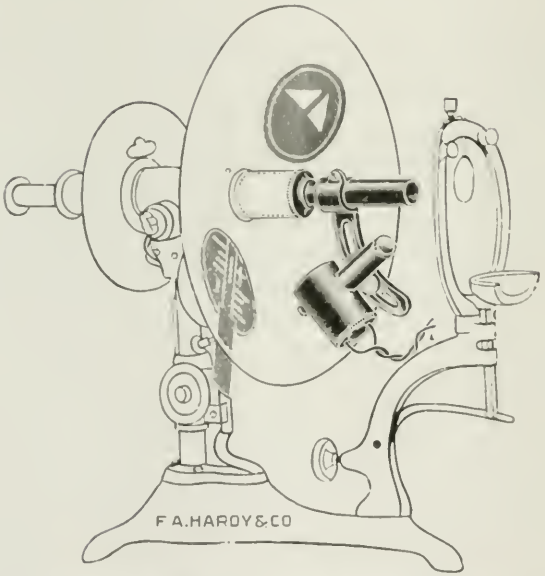
V.

AN ACCESSORY TO THE OPHTHALMOMETER, FORMING A CORNEAL MICROSCOPE.

HARRY S. GRADLE, M. D.,

CHICAGO.

There are two good binocular corneal microscopes upon the market, but their price is prohibitive except for a clinic. Con-



Gradle's Accessory to the Ophthalmometer.

sequently this instrument was devised to bring within the reach of the practicing ophthalmologist a means of accurately studying the anterior aspects of the eye.

Reduced to its simplest terms, an ophthalmometer consists of an ocular, an objective, and an intervening birefringent prism. By removing the prisms we have left a tube

containing an ocular and an objective—in other words, a microscope. To accomplish this the truncated conical tube was removed from the anterior part of the ophthalmometer and there was substituted another similar tube, but containing only the objective lenses. This gives us a microscope with a magnifying power of from six to eight diameters.

The illumination of the eye is accomplished by the addition of an arc to the anterior end of the microscope tube. This arc bears a simple eight candle power lamp actuated by the ordinary lighting circuit. The rays from this lamp are condensed upon the eye by the usual device, and by reason of the arc over which the lamp slides, these rays are constantly focussed upon the eye. This completes the addition to the ophthalmometer and forms a simple microscope, which can be constantly at the command of every practicing ophthalmologist.

This device is manufactured exclusively by F. A. Hardy & Company.

VI.

THE SOCIOLOGIC ASPECT OF ERRORS OF REFRACTION.*

WILLIAM ZENTMAYER, M. D.,

PHILADELPHIA.

The bearing of ametropia to sociology may be considered in its relation to conservation of vision, to efficiency of labor, as a factor in education and in the moral development of the child, to its influence upon the mental processes of the individual, and in its relation to workingmen's compensation laws, and as a factor in safeguarding entrusted human lives.

Conservation of Vision.—While a direct causative effect of errors of refraction can be traced in but few of the serious diseases of the eye which may ultimately lead to blindness, and thus become a distinct sociologic factor, that they play a not unimportant contributing cause in many cannot be denied. The proneness of hyperopic eyes to glaucoma is to be found largely in the anatomic peculiarities of such eyes, but the excessive contraction of the ciliary muscle required for the correction of the focal defect, with its accompanying congestion of the uveal tract, undoubtedly acts as a predisposing factor. The influence of errors of refraction in the production of cataract is exerted in the same way. Amblyopia ex anopsia, usually due to an error of refraction, leaving, as it does, the afflicted individual with only one useful eye, increases the chance of total blindness from disease or accident. In the presence of a dyscrasia, astigmatism and hyperopia are to be considered as possible exciting factors in the causation of inflammatory diseases which may terminate in blindness.

Efficiency of Labor.—In the broad scheme of increasing the efficiency of labor, a problem that today is engaging the atten-

*Read before the Section on Eye, Ear, Nose and Throat Diseases of the Medical Society of the State of Pennsylvania Scranton Session, September 24, 1912, in a symposium on "Conservation of Vision."

tion of the sociologist, the direction of energy along the lines of least resistance, the organization of teamwork, and the proper alternation of periods of work with periods of rest, are important, but all are of secondary importance to the maintenance of health and the improvement of the functioning of the special senses, more especially those used in a given employment, the impairment of which is almost of a certainty to affect deleteriously the others.

In all professional, clerical, textile and mechanical occupations, in which the work is performed at such distances and is of such a character that the power of accommodation is constantly employed, in short, in almost all callings except the class broadly designated as the laboring class, normal eyes or eyes rendered so by optical or surgical treatment are essential to full efficiency of the individual.

Factor in Education.—An important consideration is the effect of eyestrain upon the mental development of the child, and the possible effect upon its character, disposition and trend of thought. We are all familiar with the backwardness of children directly traceable to the existence of ametropia. This may be due to an error of refraction sufficient to materially reduce vision, or of a less degree associated with an unstable nervous system.

Factor in Moral Development.—It is no mere fancy to say that if such errors be overlooked and the child find study difficult or impossible, he may, as emphasized by J. G. Parsons, seek to escape it by truancy which begets mischievousness, idleness and even crime. In this connection, however, it is well to quote Walton, who, in writing upon degeneracy and errors of refraction, says: "The subject is of interest to the oculist for two reasons; the socalled stigmata of degeneration include a large number of ocular defects, such as astigmatism and other errors of refraction." "In the second place, it is of practical importance to recognize these signs, since they often indicate the constitution and the character of the individual. For in estimating the relation of eyestrain to headache or other nervous disturbances, it must be remembered that such symptoms may be constitutional as well as reflex." From my own experience in a large reformatory, I would say that the above quotation contains the gist of the subject. There can be no question as to the relatively large number of high degrees of ametropia

in the inmates of such institutions, and also that there is rarely a causative relation between the ocular defect and the moral obliquity.

While extreme moral degeneracy traceable to errors of refraction is without question very rare, we have all met with numerous instances in which a child's irritability, perverseness and apparently pure cussedness have been set aside by the wearing of glasses. A boy with squint will find his deformity the object of the taunts and ridicule of his schoolmates, and according to his temperament it will tend either to make him shy and sensitive or, if he be aggressive, resentful and pugnacious. The effect of such a defect upon a girl is almost certain to make her shy and irresponsive, and may profoundly influence her whole life.

Effect Upon Mental Processes.—We are all familiar with the attempt to prove by analysis of the autobiographic notes of men of genius that their philosophy has been tinctured by physical and mental distress arising from uncorrected errors of refraction. Be this as it may, there can be no question that the person with a high degree of myopia is apt to be introspective and studious because his defective vision deprives him of obtaining his pleasure as do other children, and, as we have seen, internal squint, which in ninety per cent of the cases results from an error of refraction, may greatly modify the disposition of a child.

While we all admit that eyestrain may occasion headache, mental depression and insomnia, few of us could recall cases in which the symptoms have been so profound as to lead to melancholia and suicide. That the sufferings thus produced may terminate in this tragic way is the claim of Pronger, Gould and other writers here and in England.

Epilepsy.—Because of the care that epileptics become to the state, and inasmuch as errors of refraction are considered by some to play a part in its production, it is proper that it should be considered in this paper. That there is not unanimity among observers as to the part played by ametropia in the etiology of epilepsy, is in part due to the obscurity of the pathology of the affection. This has led to confusion in its classification, some authorities considering it merely a symptom of organic disease, others as a functional neurosis.

Authorities could be quoted, pro and con to the point of

weariness, as to the relation of eyestrain to epilepsy. Assuming that there is a reflex form of epilepsy, it is fair to say that there are some conservative ophthalmologists who believe that this may be excited by errors of refraction, their associated muscular anomalies, or both. In 1902 our chairman reported an interesting series in which cures or practical cures resulted from wearing glasses suitable for the existing ametropia and heterophoria. Hansell says that an unbaised opinion, based on an exhaustive analysis of the literature, both from the viewpoint of the ophthalmologist and of the neurologist, expressed tersely would be that "exceptionally the socalled reflex and idiopathic epileptic convulsions may be cured by the correction of ocular anomalies."

Workingmen's Compensation Laws.—As pointed out by Shastid, in consequence of workingmen's compensation laws, which render employers liable for injuries to their workmen, irrespective of technical matters, it is important for him to know to a certainty before he grants employment that the applicant is possessed of sufficient visual power to keep him from being hurt. Visual deficiencies which would jeopardize a man in his employment would usually be due to diseased condition of the media or of the optic nerve, retina or choroid. Refraction errors are less likely to endanger limb or life because the field of vision is not materially contracted and because such errors being usually of a congenital nature the possessor of them has learned in a measure to compensate for them. But there can be no doubt that errors of such a degree as to materially reduce vision and thus require the eye to be brought closer to the work than is usual, would entail danger by bringing the body in proximity to unprotected (but, under natural conditions, safe) parts of machinery.

Safeguarding Entrusted Life.—The danger to the lives of those entrusted to the care of pilots and engineers with visual acuity reduced below a standard based upon the visual requirements of such occupations, makes the detection of the deficiency all important. In many instances this will be found to be due to errors of refraction.

From a consideration of the foregoing, the following suggestions are considered timely:

1. As affections of the eyes that may lead to incurable blindness and consequently to an economic loss and a possible tax

upon the community may have their origin in, or be aggravated by, errors of refraction, such errors when producing symptoms should at once be corrected.

2. That it would aid in the efficiency of labor and prove an economic saving for corporations or others with large office forces to require of applicants for employment an examination of the eyes by a competent ophthalmologist and, where errors of refraction are present of a degree which in his judgment requires correction, to insist upon their correction.

3. That the examination of the eyes of school children should be compulsory by state law (such a law is upon the statute books of but very few states). That such examination should be made in a thorough manner by a competent ophthalmologist and not as is done in most cities by physicians, nurses and teachers, who in a perfunctory manner endeavor to ascertain only the vision, and this under conditions which give entirely untrustworthy results.

4. That it seems possible that certain types of epilepsy may have a reflex ocular origin, therefore this question be made the subject of further careful institutional study.

5. In consequence of the adoption in many of the states, and the probably final adoption in all of the states, of workingmen's compensation laws, it is of the utmost importance to employers to have the eyes of their employes and applicants for positions examined by competent ophthalmologists and, where subnormal visual acuity exists as the result of errors of refraction, to have it brought to normal by the correction of the error.

6. That a campaign of education of the public to the danger of entrusting the examination of the eyes and the treatment of defective vision to those whose only qualification is their assurance, and whose only aim the successful accomplishment of a business transaction, should be inaugurated. That this be done through the columns of such papers as hold the public good above commercialism.

VII.

THE INTRASCLERAL NERVE LOOPS.

By Dr. G. Attias,

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Translated by Clarence Loeb, M. D.,

St. Louis.

In a communication to the Thirtieth Ophthalmological Congress at Heidelberg, Prof. Axenfeld reported a peculiar course of the ciliary nerves in the anterior portion of the bulbus.

It was a case where the nerves, after they had traversed the suprachoroidea and had reached the flat portion of the corpus ciliare, passed perpendicularly through the sclera and frequently touched the conjunctiva, after which they turned, passed through the sclera in the opposite direction, and then spread out in the corpus ciliare. These nerves, therefore, formed a loop in the sclera, and were called intrascleral nerve loops.

Naito,[1] who had worked with Axenfeld, published in the same year a paper upon these intrascleral nerve loops, which he had observed in a case of phthisis bulbi.

They were also found by Fritz,[2] by Groenouw[3] in an eye which was enucleated on account of choroiditis suppurativa, and by Meller[4] in an eye with keratitis disciformis.

Very few cases, therefore, have been published concerning these peculiar nerves.

Axenfeld says nothing concerning the characteristics of these loops, except that they are separate structures, and that only once did he see them in relation to an episcleral nerve branch. The other authors, in their descriptions of their cases, likewise do not state that they saw an anastomosis of the loops with

other nerves, or a division of the loops themselves, during their course through the sclera.

Fritz found that the bend of the loop was formed by a thick layer of connective tissue, rich in nuclei. He claims that he found ganglion cells there also.

The examinations of serial sections which I undertook for the purpose of studying the topography of the nerves in the anterior portion of the bulbus, furnished me with the opportunity of examining three cases of intrascleral nerve loops. The fact that my sections allowed an exact examination of this region and showed a large nerve branch which arose from a loop and extended through the sclera into the cornea, causes me to publish my observations.

Furthermore, I will give a brief description of two structures which resemble nerve loops, in spite of their slight development.

These intrascleral loops of the ciliary nerve are found especially in the superior portion of the eye. But this is not the absolute rule, as Fritz claimed, because in one of the three cases observed by me, the loops were found in the external part of the eye, about the horizontal meridian, under the insertion of the rectus externus. Apparently, Axenfeld saw a case where the loop lay inferiorly.

The distance of the loop from the limbus varied, as does the site of the ciliary nerve's penetration of the corpus ciliare or the sclera. In one of my cases, the loop was 3.5 mm. from the sclerocorneal limbus, and in another, was 1.7 mm.

As far as the loop itself is concerned it can be divided into a proximal and a distal portion. Often a knee and a point can be distinguished. These are shown by my specimens and by the drawings which accompany the articles of Naito and Meller.

The path of the loops seems not to be confined to a perpendicular penetration of the sclera. On the contrary, they often run for a greater or less distance within the scleral fibers, then make a bend (point) and follow the same path to the corpus ciliare.

The examination of the serial sections showed that the part of the loop which lay within the scleral fibers was broadened, so that the loop took the form of a mushroom.

Strange to say, in one of my cases the large branch did not

arise from the point, that is, from the most distal portion of the loop, but arose from a more proximal point. This nerve branch, after it had arisen from the loop, was directed towards the cornea, acting thereafter like the other larger corneal nerves and innervating a portion of the cornea.

The method of differentiation of the loop portion cannot be used for the smaller loops. Twice I saw small intrascleral loops which penetrated the sclera only about 100 micra. The first time, it was a small loop formed of all the fibers of the ciliary nerve. The other time, the loop was formed only from the outer fibers of a ciliary nerve, so that the central fibers (that is, in the direction of the eye) ran almost straight, while the outer fibers passed into the scleral tissue. It seems that these outer fibers have no other use than to fill a space in the sclera which was previously present. Neither of these two structures sent a branch into the scleral tissue. Only the larger of the two was found near a small artery and a small vein.

The smaller loops are more interesting in studying the origin of these structures than the larger ones. However, they seem much less numerous than the larger ones.

Before I begin the histologic description of these interesting structures, I should like to make a statement concerning one of the two structures just mentioned. The larger of them, all of whose fibers penetrated into the sclera to one-fifth of its thickness, was found in an eye which contained another but larger nerve loop. The latter penetrated as far as the episclera, so that the section showed an apparent penetration of the entire sclera by the loop.

Of these two latter structures, the smaller lay above and the larger lay externally, somewhat in front of the insertion of the rectus internus. The presence of two nerve loops in the same bulbus is especially remarkable, because heretofore only one has ever been found in any bulbus.

As has already been stated, an exact histologic description has never been given, especially of the course of the nerve fibers in the scleral loop itself. From a number of cases, which I will not relate individually, I will describe the important agreeing facts, with special attention to the most interesting of my cases, a drawing of which will aid in its better understanding.

When the proximal portion of the nerve has reached the suprachoroidal space, it becomes converted into a ribbon-like structure averaging 50 micra in thickness, except near its entrance into the sclera, where it is 70 micra. It is composed of nerve fibers of 3½ micra thickness and possesses medullary substance throughout. The fibers themselves are somewhat tortuous and run parallel and close to each other, i. e., they cross very rarely. The interruption of the medullary substance does not take place in the same niveau, and the segments themselves are of varying lengths (80-120 micra).

The nuclei, which are found between the fibers, belong to the sheath of Schwann, are almost all of regular oval form, and stain well with nuclear stains, especially hematoxylin.

All the fibers are contained in a sheath of 3 to 4 micra thickness, which can easily be distinguished from the neighboring tissue. It consists of two concentric layers, between which are found the flattened nuclei, which are seen on the inner surface of the sheath. They are somewhat longer than the nuclei of the sheath of Schwann, and are more intensely stained with hematoxylin than are the latter. In comparison to the oval nuclei of the sheath of Schwann, they are very few in number.

As soon as it has entered the sclera, the proximal portion assumes on cross section a rounder form and has a diameter of about 120 micra. The intrascleral portion is surrounded by a sheath, which is somewhat thicker (about 6 micra) than the part just described.

In this portion, also the fibers are all medullated and show the same characteristics as the extrascleral part. However, they are more tortuous and often of a somewhat smaller diameter.

Interesting was the course of the fibers which are found at the knee and the point of the loop, and which are also medullated. They are larger (4 to 5 micra diameter) and are so interwoven with each other that they can scarcely be traced as individuals. In some places they are even knotted, so that the section cuts the fibers now longitudinally and now transversely. Although it is often difficult, and even impossible, to trace these fibers for any distance, I was able to find in some sections that the segments of the medullary sheath were smaller in this portion than in the others.

In the region of the point of the loop, as seen in the drawing, a large branch runs towards the cornea. This branch has a diameter of 20 to 30 micra and contains only medullated fibers. They are constituted exactly like all other nerves in the sclera which run to the cornea. The fibers run parallel to each other and are little if any tortuous.

The distal intrascleral division of the loop shows no special differences from the proximal, except that it is somewhat thinner.

The extrascleral distal division of the loop, also, does not differ materially from the proximal.

A small amount of connective tissue is found between the fibers, and is especially developed between the two arms of the loop.

The presence of ganglion cells in the cap of the loop was not demonstrated by me in my specimens.

There still remains to describe the relation of these nerves to the vessels.

As has been stated, Groenouw, Meller and Fritz observed vessels accompanying these loops. The latter author ascribed to the vessels a great function in the origin of the loops, since according to him they create a path for the passage of the nerves. I would state here that Fritz, Meller and Groenouw found only very small vessels, as far as can be determined from their drawings. The vessel which lay between the arms of the loop in the case of Groenouw had only one-fifth the diameter of the nerve, and seemed to form with it a common structure. It can be considered a true vas nervorum.

I cannot give to these vessels the same importance. In my cases I also could demonstrate the presence of such vessels, either near or in the nerve itself. Only in the case from which the drawing was made was there a rather large vessel (diameter about one-half that of the nerve), which may be seen in cross section near the point of the loop.

In the other two cases, however, the vessels were very thin, and seemed to be bound up with the nerve, and to send small capillaries into the nerve itself. There is quite a difference between these vessels and those which accompany the nerves (for the cornea) in the deeper parts of the sclera, and which often are three or four times as large as the nerve.

In order to obtain a certain explanation for the origin of these peculiar structures, recourse must be had to a thorough embryologic investigation. However, the simplest explanation seems to be that the nerve had grown too long for the bulbus, and consequently a bending of the nerve occurred.

I desire to express my sincerest gratitude to my honored chief, Geheimrath Prof. Dr. Eversbusch, for his kind assistance in this work.

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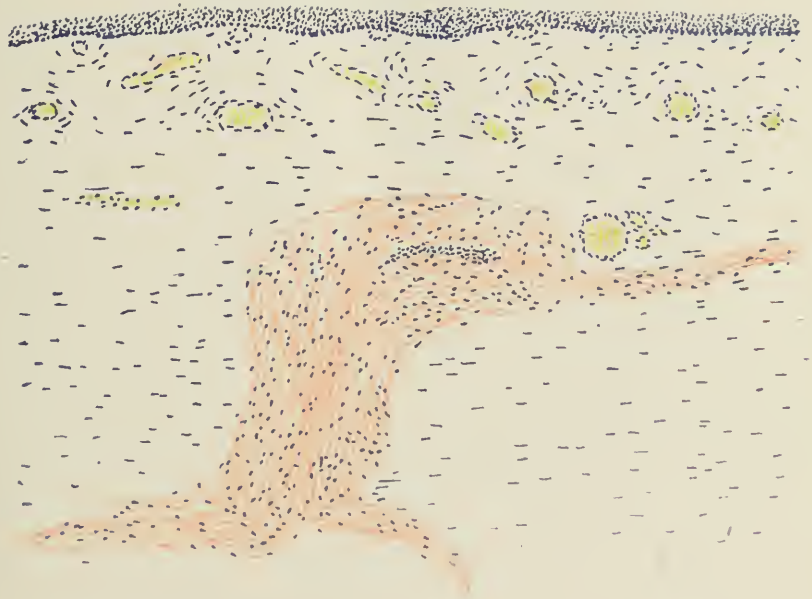

Frozen Section. Sudan III Hematoxylin

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

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Morgagnian Cataract.

CHANCE, BURTON (*Journal of the A. M. A.*, September, 1912). Morgagnian cataracts are not of common occurrence nowadays, owing perhaps to the practice of operation at the stage of maturity; and it may be said that the younger surgeons rarely ever see them. There are indeed but few references to them in the literature of the past ten years. Clinically such cataracts are usually monocular and long-standing. They may be of congenital origin, or secondary to uveal disease. They never remain after traumatism nor after operative procedures. The cortex liquefies so that the nucleus floats more or less freely in the fluid within the capsule, causing

the visual acuity to vary from time to time. The nucleus may remain permanently below the pupillary space and the vision may become restored, and in some cases complete absorption ensues. The author reports two interesting cases from his own practice, describing his operative procedures, with their very satisfying results, and gives valuable directions as to the general surgical management of such cases. He very strongly advises that cataracts should not be allowed to go on to hypermaturity, because of the dangers and complications likely to attend during the operations for their removal. H. G. C.

Sympathetic Choroiditis.

Alt, Adolf (*The Journal of the A. M. A.*, September, 1912), describes a boy, aged nine years, who had been injured four days before he consulted the writer. In spite of treatment the inflammatory reaction was severe, and resulted finally in a hypopyon. Gradually the inflammatory symptoms receded and the eye became somewhat softer. Two months later the patient was again seen, the fellow eye affected, the writer believes, by a sympathetic inflammation. Four and a half months after the injury, and a little over two months after the onset of the sympathetic inflammation, the choroiditis developed. When first seen there were found seven spots, differing in size and appearance, but all uniformly round and sharp in outline. The larger ones had an ivory color; the smaller ones were more yellow, and the smallest ones had a bright golden, shining appearance. We have then, in this case, one of the few hitherto observed cases of characteristic sympathetic choroiditis without a previous cyclitis, and an iritis which was of the mildest type and which never interfered with an ophthalmoscopic examination in the least.

H. G. C.

Sclerosis of the Ligamentum Pectinatum and Its Relation to Glaucoma.

Vertioeff, F. H. (*The Journal of the A. M. A.*, September, 1912), has observed in the pathologic examination of glaucomatous eyes this condition, which seemed of considerable significance in regard to the pathogenesis of glaucoma. He summarizes the findings in ten cases; all in an advanced stage, with deep cupping of the optic disc and marked atrophy of

the retina. The cases seemed to offer to him convincing evidence that the sclerosis of the ligamentum pectinatum that has thus far actually been observed in glaucoma, is not the cause of the latter, but the result of preceding peripheral anterior synechiæ. H. G. G.

The Kronlein Operation as an Exploratory Procedure in Affections of the Orbit.

KNAPP, ARNOLD (*The Journal of the A. M. A.*, September, 1912). The purpose of the writer has been to draw attention to the facility of the osteoplastic resection of the temporal orbital wall, commonly called the Kronlein operation, as an operative procedure, and its adaptability as a diagnostic step to obtain exact information of conditions present in the depth of the orbit, such as morbid processes in the orbital walls, in the optic nerve and in the soft parts. H. G. G.

The Surgical Treatment of Exophthalmus.

TINKER, MARTIN B. (*The Journal of the A. M. A.*, September, 1912) claims that as a rule the extreme bulging of the eye is the most obstinate of the classical symptoms of goiter. For its relief he advises the operation of tarsorraphy, and believes that this in most cases is all that is required. In the treatment of pulsating exophthalmus, ligation of the common carotid should be attempted. The osteoplastic resection of the outer wall of the orbit has perhaps not been as commonly practiced as it should be. This latter operation he describes in detail and claims for it very satisfactory results. H. G. G.

Subconjunctival Injections in Ophthalmic Therapy.

JONES, E. L. (*The Journal of the A. M. A.*, September, 1912), recommends the use of acoin in combination with cyanid of mercury, and claims that although the subsequent appearance of the tissues is sometimes very alarming, no fear need be entertained of serious danger. H. G. G.

Sympathetic Optic Neuritis.

THOMSON, EDGAR S. (*The Journal of the A. M. A.*, September, 1912), describes a male, aged thirty-two years, who in childhood had been struck in the left eye with a stick. At the

time the patient presented himself for examination he had been complaining for the past six months of indefinite pains of a neuralgic character, located in the right temple, accompanied by a decided failure in vision. The blind eye was enucleated two days later and was found to be no more than a string of fibrous tissue. At the end of a week, although no treatment had been administered, the haze of the nerve had almost entirely subsided, the vision had advanced from 10/200 to 15/200, and a little over a month later with a correction equaled 20/100. H. G. G.

Pulvetennlar Ophthalmia and Its Etiology.

Bruns, Henry Dickson (*The Journal of the A. M. A.*, September, 1912), asserts that 30 per cent of his patients of negro blood who consult him are afflicted with this disease. This, as compared with 14 per cent in the whites, is remarkable. In addition, the liability to the disease continues through life up to a greater age in the negro than in the white. He believes that mercury in some form is the only local remedy of any real value. In the causation of the disease he is attracted particularly by the theory which likens it to herpes—to the mild herpes labialis, the fever blister. Their behavior—their sudden unexpected outbreak, their mild and regular course and disappearance without bad effect when uncomplicated—is very similar. He believes the disease should be considered as a neuropathic phenomenon brought about by an autointoxication, originating in the great majority of cases in derangement of the gastrointestinal tract. H. G. G.

Pemphigus of the Conjunctiva.

Wehdler, Walter Baer (*The Journal of the A. M. A.*, September, 1912), reports a case, gives us an historical sketch, and describes the pathology, bacteriology and treatment of the disease. He mentions the other cases reported of this unusual affection. H. G. G.

Removal of the Lens in High Myopia.

Lambert, Walter Eyre (*The Journal of the A. M. A.*, September, 1912), reports uniformly good results from this operation on nine eyes. He claims that the age of the patient is not a contraindication, although needling of the lens followed

by linear extraction is the best in all young subjects. If the patient is fifty years of age or over, and the lens is more or less cataractous, a preliminary iridectomy with subsequent extraction in the usual way, would seem to be the wisest course. He does not regard extensive fundus changes with vitreous opacities, provided that no active inflammatory process is going on, as a contraindication of operation, and cites two of his cases affected thus in which his results were most brilliant.

H. G. G.

Measurement of Fatigue of the Ocular Muscles.

Howe, Lucien (*The Journal of the A. M. A.*, September, 1912), describes the instrument, the methods of its use, its purpose, and concludes that the ergographic method of measuring ocular fatigue gives us entirely new and apparently important data concerning the continued action of different groups of muscles. It shows us for the first time how fatigue occurs under normal conditions—what different types we may expect and what variations are not unusual; resolving the complicated problem which we call "eyestrain" into its different factors.

H. G. G.

Nasal Hydrorrhea—Its Relations to Lesions of the Brain and Visual Apparatus.

Wood, Casey A. (*The Journal of the A. M. A.*, September 1912), reviews three cases of this disease and concludes:

1. That this rare condition is not a definite disease, but merely a symptom of one or more pathologic states.

2. In the majority of cases optic atrophy accompanies or follows the discharge from the nose.

3. The visual involvement is, like the chief nasal symptoms, generally a part of an intracranial disease that underlies the affections of both nose and eyes.

4. The discharge that flows so copiously from the nose is cerebrospinal fluid, and it is just possible that when epiphora accompanies the hydrorrhea the lacrimal discharge may, in part at least, be of the same character.

5. The nasal hydrorrhea usually comes on without apparent reason, is generally intermittent as to amount and time, may disappear for a considerable interval, or may cease entirely as quickly and mysteriously as it came.

6. If there be any organic disease of the nose it is, as a rule, merely a coincidence. Perhaps, however, some of the nasal lesions may be connected with the bony defects or minute fistulas through which the intracranial fluid finds its way into the upper nasal passages.

7. The underlying cerebral disease is frequently some form of hydrocephalus. The intracranial tension due to this disease finds relief by seepage of fluids through one or more nasal openings into the nasal meati or neighboring sinuses.

8. The course of the optic atrophy depends on the character of the brain lesion, and especially on the extent to which the visual centers are involved by the cerebral disease.

9. In every case of nasal hydrorrhea, treatment of the brain alterations should first of all be considered; and, in this connection, lumbar puncture, or some decompression operation, is to be borne in mind. H. G. G.

Tonometry: With Description of a Tonometer.

Gradle, Harry S., Chicago (*Ophthalmic Record,* September 1912). The writer here describes a tonometer which he has devised and which he claims is more practical than the instrument of Schiötz. The footplate of this new instrument is smaller than that of Schiötz, and permits a view of the pupil while the tonometer is being used, and also affords an opportunity of accurately gauging its position on the cornea. The stylet is smaller and is fixed in the instrument, and consequently does not fall out. The weights are all one gram each and pass over the stylet by means of a hole in the center of each. The pointer is fixed, thus obviating the necessity of bending it by hand, as is necessary in the tonometer of Schiötz.

The instrument is made by F. A. Hardy & Company.

O. W.

Hemianopsia of Luetic Origin, With Partial Recovery.

Bruner, William Evans, Cleveland (*Ophthalmic Record,* September, 1912). This case, a man, aged thirty-four years, was first seen by the writer on August 9, 1907. Gave a history of never having had any trouble with his eyes until a few days previously, when he had difficulty in reading the numbers in a telephone book, after an evening spent at the theater. Vision, O. D. 6/6, O. S. 6/9. November 7 ex-

amination with the perimeter showed a small scotoma to the nasal side of fixation in the left eye. Denied venereal history; was a moderate smoker. November 25, right-sided homonymous hemianopsia. Later confessed having had syphilis six years before. Seen on December 11th and 28th, when the scotomas had contracted somewhat. Was placed on mercury in rapidly increasing doses. Was seen at intervals until April, 1912, when he felt well and had no trouble with his eyes. The various examinations made of the eyes showed very little change in vision; at first there was some blurring after reading. A small scotoma is still present in each eye. O W.

Phlyctenular (Eczematous) Conjunctivitis and Keratitis, With Special Reference to Etiology and the Value of Tuberculin as a Diagnostic Agent, Together With the Report of Forty Cases.

Davis, A. Edward, and Vaughan, Harry. This article contains a tabulated report of forty cases of conjunctivitis and keratitis, in which tuberculin was used diagnostically and therapeutically. The cases were under observation for about eight months, and ranged in age from seven months to forty-seven years. The v. Pirquet test was used for diagnostic purposes, and the tubercular bacilli emulsion ("B. E."), human type, serial dilutions (Mulford), was used for the therapeutic injections, beginning with the minimum dose and gradually increasing. Following the v. Pirquet test, twenty-eight reacted positively; twelve did not react. The temperature was elevated in nineteen cases and was lowered in three; unchanged in eighteen. Focal reaction in the eye occurred in three cases. The results of the tuberculin treatment were: Twenty-six cases cured, eight cases improved, one unimproved, five did not return. Tuberculin emulsion was the only internal treatment given in those cases which positively reacted to the v. Pirquet test; local treatment consisted of boric acid drops, yellow oxid of mercury ointment, and in two severe cases, argyrol and atropin. O. W.

Supervised and Systematic Study of Ophthalmology.

Jackson, Edward, Denver. Among the many apt remarks in this paper is one to the effect that there are not enough ophthalmologists to render all the efficient ophthalmic service necessary, no adequate provision to supply them, and no

method of helping people to ascertain who is fairly competent to give such service. To meet this deficiency the writer proposes that those who would take up ophthalmic practice should have, besides the education in general medicine, a knowledge of the minute anatomy of the eye, of the physiology of vision over and above what is usually taught medical students; a course of laboratory work in the pathology and bacteriology of the eye beyond what is usually given in the medical schools; a more extensive knowledge of optics than is necessary for other practitioners; and of methods of examination radically different from those used in other branches of medicine; also skill in delicate operations. He believes that the best method of training for ophthalmic practice will begin with the preliminary education necessary for entrance into the better medical colleges, and a general medical course which should eliminate some of the things not absolutely necessary, such as parts of organic chemistry, materia medica, parts of obstetrics etc. He says the systematic instruction in ophthalmology should include laboratory work in the physiology and pathology of the eye; clinical work in ophthalmology for at least one year; and systematic supervised reading of ophthalmic literature.

O. W.

Keratitis Neuroparalytica After Removal of the Gasserian Ganglion.

Weidler, Walter Baer, New York (*Medical Record* September 14, 1912). Besides history and description of this affection, this paper includes a report of two cases, both women. One, forty-eight years of age, had been treated for "tic" by injections of alcohol and had obtained relief for eight months. Later, had the Gasserian ganglion removed, and three days after the operation was unable to open the right eye. This condition gradually improved, but in about five months an ulcer appeared on the cornea. The eye felt dry and the patient said there were no tears in that eye when she cried. Treatment consisted of boric wash atropin, hot compresses, protargol ointment, and a compress bandage. Arsenious acid was given internally. At this time there was an unusual complication caused by the patient holding her head close to the fire after coming in out of cold. A few days later a sore spot appeared on the forehead above the right eye, which became a neurotrophic ulceration of the scalp. There was loss of sensation for

touch and pain over the greater part of the right side of the face; sensation for cold and heat was intact. Later on, the lids became swollen and the ptosis was about as at first. There was mucopurulent discharge, injection of the conjunctiva: the ulceration of the cornea involved one-half of its diameter, and extended into the stroma. There was iritis and cyclitis; vision was reduced to counting fingers at one foot, and tension was minus one. Seven months later the acute inflammatory symptoms had all subsided, the right side of the face was more sensitive to pain and touch, the ptosis remains, the iris is atrophic, the pupil showing remains of exudate. The injury to the nerves adjacent to the ganglion was the result of an accident, a hook becoming entangled in the sensory nerves during the operation.

In the second case there had been no injection of alcohol; only medical treatment. On March 4, 1909, the Gasserian ganglion was removed, and the pain thus relieved. About seventeen months after the operation the right eye became painful, the lids swollen, free discharge and injection of the bulbar and tarsal conjunctiva. There was central ulceration of the cornea involving two-thirds of it. Vision was reduced to counting fingers at three feet. There was considerable pain in the eye and temple. Treatment was somewhat similar to that of the previous case, and after five months the woman decided to have the eye enucleated.

Macroscopic section of the eye showed the ulcer to have been about 10 mm. in diameter, involving the corneal epithelium, Bowman's membrane and the substantia propria. Microscopic examination showed the corneal epithelial layer normal and intact around the limbus and for about one-fourth of the corneal diameter, the remainder being greatly changed by the ulceration. In the lamina propria near the corneoscleral margin, at one side, are several new blood vessels, and also an invasion of leucocytes. The iris tissue shows foci of round cell infiltrations and loss of pigmentary layer around the pupillary edge. The cellular infiltration had extended to the ciliary body. O. W.

The Treatment of Trachoma With Radium—The Use of Radium-Coated Celluloid Plates for This Purpose.

May, Charles H., New York (*Ophthalmology*, July, 1912), used celluloid plates shaped like the solid blade of an entro-

pion forceps, which were coated on the broad surface with radium bromid, having a radioactivity of 25,000, protected by a layer of waterproof varnish. The broad surface could be applied to the trachomatous surface of either the upper or lower lid, the celluloid acting as a protective shield for the eyeball. With or without previous local anesthesia the instrument was inserted beneath the lid and the radium-covered surface was pressed against the granulations for ten minutes. This proces was repeated upon each lid, thus consuming twenty minutes for the treatment of each eye. In his series the left eye was treated in the usual manner, by way of control. The plates always gave rise to discomfort and some irritation. Fifteen were treated in this way, and the history of each is given. The treatment was continued from six weeks to five months, and was given every two or three days. In no case was the result as good as was obtained with sulphate of copper crystals. A. F. A.

Two Cases of Retinal Detachment in Myopes Cured by Simple Sclerectomy.

Elschnig, Paul, Reubaix (*Ophthalmology*, July, 1912), describes the results of simple sclerectomy upon two patients, both of whom had recent retinal detachment associated with high myopia, and both recovering the vision of the eye from which cases and others like them he concludes that the operation is efficacious from the fact that it does not have to be of the fistulous character, nor even deep; it suffices that it creates bridges of vascularized conjunctival tissue, anastomosing the deep vessels of the pericorneal region and the efferent vessels of the canal of Schlemm with the conjunctival and subconjunctival vessels. Several successive sclerectomies may be done upon the same eye. The bared scleral area is 2 mm. by 10 or 12 mm. The denuded surface is covered by a flap of conjunctiva. A. F. A.

Arteriosclerosis of the Retinal Vessels—(Angiosclerosis).

Oatman, Edward L., New York (*Ophthalmology*, July, 1912). The chief ophthalmoscopic features of vascular degeneration are changes in the color of the vessels, opacities in their walls and abnormal variation in the size of the blood column. In the progress of this disease the first change noticed is dila-

tation, tortuosity and perhaps pulsation of the retinal arteries. Arteriosclerosis shows a preference for the large vessels of the disc, especially the central artery and vein, at their point of bifurcation. Owing to the loss of normal elasticity and contractility in the arterial walls, the arteries become broader, longer and more flaccid, the elongated arteries adapting themselves to their environment by tortuosity. The pulsation is characterized by a slight lateral displacement of the whole vessel, most marked at the bends and curves, and it usually disappears in the later stages of the disease as the vessel walls become more rigid, though it is probable that pulsation was present during the earlier stages. The simple association of tortuous arteries and locomotion pulse are almost pathognomonic of arteriosclerosis. Early relaxation of the arterial walls is manifest in the terminal branches and vascular twigs, which become distended, tortuous, and apparently increased in number. These little vessels are diagnostic and always should be sought for around the macula and disc. The blood pressure is not usually elevated in the early stage of the disease or until the vessel walls become rigid and unyielding. In the early stage the veins show little or no change and are no larger than the arteries—a reversal of the usual relative proportion. The venous distension of late arteriosclerosis extends to the capillaries of the disc, and the latter assumes a dirty, brick red color. Swelling of the intima of the arterial wall is an early stage of the disease. Thinning and distension of the blood vessels in arteriosclerosis is soon arrested by a compensatory proliferation and thickening of the walls. This leads to the stage of rigidity and degeneration. As degeneration progresses the blood vessels become irregularly narrowed. This change is so constant that the ophthalmoscopic picture of attenuated arteries and a red disc is good evidence of arteriosclerosis. Sectional narrowing is common, and well marked collateral circulation is often developed around the constricted section of the vessel. The high blood pressure of advanced arteriosclerosis causes dilatation of the vessel walls at the points not sclerosed. Pulsation at these places is rarely found, but is far more common on the retinal veins than on the arteries. Arteriosclerosis is always accompanied by phlebosclerosis. Evidence of old or new hemorrhages frequently exist near extreme venous constrictions,

and may be the most conspicuous feature of the case. The etiology is unknown. It is but rarely found in early life, and nearly always is present when senility is reached. It is very common among muscular, hard-working people, and more rare among the feeble. It often follows infectious and toxic diseases, and always accompanies chronic nephritis, and frequently diabetes. Whatever produces distension of the arteries, even for repeated short periods, may be productive of vascular disease. The normal increase of the vessel walls of the aged is uniformly distributed as compared with the extremely irregular, exuberant overgrowth of this disease. The functional activity of the retina does not appear to suffer so long as the circulation is not interrupted, but if this interruption occurs, the changes are such as would be associated with impaired nutrition. In advanced arteriosclerosis the adventitia is greatly thickened about the veins and arteries, suggesting the idea that the thickening may be a compensatory change to meet the high blood pressure. Aneurisms are not uncommonly found where the vessels are the least thickened. Degenerative changes follow in the usual order, although the final result of calcification is seldom reached. When present, the calcareous matter is found in the cellular proliferation or in the form of granules scattered through the intima. Loss of vision in arteriosclerosis is usually sudden; though it must be borne in mind that sudden loss of vision may originate not in the retina, but from coincident disease of the cerebral vessels. In the incipient stage of Bright's disease, changes in the smaller retinal vessels frequently antedate the appearance of albumin and casts. A. F. A.

Glaucoma Problems.

Smith, Priestly (*Ophth. Review*, January, 1912). Noncongestive primary glaucoma presents the most difficult problem of all. We know that this innocent looking disorder depends on some hidden change which gradually raises the intraocular pressure, but we do not know with certainty the nature of the initial fault.

First a few words about glaucoma with normal tension. If we agree to use the word "glaucoma" to designate a process depending essentially on excess of pressure in the eye, the idea of a glaucoma without excess is inadmissible, but we may ad-

mit that the excess may be relative rather than absolute. In such a case, though the fault would lie in the weakness of the wall and not in the amount of the pressure, this latter would be relatively too high, and to lower it would be the only way to save the eye. Whether such cases actually occur is doubtful, but we cannot deny the possibility. In presence of an apparent glaucoma without excess of tension, one should always suspect an intermittent excess.

In most cases an excess is discoverable with the tonometer, if not with the finger, at an early stage of the disease, and in the later stages it is usually unmistakable and sometimes great. How does it originate?

Increase of blood pressure appears at first sight to offer a reasonable explanation. Advancing age gives rise to many changes which may in one way or other affect the pressure in the chambers of the eye. These must be severally considered.

During the last three years I have measured the systolic pressure in the radial artery in a number of patients suffering from eye trouble of various kinds—using Leonard Hill's pocket sphygmometer. Among the records I find twenty-eight cases of noncongestive primary glaucoma, and these afford the following figures:

Age: average 61, minimum 41, maximum 73.

Blood pressure: average 153 mm. Hg., minimum 120, maximum 200.

The tension of the eye bore no constant relation to the blood pressure; thus tension normal was noted with a pressure of 180 T. + 2 with 125. These figures prove, if proof be needed, that the relation of chronic glaucoma to senility is not simply a matter of increasing general blood pressure.

An augmented blood pressure in the eye, however, is apparently in some cases an essential factor.

Again, certain cases of chronic glaucoma in one eye only, following slight injury of the head on the same side, may be reasonably ascribed to a slight persistent excess of blood pressure in the eye, depending on nerve lesion. Experiments have proved that the intraocular pressure may be raised considerably by irritation of the sympathetic, and still more by irritation of the trigeminus, the result in each case being probably due to the action of vasodilator fibers.

We must remember that the pressure in the ophthalmic ar-

tery, even at its lowest, is much higher than that in the chambers of the eye, and that if transmitted in full to the intraocular fluid it would involve an intense glaucoma. A loss of tone in the arterioles, therefore, with consequent flushing of the ciliary capillaries, may raise the pressure in the chambers without any general rise of blood pressure.

2. Degenerative changes in the ciliary body may lead, presumably, to excessive exudation into the chambers. It is impossible to measure the output of the intraocular fluid, either in health or disease, but we may appeal again to the analogy of the kidney. Lesion of the secreting tissues of the tubules and glomeruli in chronic nephritis is commonly associated with an excessive production of watery urine, and it is not unreasonable to suppose that degeneration of the capillaries and epithelium of the ciliary body may permit of increased exudation, and thus cause a slight persistent excess of pressure in the chambers of the eye, unaccompanied by nervous disturbance, pain, congestion, or any symptom beyond those which are directly due to the pressure.

Overproduction of the intraocular fluid is at least a possible cause of chronic glaucoma—as suggested long ago by Donders. Of the two underlying causes—vasomotor disturbance and vascular degeneration—the former would be likely to induce a more variable, the latter a more constant, excess in the tension of the eye.

The intraocular fluid when vitiated by addition of albumin, filters less easily from the chambers of the eye. Some forms of cyclitis cause high tension in this way, and it is not unlikely that chronic degeneration of the ciliary body may sometimes have a similar effect.

Skilled analysis of the aqueous taken from glaucomatous eyes lends no support to the idea that chronic glaucoma originates in an altered aqueous fluid. If there be any change of this nature, it is probably rather in the vitreous, for it is the vitreous rather than the aqueous chamber that tends to become too full.

On the whole, there is little evidence that typical chronic glaucoma depends at the outset on vitiation of the intraocular fluid, and against the idea is the fact that the disorder, in many cases, can be arrested for a long while by drainage of the anterior chamber. N. M. B.

Glaucoma Problems—Continued.

Smith, Priestly (*Ophth. Rev.*, March, 1912). 3. Obstructive change in the cribriform ligament is, to say the least, a possible cause. The aqueous filters through the meshes of the ligament to reach Schlemm's canal. If these meshes become unduly small, and there be no corresponding impairment of the secreting organ, the pressure in the chambers will rise.

Here we need consider this theory only in relation to chronic glaucoma. It accords well with the insidious onset, the slow progress, and the noncongestive character of the disease. It accords also with the fact that nothing short of an artificial outlet for the aqueous—a filtering cicatrix—arrests the progress of the disease. But at present it is a theory only.

In any case, the theory of a primary sclerosis of the cribriform ligament seems insufficient. It does not account for the shallowness of the anterior chamber, which commonly increases as the disease progresses and becomes extreme in the final stage, or for the equally characteristic closure of the filtration angle.

4. Closure of the filtration angle is commonly found in eyes blinded by chronic glaucoma when they are ultimately removed for the relief of pain. In a small minority it is absent.

When, many years ago, Leber demonstrated the function of the filtration angle, and Knies and Weber, a little later, pointed to its closure in eyes blinded by glaucoma, the secret of this mysterious malady seemed to have been found at last. But difficulties soon arose. A closed angle was found in eyes which had never been hard; an open one in some which had been blinded by glaucoma.

In some the fluid has probably found an abnormal exit through a fistulous or vascular cicatrix, or pseudocornea. In others its secretion has been arrested through disease of the ciliary body. Evidence of such arrest is seen in abolition of the aqueous chamber, shriveling of the lens, and disappearance of the vitreous, which remains merely as a fibrous cord embedded in the detached and contracted retina. In such eyes, though there is no filtration angle, glaucoma is impossible, for the ciliary body is no longer a secreting organ. In others, again, the iris, though in contact with the cribriform ligament, has suffered no compression and has not seriously interfered with

the access of the aqueous to Schlemm's canal. To this latter point I shall return later.

The second group demands more consideration. These are the eyes which, though blinded by high tension, show an open filtration angle under the microscope. They are of two distinct kinds. In some of them an albuminous fluid unfitted for filtration, and sometimes containing fibrinous deposits, has taken the place of the normal aqueous. In such eyes the anterior chamber is deep and its angle is even wider than in health

An open filtration angle in an eye lost by primary glaucoma is exceptional. Moreover, an angle which is open under the microscope sometimes shows signs of having been closed in the living eye Pigment cells and granules are seen adhering in large numbers to the ligament, and to Descemet's membrane in its immediate neighborhood, where in other cases the iris is adherent. The surfaces have evidently been in contact and have separated. They probably separate when the eye is opened. In eyes with a peripheral adhesion, similar traces of contact and subsequent separation may sometimes be found in the zone adjacent to the adhesion.

Closure of the filtration angle, then, occurs—at some stage—in nearly all cases of unrelieved primary glaucoma, if not in all. Is it the cause of the rise of tension, or is it, as some writers tell us, a nonessential complication? The evidence available is chiefly of the circumstantial kind, but it is very strong.

When we induce such closure artificially in the eye of an animal, all discoverable filtration from the chambers ceases; when we allow the iris to resume its normal position, free filtration is restored. This affords a presumption concerning the causation of glaucoma, but no proof. In order to estimate the importance of the closed angle in glaucoma, we must know at what stage of the disorder it occurs.

Certain forms of secondary glaucoma arise quite obviously through displacement of the iris base—those, for example, which occur with annular posterior synechia, and with choroidal tumor.

Acute primary glaucoma also is associated at its very onset with a similar displacement. It is true that we cannot see the iris base in the living eye, but we can safely infer its contact with the cribriform ligament as an essential part of the attack. Let treatment be delayed, and it will soon become fixed in this

position by adhesion. Let timely relief be given, and the closed angle will reopen and resume its function.

The relation of chronic glaucoma to closure of the filtration angle is much less obvious. The evidence seems, at first sight, to point both ways. On the one hand, a peripheral adhesion of the iris is almost always present in the final stage. It appears to arise in nearly the same way as in acute glaucoma, the iris base being carried forward by the ciliary processes. In the final stage, if not earlier, the chronic disorder, like the acute, commonly shows a marked shallowing of the anterior chamber.

On the other hand, the anterior chamber in chronic glaucoma is not always shallow, and even when the disorder is far advanced the pupil is often active. How, it may be urged, can these conditions be reconciled with the idea of a closed filtration angle?

The objection when examined has no great weight. The depth of the chamber in its visible part is no sure guide to the patency of the invisible periphery.

Again, activity of the pupil is no proof that the angle of the chamber is normally patent. In acute glaucoma there is severe compression of the iris base, resulting, unless relief be given speedily, in paralysis of the iris muscles, serous exudation, and adhesion. But even then the sphincter may remain amenable to myotics for some days at least. In chronic glaucoma there is certainly little if any compression of the iris at the beginning, or we should have pain and visible congestion, but there may be contact between the anterior surface of the iris and the cribriform ligament. In the case of an open spongy tissue like that of the iris, contact does not necessarily involve compression of the contained vessels. The dilator fibers lie near to the posterior surface; the sphincter lies in an unaffected zone. So long as there is no compression sufficient to obstruct the circulation or paralyze the nerves, there seems to be no reason why the pupil should not act.

A recent research by Fuchs is of great importance in this connection. That contact of the iris without compression does not necessarily shut off the aqueous from the ligament and Schlemm's canal. This simplifies the problem of chronic glaucoma.

In seeking to explain the essential nature of chronic glaucoma we have discussed several possible causes, and it seem

likely that every possible cause is sometimes the actual cause, but when we look at the matter all round, no explanation seems to fit the average case so well as this. Chronic glaucoma may be reasonably attributed from the outset to a displacement of the iris—and thus brought into line with the acute disorder. Slight contact between the iris and cribriform ligament, with little or no compression, will account for the doubtful and variable excess of tension which characterizes the early stage. It is compatible with activity of the pupil and with freedom from pain and congestion. It accords with the shallowness of the chamber common in these eyes. A slowly increasing compression of the iris base will explain the gradual excess of higher tension, the formation of a peripheral adhesion, and the ultimate outbreak of pain and vascular congestion. That an adhesion should occasionally fail to form, or that it should give way when the eye is opened, is not surprising.

But this, if true, is only a partial explanation. It tells us only the proximate cause of the increased pressure in the chamber. We have still to ask what it is that brings the iris into this dangerous position. N. M. B.

Glaucoma Problems—Continued.

Smith, Priestly (*Ophth. Rev.*, May, 1912). Having during the last two years gone over much of the old ground again, with the help of fresh material and better methods, including photography, I am myself more firmly convinced than ever of the importance of the closed filtration angle, and of its dependence in primary glaucoma on changes in the shape and position of the ciliary processes and lens.

The position of the ciliary processes is under the influence of several factors. It varies, as is well known, with the shape of the ciliary muscle; it is affected by the amount of blood in the ciliary vessels; it is controlled by the tension of the zonule. When the processes increase in bulk, by reason of vascular congestion, their apices move forwards and inwards. When the lens and zonule advance the processes are drawn forwards with them. In either case, and still more when the two changes occur together, the base of the iris is carried forwards. If the displacement be sufficient to interfere with the escape of the aqueous, glaucoma follows. The evidence which points to this conclusion needs careful consideration.

Unfortunately neither the processes nor the iris base can be seen in the living eye, and by no possible method can we bring them into view without in some degree disturbing their relations: for vascular tissues shrink when their blood escapes, and parts which have been displaced by pressure tend to recover their natural positions when the pressure is removed. In the study of glaucoma due allowance must be made for these inevitable changes or the microscope may easily mislead. Consider what happens to a glaucomatous eye during its passage from the orbit to the field of the microscope.

If true conclusions are to be reached these various difficulties must be taken into account and obviated as far as possible.

Then followed a description of the methods used by the author in preparation of the excised eye for microscopic examination.

In addition to the changes which take place in the eye after its removal from the orbit, the atrophy which occurs in the later stages of glaucoma must be taken into account. Especially in chronic glaucoma of long standing the ciliary body is often much atrophied, both muscle and processes being reduced in bulk. Their relation to the iris is altered thereby.

Reports of cases with photograph of microscopic findings follow, tending to show how the iris base is brought into contact with the cribriform ligament in chronic glaucoma

N. M. B.

Glaucoma Problems—Continued.

Smith, Priestly (*Ophth. Rev.*, July, 1912). The specimens show that as regards the characteristic changes at the filtration angle, chronic and acute glaucoma are much alike. The resemblance, to say the least of it, affords a strong presumption that the two forms are essentially of one nature, and that an obstructive displacement of the iris is the proximate cause of both.

To account for the early occurrence of the compression in the one case and its long absence in the other we must look to the nature of the initial causes. Acute glaucoma, as we have seen, commonly arises through some disturbance which causes congestion of the head and eyes. The processes grow turgid, the space at their disposal is insufficient, and they press the iris against the cribriform ligament. The initial disturbance

may be trivial, but no sooner is the filtration angle blocked than the rising pressure in the chambers hinders the circulation in the uveal tract and increases its congestion. The vascular congestion and the obstruction at the filtration angle thus act in a vicious circle and intensify each other. In this way an acute glaucoma may be rapidly established in an eye which had previously appeared quite healthy.

Chronic glaucoma, on the other hand, commonly begins without obvious disturbance of any kind, and may even reach an advanced stage, with deep cupping of the disc and much narrowing of the field, before the patient notices that anything is going wrong; for there is neither pain nor redness to draw attention to it. Here there is little or no evidence of an initial vascular disturbance, and if there be displacement of the iris in the early stage, it must be due to something other than swelling of the ciliary processes. This other something is probably to be found in the changing relations of the lens.

Typical chronic glaucoma usually depends on slowly increasing contact of the iris with the cribriform ligament, arising through enlargement or advance of the lens, and involving in its early stages no serious compression of the iris. This is followed by an analysis of the characteristic feature of the disease.

In the final stage of chronic glaucoma, perhaps after years of painless blindness, pain and congestion usually supervene. The cause is probably an increased compression of the iris between the processes and the cribriform ligament, and sometimes even between the lens and the cornea.

It is a significant fact that chronic, like acute glaucoma, shows a predilection for small eyes. Smallness of the eye, be it noted, is not an ever present factor in primary glaucoma, for eyes of average and more than average size are sometimes attacked, but it is a determining factor in a considerable number of cases, and must be taken into account in any complete explanation of the disease. The special liability of these small eyes probably depends on the relations of the lens to the parts around it.

The explanation of chronic glaucoma here given appears then to accord well with the clinical and anatomic features of the disease, and indeed to be the only one which fits them. The contrast between chronic and acute glaucoma, when we take

typical examples, is so strongly marked that some writers have declared them to be of essentially different nature, but the foregoing considerations point to a close though hidden resemblance. In both we find the predilection for small eyes; in both the obstructive displacement of the iris—slowly established in the one case, rapidly in the other; moreover, though the extremes are so widely different, there are many cases which seem to be intermediate—cases which present, together with the usual symptoms of chronic glaucoma, occasional rainbow rings or periods of slight injection arising under circumstances which in other eyes provoke acute attacks. The two forms cannot be absolutely separated.

The causation of chronic glaucoma is no doubt complex. In some cases the anatomic factors described above would appear to afford a complete explanation, while in others we may reasonably assume the concurrence of vascular, secretory, or degenerative changes. The possible causes, as we have seen, are many, and it is likely that every possible cause is sometimes an actual cause. N. M. B.

Glaucoma Problems—Continued.

Smith, Priestly (*Ophth. Rev.*, October, 1912). Primary glaucoma sometimes occurs in several members of one family, appearing in two or more succeeding generations and in two or more members of one generation. Evidently a special liability to it may be inherited. An analysis of the available evidence on this point, including five instances observed by himself, was made not long ago by Lawford, and the following facts may be regarded as well established: Hereditary primary glaucoma is usually continuous in its descent, not skipping a generation and reappearing in the next. It frequently exhibits the phenomenon of "anticipation," appearing at an earlier age in the younger generation than it had done in the older. It occurs both in the acute and in the chronic form. It may be transmitted by either sex and inherited by either sex.

The causation in the individual appears to be often complex, embracing several factors; it is likely therefore that the transmitted factor is not the same in all glaucoma pedigrees. In some, conceivably, it may be a special tendency to vascular or nerve disorder, in others a fault in the development or growth of the eye. This latter supposition deserves particular atten-

tion because it is one which can be accurately investigated, and because some evidence in its favor can already be given.

We know that there is a correlation between liability to glaucoma and imperfect growth of the eye.

Then follows the report of three instances in which hereditary glaucoma was associated with well marked smallness of the cornea. Certainly the cornea should be measured in all cases where heredity is discovered. But we might well go further. I venture to suggest that it would be worth while to measure and record the size of the cornea as a matter of routine in all cases of primary glaucoma. It is sufficient to measure the horizontal diameter and this can be easily and quickly done.

In a certain number it will be found to be abnormally small, viz., 10.5 mm. or less. (Among 112 consecutive glaucoma patients measured some years ago, I found it so in 22 per cent, whereas among 500 unaffected persons it was so in less than 2 per cent.) In the remainder it will be of ordinary size, viz. 11, 11.5, or 12 mm.; rarely, as among unaffected eyes, it may be a little larger still. We may speak of the former as the small-eyed cases. The crucial question is this: Is heredity discoverable in a larger proportion of the small-eyed cases than among the others? An answer can be obtained without examination of affected relatives, and when based on sufficient numbers will show whether smallness of the cornea is a usual or only an exceptional concomitant of hereditary glaucoma.

The matter has more than a scientific interest. Suppose that a patient suffering from primary glaucoma is found to have small corneas. To trace the defect back to one of his parents may be impossible, but to ascertain whether he has transmitted it to one or more of his children may be easy, even though they be still young, for the cornea attains its full diameter before the tenth year. Smallness of the cornea found under such circumstances would be of evil augury.

Great caution would be needed in making such observations. Even to hint at an inherited liability to the disease without good reason would be cruel. But foreknowledge of it, properly employed, might sometimes be most valuable, ensuring a person against neglect or improper treatment should trouble actually arise. On the other hand, one who dreaded the family disorder but who had not inherited the corneal defect might reasonably be reassured.

Questions of human heredity always need delicate handling, but if we are to touch them at all we can hardly study them too closely.

In connection with the present inquiry it is important to note that the size of the cornea bears no special relation to the refraction of the eye. In hypermetropia, emmetropia, and myopia the average diameter of the cornea is the same, and this is true even of high degrees of H. and M. A small eye whose proportions throughout are the same as those of a full sized emmetropic eye will be emmetropic however small it may be. Hypermetropia is a sign of disproportion somewhere; the eye as a whole may or may not be small. Should it be proved that hereditary glaucoma is specially connected with smallness of the eyes, a connection with hypermetropia will be neither proved nor disproved thereby.

This is followed by a description of the keratometer used in measuring the size of cornea. The scale is engraved on a strip of white opaque glass and this is cemented to the plane surface of the lens. The scale has a length of 13 mm. and the lens a power of 4 D. The observer places the keratometer in the ordinary trial frame before the patient's eye, or holds it in that position. Keeping his own eye about ten inches (25 cm.) away, he gets the patient to look at him steadily, brings the zero of the scale over one margin of the cornea and reads the position of the other without difficulty, to half a millimeter.

N. M. B.

A Safety Device for Dangerous Cataract Extractions.

Maddox, Ernest E. (*Ophth. Review*, January, 1912) suggests the following device in cataract operations upon incorrigible "squeezers":

By few surgeons must the extraction of cataract from an incorrigible "squeezer" be anticipated with much pleasure.

A means of distinctly lessening the danger, therefore, as narrated in the following case, seems sufficiently valuable to communicate. The patient was a very high myope, whose preliminary iridectomy had the advantage of revealing the proclivity of her orbicularis. Its powerful and repeated spasm made even the admission of the speculum a matter of considerable difficulty, and it became evident that the extraction of the cataract later would be extremely hazardous, unless some

means were employed of preventing expulsion of vitreous. And hazardous indeed it proved, when the time came, for after inserting the speculum for the second operation, the eyeball was churned up into a highly congested condition by the frequent and powerful spasms of the eyelids. A soft but strong suture, armed with a needle at one end, was passed upwards through a short vertical tunnel of the conjunctiva, below the inferior limbus, then through a short tunnel parallel with and close to the upper part of the limbus, and again through a second vertical tunnel parallel with the first and about one-eighth inch away from it, and its extremities placed within the grip of a "serre-fine."

The double thread which thus came to lie on the cornea was then displaced toward the outer canthus, so as to leave the cornea quite clear for the knife.

The incision was made in the ordinary manner, but emerging slightly on the corneal side of the superior limbus to avoid any danger of cutting the suture. Just after the edge of the knife began to turn forward, and before cutting its way quite out, the suture, just then transferred to the surgeon's left hand by an assistant, was drawn tight, so as to follow the back of the knife and secure the cornea at the first critical moment of the knife's emergence. While still held thus, the cystotome could be used with safety; and the thread then being slightly loosened allowed the lens to be expressed during a happy moment of calm, while keeping just sufficient guard upon it to prevent it being followed by any sudden extrusion of vitreous.

N. M. B.

An Operation for Conical Cornea.

Maddox, Ernest E. (*Ophth. Review*, February, 1912). The brilliant results with which the practice of Bader's method of excising a small elliptical piece of the cornea for keratoconus has rewarded a few operators, make it a matter of regret that this operation should have fallen into so much disuse through the danger of panophthalmitis, and that it should have to be replaced by the safe, but less effective procedure of thermocauterization.

Wishing to try the elliptical flap, without running the risk of disaster, on a patient whose other eye had been considerably improved by the thermocautery, I proceeded as follows:

After transfixing the cornea with a narrow tapering Graefe's knife and removing the ellipse by knife and scissors, the margins were united by a single exceedingly fine suture, which only involved about the outer half of the substantia propria, after the manner of Kalt and Angelucci. A large broad tongue of conjunctiva was now detached from the lower part of the globe and drawn up to nearly reach the superior limbus by one or two sutures running over the upper part of the cornea towards the insertion of the superior rectus. The margins of this tongue at the same level as the excised ellipse were then sutured with very fine silk towards the conjunctiva of the inner and outer limbus. These fine sutures gave way in a day or two, but the superior ones, being of soft and thick silk, retained their hold for a week, after which the conjunctiva sank back, and happening to attach itself to the inferior limbus as it should, no adjustment was necessary. The corneal suture fell out of itself after the healing was complete.

The eye was weak and watery for several weeks, though at no time was there the slightest iritis, or even sluggishness of the iris or k. p. Whether the long convalescence was due to conjunctival disarrangement, or whether it would have occurred in any case, is not easy to say. The ultimate vision was decidedly superior to that of the other eye, though the keratoconus was originally greater. N. M. B.

Ptosis Operations.

Fergus, A. Freeland (*Ophth. Rev.*, February, 1912). The operation consists in the resection of the tarsus and in stitching the border of the resected tarsus right up to the strong fibrous continuation of the frontal part of the occipitofrontalis. In suitable cases this method of operation gives a good result. The only patients for whom it is not adapted are those in whom there seems to be a congenital absence or want of development of the frontal muscle. Whether that muscle is absent or present in sufficient strength is easily determined by asking the patient to wrinkle his or her eyebrows, while at the same time the parts are palpated.

Skin incision is made right across the eyelid, parallel with and a few millimeters above the margin. Another incision is made in the following manner: It begins at one end of the

primary incision and curves upward over the eyelid, and then downwards so as to terminate at the other end of the same incision. Almost the entire skin of the eyelid proper is included between these two incisions. The integument thus marked off is dissected up and then removed, as also is all the tissue down to the tarsus. So soon as the tarsus is thus laid bare, I make an incision parallel with the edge of the eyelid and a little above the primary skin incision. This incision is carried through the tarsus and even through the conjunctiva, the eyeball being protected by means of a metal spatula. I then feel for the superior border of the tarsus and carry an incision right through the tarsus there, also parallel in direction with the margin of the eyelid. Two short vertical incisions, one at either end, are then made, and thus a horizontal oblong of the tarsus is marked off and removed.

The edge of that portion of the tarsus which still remains near its margin is stitched right up to the strong fascia which comes down from the frontal muscle; it is attached to it by three points of the suture made with absorbent catgut. Then the edges of the skin wound are brought together by means of silk sutures. The operation is easily performed and seems to give much better results than the operation of advancement of the frontal muscle, which was described some years ago.

N. M. B.

A Contribution to the Study of Anomalies of the Lacrimal Sac and Fossa.

Kaz, Raphael (*Ophth. Rec.*, February, 1912), describes an anomaly of the lacrimal sac which appears to have been a cyst of the wall of the sac resulting from a diverticulum which ultimately became closed off from the sac itself following inflammatory reaction.

N. M. B.

A Case of Congenital Deficiency of Cilia and Intermarginal Area of Both Lower Lids With Distichiasis.

Traquair, H. M. (*Ophth. Rec.*, May, 1912). Put shortly, the conditions present constituted almost complete absence of cilia and intermarginal zone together with a minimal degree of distichiasis in both lower lids.

The upper lids were well developed and no other abnormalities were present.

Inspection of the eyes of the patient's father showed a similar condition, only less marked. On the lower lids the cilia and intermarginal zones were only just visible to the naked eye. No obvious distichiasis was noticeable, but some conjunctival hyperemia and slight photophobia were present. N. M. B.

Congenital Ptosis With Associated Lid Movements of the Affected Eye.

Thomson, J. E. G., and Souther, W. C. (*Ophth. Rev.*, June, 1912), report a case of congenital ptosis in a girl of nine with lid movements of the affected eye associated with movements of the jaw. A detailed description is given and several photographs reproduced. N. M. B.

A Case of the Stephenson Type of Oculomotor Polioencephalitis.

Kaz, Raphael (*Ophth. Rev.*, June, 1912). In *La Clinique Ophtalmologique*, November, 1911, Mr. Sydney Stephenson states that the form of paralytic squint which occurs suddenly in young children, either without known cause or after some general disease, is really a manifestation of polioencephalitis in an oculomotor form.

Kaz does not think that a polioencephalitis can be assumed to be present in every infantile paralytic squint, nor does he understand why an infectious disease such as diphtheria, should not directly affect the extraocular as well as the intraocular muscles without the necessity of assuming an intermediate polioencephalitis.

Two cases are reported which lead the author to think that Stephenson's hypothesis is frequently correct.

It is evident that in both cases there was the same underlying polioencephalitis, the cerebral form of socalled infantile paralysis, which in the one case appeared in its ordinary form affecting the muscles of the extremity, in the other in the form of a paralysis of the external ocular muscle. N. M. B.

A New Mode of Measuring Muscle Balance.

Maddox, Ernest E. (*Ophth. Rev.*, June, 1912). The following test for the ocular muscles, though as simple as the glass rod, is so far supplementary to it as to be able to measure cyclophoria and all other deviations in near vision, simul-

taneously. It also reveals in some people the difference between the physiologic and geometric quadranture of the retina which was indicated by Helmholtz, though doubted by more modern authorities.

The new test requires only two small sheets of celluloid, of complementary colors, such as green and red, and capable of being held together and gliding over one another. Each sheet is perforated with a suitable pattern, so that on holding the combination up to the sky the perforations in each are illuminated and colored by the other, the background remaining dark, since almost no light passes through both colors.

On looking at these patterns through the spectacles provided for Snellen's "Friend" test, the eyes are dissociated, and the patient, by gliding one celluloid over the other, attempts to set the two patterns in their original true relation to each other. The surgeon can meanwhile watch with interest how the two patterns gradually separate and rotate, reproducing exactly as they do so, the increasing displacement of the patient's eyes. The two sheets are now gripped by an ordinary letter clip, which preserves their relation and enables the various deviations to be examined and measured at leisure.

Since this test works by the movement of objects instead of the movement of images, therein differing from previous tests by prisms, rods, or neutralizing colors, the patterns are displaced in the same direction as the eye that sees them, instead of in the opposite direction, like the images in other tests

N. M. B.

Colobomata of the Eye.

Hird, Bevtson R. (*Ophth. Rev.*, June, 1912). The number of cases I have to report are sixteen, many of them presenting peculiarities in appearance and position.

Before giving a summary of my cases I would like to make a few definite statements concerning them to save unnecessary repetition.

(1) In none of my cases was I able to trace any sign of heredity. Although several came of large families, none were similarly affected.

(2) I saw the mother whenever possible. In no case, as far as I could ascertain, had she suffered from any definite intrauterine inflammation, nor had she had any definite disease of a febrile nature during the pregnancy.

(3) In no case was there any positive evidence of syphilis in either parent or congenital in the colobomatous patient. The following were my cases.

Then follows reports of cases in full.

In the series of cases twenty-six eyes were colobomatous and where the refraction could be ascertained presented the following varieties of error:

Simple Hypermetropia	2 cases
Hypermetropic Astigmatism	8 cases
Mixed Astigmatism	3 cases
Simple Myopia	8 cases
Myopic Astigmatism	2 cases

They were evenly divided then between hypermetropia and myopia, and astigmatism only slightly predominated. The visual acuity was, as a rule, defective in the colobomatous eye.

One would naturally expect the visual field to be deficient in those eyes presenting a coloboma of the choroid and retina, as well as those involving the optic nerve. An amblyopic area corresponding in shape to the coloboma should be present if the retina were absent or too ill-developed to functionate. I was unable to take the visual fields in all my patients, for some were too young. The fields were taken with a perimeter in ten cases with the following results:

Slight general contraction of the fields in	2 cases
Marked general contraction of the fields in	2 cases
Definite notch in field corresponding to coloboma	3 cases
Contraction of the field corresponding to coloboma	1 case
Field full and normal	2 cases

Many authorities have reported the presence of other developmental defects in cases of ocular colobomata. With regard to my own cases the following conditions were present:

Nystagmus in	2 cases
Convergent strabismus in	2 cases
Microphthalmos in	1 case
Absence of the right external ear and hemiatrophy of the right face	1 case
Opacities in the lens in	2 cases

In no case were any remains of the pupillary membrane to be seen. N. M. B.

Colobomata of the Eye.

Hird, R. B. (*Ophth. Rev.*, August, 1912). Etiology.—(1) Sex. There appears to be no marked incidence of colobomata in either sex.

(2) Heredity. Quite a number of cases have been reported occurring in families.

(3) Maternal Shock. Treacher Collins, in discussing the primary cause of ocular abnormalities, states that he found in twelve cases some mental impression, or fright was said to have occurred during pregnancy. In six cases it occurred during the first month and may therefore, he thinks, be reasonably regarded as a disturbing agent.

Parsons says that if we grant that the colobomata are due to arrested or defective closure of the fetal cleft, there still remains the question of the mechanism whereby this is brought about, and the following theories, have been advanced:

(1) The mesoblastic theory, that the seat of the mischief is in the mesoblast, whether consisting of over or under development.

(2) The retinal theory, that the primary seat is in the retina, which proliferates unduly.

(3) The lenticular theory, that closure is prevented by relative abnormal development of the lens as compared with the size of the eye.

What explanation have we for the atypical colobomata, viz., those abnormally situated, when regarded from the point of view of maldevelopment? We are indebted to v. Ammon, who discovered an atypical subsidiary fetal cleft in animals. Others have confirmed this, including Van Duyse, who has described a double fetal cleft in a calf embryo.

Coloboma of the Iris.—This is by far the commonest and usually situated downwards and inwards, giving rise to a keyhole or pear shaped pupil.

In discussing the theories of causation of coloboma and aniridia, he says the only ones worthy of consideration are those which presume an obstacle to the ingrowth of the iris from the periphery, which normally occurs at the fourth month.

Four hypotheses have to be considered, and Coats gives an excellent summary of these. Briefly they are as follows:

(1) Hypothesis of Manz. This assumes that the lens remains unduly long in contact with the cornea while the eye is

developing, and so hinders the iris from growing in. In double coloboma of the iris this would have to take place in two spots, a point difficult to comprehend.

(2) That the mesoblast fails to separate properly into cornea and iris, so that the iris is never differentiated and cannot grow inwards.

(3) Hypothesis of Treacher Collins. That the fibrovascular sheath remains adherent to the anterior lens capsule and so prevents the ingrowth of the iris.

(4) Hypothesis of Hess. In normal circumstances the mesoblast of the fibrovascular sheath passes round the anterior edge of the secondary optic vesicle and becomes continuous with the mesoblast from which the iris is to develop, and from which the pupillary membrane springs. Should this tissue, or a strand of it connected with some particular vessel, be unusually dense and unyielding, both the optic vesicle and the mesoblast which should form the iris will be prevented from growing inwards, and aniridia or a coloboma will result. It is not mere persistence of the mesoblast which prevents the ingrowth of the iris, since even normally it persists till late in fetal life; but in ordinary development it yields to the growing iris and follows it inwards over the lens. N. M B.

Couching.

Elliot, R. H. (*Ophth. Rev.*, September, 1912). In the *Indian Medical Gazette* of August, 1906, I published a review of 125 cases of couching of the lens by native practitioners or vydyans. Since then we have accumulated another 425 cases, giving a total of 550 in all, and my old pupil, Dr. Ekambaram, has published a full description of the methods of vydyans as actually witnessed by himself.

It is interesting to note that the methods observed by Colonel Drake-Brockman in other parts of India tally closely with those described by Ekambaram in southern India.

It is perhaps difficult to form an accurate opinion as to how far the figures before us represent the best results attained by the coucher. His apologists might urge that only his failures would come to English hospitals. On the other hand, there can be little doubt that quite a considerable number of eyes are lost, after couching, from panophthalmitis and phthisis bulbi. Patients in such a condition will often stay away from hospital,

owing to the very hopelessness of their condition, and even if they do resort to English treatment, they will stoutly deny that their eyes have been interfered with.

Only 0.82 per cent were seen within the first month, and only 17.88 per cent within the first six months. The following six months added only 5.65 per cent. The great mass of the cases had been operated on from one to ten years previous to being seen. This in itself would indicate that the cases from which our observations were made, were drawn from the mass of the people rather than from the coucher's failures alone.

Only 4.94 per cent of the total number of cases lie below the age of thirty-six, and nearly 60 per cent lie between the ages of forty and sixty. This is in accordance with what we know of senile cataract in India. Of the fourteen cases which show an age of thirty or below, eight may be excluded as having probably given their ages too low.

No table is more interesting than that which gives the state of vision when the patients came under observation. In only 10.59 per cent was the vision 1/3 and upward. In another 11.05 per cent the vision was 1/4 to 1/10, in 9.04 per cent it was 1/10 to 1/50, and in 7.05 per cent it was the finger count at two feet or less. The figures given refer in each case to the vision corrected with lenses. If every case that got a vision of 1/10 and upward be considered a success, the coucher can claim 21.64 per cent. Again, if anything from 1/10 vision to the ability to count fingers close to face be counted as partial success, the figure for this class is 16.69 per cent. This is very much more liberal treatment than would be accorded to the cataract statistics of any modern surgeon.

A further light is shown on the above figures by a study of the table showing the duration of vision after couching. Of the forty-five successful cases, twenty-three of them, or more than 50 per cent, had been couched less than two years before. Nine more had been couched between two and three years, and eleven from three to ten years. In two, this detail was unmarked. The great preponderance of short histories in the cases of successful operation is significant.

The table showing the causes of failure will repay a careful study. The figure for iritis and iridocyclitis comes to 35.76 per cent of the total number of cases; glaucoma accounts for 11.05 per cent, imperfect dislocation of the lens for 8.94 per

cent, retinal detachment for 3.53 per cent, optic atrophy (including one case of optic neuritis supervening as a septic complication of the operation) for 2.59 per cent, retinitis pigmentosa and retinitis punctata albescens for 0.49 per cent, retinochoroiditis for 1.41 per cent, vitreous opacities for 1.18 per cent, failure due to operation on a congenitally imperfect eye for 0.23 per cent, and 3.53 per cent are unfortunately unaccounted for, owing to deficiencies in the notes.

It has from time to time been suggested that the presence of the lens in the vitreous chamber brings about retinal changes. I am not, however, aware of any reliable evidence, either ophthalmoscopic or pathologic, to support this view.

It has taken a period of over eight years to collect the records of these 550 cases. I have throughout these years kept one definite purpose in front of me, viz., to ascertain the real value of lens couching. The more I have studied the subject, the more convinced have I become that the coucher is a standing menace to society and that he should be dealt with by removal. He is an unprincipled charlatan; his methods are crude, filthy and dangerous; his results are so appalling that any one unacquainted with the ignorance and credulity of the Indian ryot would think it impossible for him to continue to exist. His impudent lying includes not merely a grossly exaggerated statement of his own successes, but extends to the most barefaced falsehoods as to the nature of the results obtained in European hospitals.

There is no branch of ophthalmic disease and treatment which has so profoundly impressed my imagination as this one. Remember that in India cataract strikes a man down in his maturity, at a period of his life when he has begun to reap the benefit of his earlier years of toilsome industry. His pay and his home expenses are both alike at their maximum. He is treading the higher rungs of the official or business ladder, and is endeavoring to afford his children the best education in his power. Few pictures are more pitiful than that of such a man passing hopefully down an avenue of credulity and ignorance to a fate to which death itself is often preferred, the horror of a great and life long darkness.

My motive in reading this paper is to arouse the medical conscience of the country through yourselves. I wish to start you and your medical brethren thinking again of the evils I am

deploring; to introduce a ferment, as it were, into the medical mind of India and then to leave it to do its work. I do not for a moment think that the country is ripe for legislation on such a subject. The people are not ready for it. There are, however, two distinct avenues along which we may safely advance, viz., (1) the systematic dissemination of knowledge through government agencies amongst the people, and (2) the improvement of ophthalmic medical education. I have weighed this advice well before I ventured to give it. N. M. B.

Hydatid Cyst of the Orbit.

Tooley, G. H. (*Ophth. Rec.*, September, 1912), reports in detail two operations upon the same patient: This case occurs in a young male subject, as is most common in orbital hydatids. The first cyst was intermuscular, the later cysts expanded the bone in which, or the periosteum, they must, I think, have commenced. They were probably present when I operated the first time, but so small that I did not detect them.

N. M. B.

The Value of the "Direct Smear" in the Bacteriology of Conjunctivitis, With Analysis of a Thousand Cases.

Browning, S. H. (*Ophth. Rec.*, April, 1912). To those ophthalmologists who have not at hand the conveniences of a laboratory, with culture media and incubators, etc., the following statistics, derived from 1 000 consecutive cases of conjunctivitis, may be of interest. The results indicate the amount of reliance to be placed on smear preparations when cultivations cannot be made. All these cases were examined by direct smears made on slides, and at the same time cultures were made on suitable media. The clinical diagnosis was not made in many of the cases by the surgeon until the bacteriologic findings were reported, so that it has been impossible to compare the clinical diagnosis with the organism found on bacteriologic investigation. In the cases of ulceration of the cornea which are included in this list where possible the smears and cultures were made from scrapings from the edge of the ulcer. I do not in any way wish to suggest that cultivations should not always be made where possible, as this is absolutely essential for the confirmation of the presumptive diagnosis made from the direct smear.

The following table shows the percentage of cases in which the organism was found in the direct smear and subsequently confirmed by culture:

TABLE I.

Organism.	Presumptive Diagnosis.	Presumptive diagnosis confirmed.
Gonococcus	86.5%	59.4%
B. Lacunatus (Morax)	59.4%	32.6%
B. Egypticus (Koch-Weeks bacillus)	86.0%	41.2%
Pneumococcus	60.0%	45.3%
B. diphtheriæ	61.5%	61.5%
B. pneumoniæ	20.0%	20.0%
Streptococcus longus	8.0%	8.0%

Method.—In making the direct smears the following was the technic employed: The lower lid was everted and a platinum loop, sterilized by heating to redness in a flame and allowed to cool, was drawn across the fornix, gathering up any beads of pus or mucus present. The material thus obtained was spread on glass slides in a fairly thin film. Lumps of pus were broken up with the loop and spread evenly. Whenever possible two slides were made, and one stained by carbol methylene blue and the other by Gram's method counter stained with neutral red. If very little exudate could be obtained, only sufficient for one slide, the film was stained by methylene blue.

Morax-Axenfeld diplobacillus, Koch-Weeks bacillus, pneumococcus, bacillus xerosis, gonococcus, staphylococci and Friedländer's pneumobacillus can often be differentiated at once by the microscopic examination alone. It is often difficult or impossible to differentiate the streptococcus from the pneumococcus, and probably many of the organisms in the eye diagnosed as pneumococci are really streptococci, the crucial test being animal inoculation.

In some cases, notably in those of Koch-Weeks infection, the smears gave more useful information, as regards the infecting organism, than the culture. This result is partly due to the difficulty of growing Koch-Weeks bacillus, and partly to the antiseptics so often used in the eyes of the patient before being seen by the bacteriologist, the antiseptic being present in sufficient concentration to inhibit the growth of the organism on

the artificial medium, but not preventing its increase in the living tissues of the conjunctival sac. There were very few cases of gonococcal infection in which the diagnosis could not have been definitely made without resort to cultivation. In some cases the finding in the culture was different to that in the direct smear. This may have been due to errors of observation or interpretation of the microscopic examination. On many occasions a definite diagnosis could not be given upon examination of the direct smear, and some such report as "a Gram positive diplococcus" was sent out. N. M. B.

The Necessity for the Use of Color Names in the Testing for Color Blindness.

Edridge-Green, F. W. (*Brit. Med. Jour.*, July 6, 1912). This article is a résumé of this well-known author's views, with especial reference to the practical details of color testing, which he has so frequently emphasized. E. S. T.

The Etiology and Treatment of Miner's Nystagmus, With a Review of 100 Cases.

Browne, F. N., and Mackenzie, J. Ross (*Brit. Med. Jour.*, October 5, 1912). The authors consider that the factors contributing to miner's nystagmus, arranged in the order of their relative frequency and importance, are as follows:

(1) Inadequate Light: 99 per cent of the cases had been using the Lock lamp for a number of years. Only one case was found where the naked light was allowed, and here other causes were present. The Lock lamp must be nine feet from the farthest point of the mandril, so the workman is staring into comparative darkness. In certain parts of Scotland, where the naked light is used, miner's nystagmus is practically unknown.

(2) Errors of Refraction: 90 per cent had errors of refraction, while in three cases the irritation was so great that no examination could be made. Of the 90 per cent, 48 per cent had astigmatism (myopic, hypermetropic, or mixed), 27 per cent had simple hypermetropia, and 15 per cent simple myopia.

(3) Straining of the extrinsic muscles of the eyeball: This is the result of the two foregoing factors. In all cases the workman has his eyes fixed in a staring, strained position for long periods: either downwards and laterally, as in narrow seams, or upward, as in wide seams.

(4) Neurotic temperament: The inability on the part of a very large number of men with nystagmus to concentrate their physical or mental powers in any particular line of action guides us to the conclusion that such inability is probably much more the cause than the effect of the nystagmus.

Prevention resolves itself into medical examination of all men engaged to work under ground, and periodic examination of all underground workers for the presence of refractive errors, any sign of incipient nystagmus, and for physical or nervous debility. To this must be added the importance of adequate light. The curative treatment may be summed up in a single sentence: Rest, strychnin, and the correction of refractive errors. The cases are all carefully tabulated. E. S. T.

Some Remarks, With Statistics, on the Treatment of 1305 School Children at the Royal London Ophthalmological Hospital.

Moxon, Frank (*Brit. Med. Jour.*, October 19, 1912). The paper deals with the methods employed in making examinations for the London County Council. The statistics of refractive errors, strabismus and other defects are given in detail.
E. S. T.

Discussion on Salvarsan in Diseases of the Eye.

Stephenson, Sydney (*Brit. Med. Jour.*, October 19, 1912). In opening the discussion, Mr. Sydney Stephenson limited his remarks to the action of salvarsan in syphilitic diseases of the eye. The remedy, he thought, was best given in series, by the intravenous route, and he was of opinion that it should be supplemented by mercurial inunctions. He did not believe that it had any harmful effect upon the optic nerve, healthy or diseased. Its administration did not of necessity prevent the subsequent appearance of syphilitic disease of the eye. In the treatment of interstitial keratitis due to inherited syphilis, good results might be obtained by a series of injections, but a single injection, in Mr. Stephenson's experience, seldom produced any marked effect. Salvarsan acted better and more speedily than mercury in the iridocyclitis of secondary syphilis. Mr. Stephenson considered that the serum reaction should throughout remain the touchstone as to the efficacy of treatment and the permanence of cure. The continued absence of clinical manifestations had less value. E. S. T.

Discussion on Iridocyclitis.

Coats, George (First Paper) (*Brit. Med. Jour.*, October 19, 1912). This paper is mainly a discussion of autointoxication as the causal factor of chronic iridocyclitis, and of some features of sympathetic iridocyclitis. He refers to Elschnig's effort to prove that autointoxication may be responsible for a large number of inflamamtory conditions of the eye, and the importance to be attached to indicanuria The author seems rather doubtful as to the true connection in these cases He then speaks of an extremely chronic type of cyclitis, in which keratitis punctata is associated with heterochromia and cataract. The keratitis punctata and lens opacity is found always in the lighter colored eye.

He refers to Fuchs' recent analysis of the following theories: First, that the iris may become bleached in consequence of the cyclitis, or second, that the blue color of the iris may be the primary phenomenon.

The first of these explanations Fuchs rejects on the ground that case histories and actual observation prove the blueness to be in fact antecedent to the cyclitis. The author calls attention to the insidiousness of this condition, and considers that it is very difficult to fix the exact date of the commencement of the condition. He thinks that it is perhaps more probable that the process is primarily a cyclitis of an insidious and chronic type, which is associated with bleaching of the iris and with the formation of secondary cataract. Concerning sympathetic ophthalmia the author assumes two points that modern research seems likely to establish. "That the disease is due to a living organism, be it bacterium or protozoon, and that this organism reaches the second eye, not by the nerves or orbital veins, but by the general circulation." Recently, Priče-Jones and Brown have suggested certain resemblances to the latency and recrudescence of the spirocheta pallida in the tertiary stage of syphilis, and the author, acting upon this, has recently administered salvarsan in three cases, with what seemed to be good results, in the main.

Ormond, A. W. (Second Paper). This paper is limited to the discussion of rheumatism and gout as etiologic factors in iritis. He quotes statistics of rheumatism and iritis in Guy's Hospital, and remarks that "when we consider the tens of thousands of cases of acute rheumatic fever treated all over the

civilized world in the last ten years, the amount of evidence to prove an association between rheumatism and iritis is practically nil." Where iritis seems to have occurred in connection with the streptococcus rheumaticus, he is of the opinion that it realy results from a secondary infection from the nose, mouth and intestinal tract, or elsewhere. Gout as a causative factor of iritis has still less to recommend it, for there is no authority for suggesting that its manifestations are due to the presence of microorganisms in the joints and tissues, and he believes that iritis and iridocyclitis are due, invariably, to the presence of microorganisms in the uveal tract. He calls attention to the fact that organisms directly transferred to the interior of the globe produce a much more violent reaction than when injected into the veins, and concludes that there is no evidence that toxins alone are capable of producing a localized inflammation of the uvea, and that for this reason gout as an etiologic factor must be abandoned. E. S. T.

The Board of Trade Standard of Eyesight for Sailors.

Grossman, Karl. (*Brit. Med. Jour.*, October 19, 1912). This paper is a discussion of the visual requirements, especially with regard to some of the criticisms brought about by the Titanic disaster. The author makes a strong plea for the compulsory visual testing of officers and men, and for allowing the use of glasses when necessary. The old standards of vision required one-half normal vision in each eye. From 1914 it will be normal vision of one, and one-half normal vision of the other eye. In color vision the Holmgren test in any form, "including that recommended by the Departmental Committee's report, is not reliable." He finally summarizes as follows what he calls the minimum demands:

Minimum Demands.—(A). Form Vision. 1. The proposed new Board of Trade standard is not only not too high, but, on the contrary, too low.

2. It should be 20/20 for each eye separately.

3. Vision which can be brought up by the help of spectacles to 20/20 or above, should be admitted.

4. Vision should be tested, not only in the case of ships' officers, but of every sailor, and should be noted on the papers of each man.

5. Vision should be tested not only for daylight, but also

for night, and the result noted on the papers of each man, so that the skipper may know whom to place on the lookout, and whether in daytime only or also at night.

6. Retesting should take place at certain regular intervals, so as to make known any subsequent changes (defects) to the men themselves and to the owners, such changes not necessarily disqualifying from further service, and especially not if correction be possible by glasses.

7. (B) Color Vision. The Holmgren test is unreliable.

8. A lantern test is required with a suitable lantern.

9. The lantern test suggested in the Departmental Committee's report is quite inadequate.

10. Each eye should be examined separately.

11. Every sailor—officers and men—should be examined, and the result noted on his papers, for the reason stated under No. 5.

12. Color vision should be retested at certain intervals, as there is such a thing as acquired color deficiency without much deterioration of form vison. The result should be noted on the man's papers.

13. A color ignorance test is superfluous.

14. All tests for vision should be made by properly qualified men. E. S. T.

Ocular Imbalance and Auditory Affections—An Investigation Into the Relationship.

Bradburne, A. Allison (*Brit. Med. Jour.*, October 19, 1912), refers briefly to the parts played by the eyes and the semicircular canals in the maintenance of the equilibrium of the body, and the well known fact of the appearance of nystagmus in irritation of the semicircular canals. He has found in five out of seven cases of labyrinthine affections that the vertical meridians of one or both eyes tended to lean outwards at the upper end. About forty cases of intratympanic and labyrinthine affections, ex petrosal complications and mastoid operations are tabulated. He is aware of the difficulties of such work and the opportunity for falling into error, but feels justified, nevertheless, in drawing the following conclusions: The occurrence of nystagmus and labyrinthine affections proves that a relationship exists between the labyrinth and the ocular balance; that the relationship can be further logically assumed from the manner in which the conjugate centers can

be expected to be influenced by the semicircular canals. That the examination of afflicted cases of disease of the labyrinth shows a majority of them causing an ocular disturbance in the maintenance of parallelism of the vertical meridians; that when disease tends to invade the deeper parts in the neighborhood of the auditory organ, an ocular imbalance follows which is manifest in a difference in the elevation of the eyes.

E. S. T.

Intraocular Hemorrhage.

Inglis Pollock, W. B. (*Brit. Med. Jour.*, October 19, 1912). The causes of retinal and vitreous hemorrhages are briefly summarized. Postoperative hemorrhage is generally of choroidal origin, and produces at once complete separation of the retina. Subhyaloid is briefly mentioned, and the case of a man 53 years old, who made complete recovery, is reported. He cites the histologic examination of a case reported by Fisher. The blood was found spread out on the inner surface of the retina, with the internal limiting membrane detached over it. The fact that the vitreous often shrinks from the fovea, during hardening of the eyeball, has suggested that the great frequency of these hemorrhages at the macula is due to the apparently slender attachment of the hyaloid membrane in this area. E. S. T.

Discussion on the Use of Tuberculin in Diseases of the Eye.

Mackay, George (Opening Paper) (*Brit. Med. Jour.*, October 19, 1912). It is impossible in the limits of an abstract to do justice to this important paper. A number of illustrative cases are quoted, phagocytic indices are given, and there are thirteen excellent color cuts. In the use of tuberculin for diagnosis he prefers von Pirquet's cutaneous reaction, in which he uses Koch's old tuberculin in 25 per cent dilution up to full strength. "This test has the great merit of safety and simplicity, and though it does not reveal the whole truth, it tells enough to justify a trial of tuberculin in the treatment of many doubtful cases." Moro's ointment test is a modification of von Pirquet, but not so reliable. Calmette's ophthalmic reaction is dangerous and should not be used when there is local eye disease. In the subcutaneous method, 1/10,000 cc. of the original tuberculin is given, and the general and local reaction is noted. The local reaction is not free from danger,

therefore the author does not favor the test in eye disease.

"The production of a lowered or 'negative phase' in the phagocytic index, taken about twenty-four hours after the injection, and followed by a 'positive phase' with raised index for a variable period thereafter, has been largely used as a guide or confirmation of the diagnosis."

For diagnostic purposes either the human or bovine strain appears to be capable of exciting cutaneous reactions, but definite observations of the points of difference are required. The author is aware of the difficulty in obtaining correct figures for the phagocytic index, but still regards it as an aid to diagnosis of very considerable value.

The safest preparation for treatment appears to be Koch's (TR), human or bovine, which produces the least violent reaction. When a more powerful effect is desired, the bacillary emulsion (BE) may be employed. The two chief methods of administration have been Wright's, in which, commencing with a small fraction, 1/80,000 mg. to 1/10,000 mg., the dose is gradually increased over a prolonged period at about ten days' interval between doses, the amount being regulated by the phagocytic index; and von Hippel's, who begins with an initial dose of 1/500 mg. of TR, the inoculation being repeated on alternate days, and increased until one milligram is reached. If during the treatment the temperature rises above 100° the previous dose or a smaller one is repeated until there is no rise of temperature after the inoculation. He has had good results in cases with iridocyclitis, punctate keratitis, and in cases of interstitial keratitis which responded to the cutaneous tests. He is doubtful about the relationship of phlyctenular disease and tuberculosis, and says that he cannot "go further than the belief that they are manifestations of local staphylococcic infection in a soil well suited for tuberculous cultivation, often, indeed, already planted and flourishing elsewhere in the system." He has had good results in these cases by the employment of mixed vaccines.

Richie, L. C. Peel (Second Paper). This paper is a description of the methods employed in obtaining the data for the foregoing paper, as regards blood examination, phagocytic indices, etc.

Dor, Dr. Louis (Third Paper). This paper gives briefly the author's results in the use of tuberculin, and he concludes

that the treatment never does harm when used with some rules; that it helps the cure of the disease, but acts less quickly than one could hope. Two or three months are generally necessary, and in very severe cases a year or more may be required.

E. S. T.

The Treatment of Word Blindness, Acquired and Congenital.

HINSHELWOOD, JAMES (*Brit. Med. Jour.*, October 19, 1912), believes that it is clear that much can be done in the treatment of such cases, if it be done on the proper lines. Several cases are cited. The idea is mainly to work through the auditory memory, beginning with the letters of the alphabet, passing on to syllables, and finally words. Every child should be taught alone, and a number of short lessons a day is a better plan than one long one which is apt to lead to exhaustion. He has at times used block letters, thus deepening the visual impression with the tactile sense.

E. S. T.

Studies of the Accommodation.

DUANE, ALEXANDER (*The Ophthalmoscope*, September, 1912), as a result of work done some five years previously, suspected that the mean values which Donders assigned to the accommodation were in some respects erroneous, and began a series of tests that finally included 1050 cases, varying in ages from eight to sixty-eight years. These mean values are plotted and the resulting curve compared with that established by Donders. The most striking variations are as follows:

In the first place, the author found the average amount of accommodation at the age of eight to be 14 D., instead of 18 D., as established by Donders. At the age of twenty-five, the two mean values of accommodation are the same, each being 11 D. Between the ages of twenty-five to forty-five, the author finds the accommodation more active. At the age of thirty-six, for instance, it was 7 D., while Donders found it to be but 5 D. At the age of 46, the results were again the same, each 3. D. From age forty-six on, the author's curve falls below a small amount, but according to both observers the accommodation remains nearly constant after the age of fifty-three, diminishing not more than 0.50 D. in fifteen years.

To determine the amount of accommodation, each case under the age of forty-eight was refracted under homatropin. With

the full correction on, the distance of the near point from the anterior focus of the eye was carefully measured with a Prince rule, and the amount of accommodation expressed in diopters. As the subject's far point had been placed at infinity by his glass, the result represented his total range of accommodation. The value of the accommodation in each case was set down on a chart, and from the total mass of observation were deducted: (a) The mean value of accommodation at each eye; (b) the limits within which this accommodation may vary in subjects that can properly be regarded as normal. The values for the mean range being connected, gives the mean accommodation curve. In another figure the limit of the accommodation in normal cases is plotted.

The author lays stress on the importance of knowing the normal limits of accommodaiton in a given case, rather than the average mean.

One table is given which gives the "normal" values of the accommodation power at all ages from eight to sixty-eight, and another giving "approximate" values of accommodation for each four year period. Because of the practical importance of the latter it is included in this abstract.

Age.	Lower limit in normal cases.	Usual upper limit.
8	11.50	15.50
12	11.	15.
16	10.50	14.
20	9.50	13.
24	8.50	12.
28	7.50	11.
32	6.50	10.
36	5.25	8.50
40	4.	7.
44	2.50	5.50
48	1.50	4.
52	1.	2.25
56	0.75	1.75
60	0.75	1.50

After stating clearly the precaution to be observed if the tests are to have any value, the author compares his results with those of Donders and others, then takes up the "clinical

aspect of these studies," laying stress on the importance of measuring the accommodation in doing routine refraction work. To get a satisfactory result with homatropin, the cycloplegic should be so complete that the range of accommodation is certainly less than 1 D. In postcycloplegic tests, the determination of the near point shows whether there is or is not some lingering remnant of cycloplegic effort. Also in the treatment of presbyopia, whether it be natural or premature, it is of the most importance.

Conclusions.—1. From repeated careful examinations conducted for five years in 1,500 subjects, of which 1,050 were available for tabulation, it has been possible to determine with apparently sufficient accuracy the mean, minimum and maximum values of the accommodation at all ages from eight to sixty-eight.

2. The mean values differ somewhat from those of Donders.

3. It is believed that the new values are more accurate than those of Donders, because made on over eight times as many subjects, and because in the present series of cases all ametropiæ were carefully neutralized by glasses in every instance, while in many of Donders' cases it is probable that the presence of an uncorrected latent hyperopia vitiated the results to the extent of a diopter or more.

4. The methods used furnish a convenient and accurate means of determining the accommodation for clinical purposes. Such a determination should be made in every person who is being examined for glasses. The results of this determination afford clinical data of considerable importance, which may often cause us to modify our prescription for glasses or to institute treatment for subnormal accommodation.

W. R. P.

The Nasolacrimal Canal—The Extent to Which It Is Formed by the Maxilla, and the Influence of This Upon Its Caliber.

Whitnall, S. E. (*Ophthalmoscope*, October, 1912), gives the results obtained in an anatomic study of the nasolacrimal canal from the examination of fifty adult European maxillæ.

Normally the nasolacrimal canal is formed in greater part by the sulcus lacrimalis of the maxilla, the gap between the lips of which on the medial or nasal side is completed normally by the descending process of the lacrimal bone above

articulating with the lacrimal process of the inferior turbinated bone below. The extent to which these two processes take part in the formation of the medial wall of the canal is variable, and is compensated by the degree of development of the lips of the sulcus lacrimalis.

In the more common type the sulcus was found to form about three-quarters of the circumference of the canal, the edges of the sulcus separated by an interval of 4 mm. This condition was found in thirty-one specimens. The canal in these cases is always roomy, an anteroposterior diameter of 8 mm. being present in several.

In twelve cases the lips of the sulcus approached to within 1 or 2 mm., but no definite narrowing of the lumen was noted.

The remaining seven cases showed the lips of the sulcus meeting and fusing so that the central part of the canal was formed entirely by the maxilla, leaving only a small part of the medial wall above to be completed by the lacrimal bone. The feature of particular interest is that in six of the seven bones the canal was much narrower than in the other specimens, and in four presented a decided constriction, one case measuring but 3 mm.

In view of the fact that in forty-three cases where the lips of the sulcus did not meet, no definite narrowing of the canal was found, whilst it existed to a marked degree in six of seven cases when the lips did meet, it sems permissible to conclude that narrowing of the nasolacrimal canal is specially prone to occur in those cases where it is almost entirely formed by the meeting of the edges of the sulcus lacrimalis of the maxilla.

W. R. P.

A Case of Ulcerative Keratitis Caused by the Bacillus of Diphtheria.

Buchanan, Leslie (*Ophthalmoscope*, October, 1912), reports a case of corneal ulcer due to infection with the Klebs-Loeffler bacillus.

A laborer, aged sixty-nine years, complained of his left eye having been sore for some weeks past. The eyelids were congested and a moderate amount of purulent discharge was present. There was no trace of adherent membrane.

The cornea was ulcerated over the lower third, the surface of the ulcer slightly raised and composed of shining, grayish-yellow, slonghy material, with two or three little flecks of what

looked like blood clot. The upper part of the cornea was clear, and blood could be seen lying in the anterior chamber.

Bacteriologic examination showed the bacillus diphtheriæ in practically pure culture.

The ulcer continued to extend, in spite of local treatment, until fully half the cornea was involved and hypopyon was present.

A subcutaneous injection of 4,000 units of diphtheria antitoxic serum was given, with immediate improvement. Four days later the cornea showed a well cicatrized leucoma.

This case is of interest in that an ulcer of the cornea of highly malignant nature, advancing markedly and rapidly, began to heal at once after a single injection of diphtheric antitoxin, cicatrizing rapidly, in spite of the age of the patient.

W. R. P.

The Sliding Flap Operation in the Removal of Cataract.

Van Lint, A. (*Ophthalmoscope*, October, 1912). This operative procedure, described in detail, was devised as a method of cataract extraction which would be efficacious against both prolapse of the iris and infection.

Under local anesthetic the conjunctiva is detached, by means of forceps and blunt curved scissors, from the upper half of the corneal limbus and dissected from the sclerotic upwards to the extent of 8 mm. to 10 mm. Two silk sutures are then inserted, one on each side of the cornea. The lower end of the thread is introduced beneath the conjunctiva 2 mm. below the horizontal meridian of the cornea. The upper suture is passed beneath the detached conjunctival flap to a point about 10 mm. above the lower end. The sutures should be placed in such a manner that when they are tied after extraction the detached flap glides in front of the corneal wound, covering the upper fourth of the cornea.

The cataract is then extracted according to the classic method; large corneal incision at the limbus, the section encroaching rather more upon the cornea than upon the sclerotic; discission; extraction of the crystalline; reduction of the iris with the spatula.

The threads are cut close to the knots, in order that they may not irritate the cornea. A drop of physostigmin oil is instilled, and a binocular bandage is then applied and left in

place for forty-eight hours. By that time the anterior chamber is reformed, and a drop of atropin is instilled. After that the bandage can be reapplied every day, only to the eye operated upon, and atropin can be instilled, if it be thought necessary. There is often no need to disturb the sutures; they usually drop out about the fifth or sixth day; if not, they may be removed.

The conjunctiva gradually retracts. Sometimes one finds that after forty-eight hours it has already receded from the cornea; at other times it continues to cover the cornea until the fourth or fifth day.

The advantages of the sliding flap are the protection against both prolapse of the iris and infection. In effect the edges of the wound are intimately applied to one another, thus fixing the eyeball so that the iris finds no point of exit.

The conjunctiva has a tendency to retract; it exercises a pressure from before backwards, and consequently pushes the anterior lip of the wound against the posterior lip in a constant manner. The conjunctiva, drawn into place by sliding in front of the wound throughout its extent, acts as a real splint and assures a good coaptation of its lips, which is of primary importance for rapid cicatrization.

The wound is covered by the conjunctival flap, and thus protected from the conjunctival sac, a medium rich in microbes and a source of infection for the eyeball. The cicatrization can go on in an aseptic medium, and there is no fear of development of microbes in the interior of the eye, seeing that the well-sterilized instruments do not introduce any microorganisms into it.

Even when the conjunctival flap retracts at the end of forty-eight hours, it has fulfilled its function. Thanks to the coaptation of the wound it has brought about, the cicatrization has become sufficiently firm and solid to prevent hernia of the iris, while the corneal epithelium has proliferated enough to form a barrier against infection. W. R. P.

Tubercle of the Choroid in Tuberculous Meningitis.

MARPLE, WILBUR B. (*Ophthalmoscope*, October, 1912). During the past four years there were 128 cases of tuberculous meningitis at the Babies Hospital, New York City, in only 5 per cent of which tubercles of the choroid were found. Be-

cause of the great disparity between these figures and the statistics of Carpenter and Stephenson, who reported choroidal lesions in 50 per cent of their cases, the writer was led to have more frequent examinations of the fundus made in these cases.

Careful and repeated examinations of the fundus in the last thirteen cases revealed choroidal tubercles in each case—that is, the examination was positive in thirteen consecutive cases, giving a percentage of one hundred.

In several cases, which were examined on successive days, one or more tubercles were found which were not present the day before, and one case, carefully examined and nothing found, four hours later showed a tubercle.

The choroidal lesions were small, miliary tubercles, round or oval in shape, rarely irregular, of a grayish or grayish-white color, and usually without any pigment, as though the retinal pigment epithelium had been gently brushed away, leaving a socalled "moth-eaten" edge. Retinal vessels are frequently seen traversing the surface of the tubercles. In size the tubercles vary from a speck to a mass the size of the optic papilla or larger. The majority were about one-fourth the diameter of the disc, generally situated in the neighborhood of the optic disc or macula. In the greater number of cases they are limited to one eye only.

Papillitis was found in four cases. Descemetitis, as in other forms of exudative choroiditis, was not found in cases of tuberculous meningitis with tubercles of the choroid.

The fact that with the greater frequency of examination, several times a day, the percentage jumped from 5 to 100, leaves little doubt as to the importance of frequent examination. W. R. P.

On Salvarsan and Neosalvarsan in Affections of the Eye.

Ramsay, A. Maitland (*Ophthalmoscope*, November, 1912), gives his personal observation of the use of salvarsan and neosalvarsan in twenty-two cases of syphilis of the eye. The method of administration was by intravenous injection.

The dosage averaged from .3 gram to .5 gram, according to the age, sex, and constitution of the patient. It was as a rule repeated in about a fortnight, and in a few cases a third injection was given at a longer interval. All injections were reinforced by mercurial treatment.

Of the twenty-two cases under consideration, all but two were suffering from a chronic form of syphilis. Of these twenty, five had inherited and the remaining fifteen acquired the disease. The clinical diagnosis was confirmed by the Wassermann test.

Of the five congenital cases, two suffered from interstitial keratitis, two from choroidoiritis, and one from advanced optic atrophy, the result of a specific intracranial affection. The case of optic atrophy, as was to be expected, was in no way benefited so far as sight was concerned, although the patient's general health was markedly improved. The two patients suffering from keratitis had previously undergone a course of treatment with mercury, and in both the improvement which followed an intravenous injection of salvarsan was rapid and decided. Neither of the patients suffering from choroidoiritis received any perceptible benefit, but in both the pathologic changes in the eyes were such that successful treatment could not reasonably be expected.

Among the seventeen cases of acquired syphilis, a chancre of the left upper eyelid was completely healed eight days following an intravenous injection of .3 gram neosalvarsan. Two cases of oculomotor paralysis, one of two years' duration, the other of seven months, both made complete recovery as far as paralysis went. Syphilitic ulceration of the conjunctiva of six months' standing, with extensive symblepharon, receded after .4 gram of salvarsan. Recurrence following five months later, because of neglected treatment, and affecting both cornea, was again healed following two injections of .3 gram of neosalvarsan.

One case of scleritis was treated without any apparent improvement. Considerable improvement was apparent in keratoiritis, possibly of congenital origin, after two injections.

Five cases of iritis, in one in which the condition was acute and both eyes affected, the immediate effect of salvarsan was simply magical. In two or three days the eyes were free from inflammation, and all symptoms disappeared completely within three weeks. In the other four, the disease was of much longer standing, and although the efficiency of salvarsan was undoubtedly great, the results following its administration were not so extraordinary as in the first case.

Five cases of choroiditis, all showed improvement; the

more recent the infection, the more acute the inflammation, the more rapid and decided was the action of the salvarsan.

Some improvement was apparent in a case of choroidoretinitis of two years' duration, after a third injection. One case of neuroretinitis, in which the appearance of the fundus was suggestive of gummi of the retina, showed striking change in appearance in three months, following two injections of salvarsan.

There seems to be no difference in the therapeutic effect of the neosalvarsan and the salvarsan, but it is claimed for the former that it is more active and that the undesirable after-effects are less liable to follow its use. The ease and accuracy with which the new drug is prepared for injection, and the neutral reaction of the solution, are two very strong points in its favor, while the rapidity with which salvarsan acts is undoubtedly its most outstanding characteristic. Experience supports the view that the most trustworthy results are obtained when it is combined with a course of mercurial treatment.

Occasionally a recrudescence of the disease occurs after an injection of salvarsan—iritis, choroiditis, neuritis, etc.—but this ought to be regarded as a further manifestation of the syphilis rather than a noxious action of the drug, and should in consequence be met by energetic antisyphilitic treatment.

Salvarsan acts best in the acute ocular manifestations of syphilis. In chronic cases its good effect is neither so rapid nor so striking. Its value lies in its great power to destroy the spirochetes before they have had time to produce irreparable damage to the delicate structures of the eye. It therefore prepares the way for the mercury, and consequently the one drug is the complement of the other. The judicious applications of leeches, counterirritants, and subconjunctival injections, as well as the use of pilocarpin hypodermically, are valuable adjuvants to the constitutional treatment, and their use at the proper time may make all the difference between success and failure. W. R. P.

On Salvarsan.

Markle, W. B. (*Ophthalmoscope*, November, 1912.) Salvarsan was used in two conditions: interstitial keratitis, and specific iritis with a gummi or syphilitic papule of the iris.

In several cases of interstitial keratitis which showed a

markedly positive Wassermann reaction, salvarsan produced no appreciable effect on the condition of the keratitis, except possibly a slight diminution of the photophobia, although the Wassermann reaction was subsequently negative.

Two cases of iritis, also showing a positive Wassermann reaction, with a so-called gummi of the iris in each, were treated with salvarsan. Pain, photophobia, lacrimation and ocular injection, which were intense, abated under local treatment, but in neither case was there any effect in the papule of the iris, which in one case involved two-thirds of the breadth of the iris in the lower nasal quadrant. Injection of salvarsan was followed by extraordinary disappearance of the papule. The large one was diminished in size one-half in forty-eight hours, and at the end of five or six days had disappeared, leaving a synechia.

The conclusion was reached that there was no effect with salvarsan in interstitial keratitis, except possibly slight diminution of the photophobia, and that in specific iritis with nodules, it causes the rapid disappearance of the so-called gummi of the iris. W. R. P.

On the Toxicologic and Therapeutic Influence of Salvarsan and Neosalvarsan Upon the Eye.

Igersheimer, Joseph (*Ophthalmoscope*, November, 1912), has shown by experiment that while the compounds of arsenic have certain qualities in common, they have also their peculiar characteristics dependent on their molecular values. The prominent quality of salvarsan is its strong parasitotropic effect on the spirochetes of syphilis, and the slight amount of its organotropic effect. Salvarsan has so slight an affinity for the nervous system, that after several years' experience the statement is made that there is no such thing as injury to the eyes of a non-syphilitic person by salvarsan.

There is a little difference in an organism infected with spirochetes. In the case of a young man who has received several injections of salvarsan, the only relapse which appeared was an iritis; two days after another injection of salvarsan, very severe disease of the retinal vessels took place in the second and, until this time, unaffected, eye. It is quite possible that it is here a matter of reaction of the spirochetes, which have been for some time lodged in the walls of the retinal ves-

sels. The much-spoken-of recurrence in the nervous system points to the fact that here and there we have to do with stimulating qualities of salvarsan, as such recurrences are also reactions of the syphilitic nervous tissue to the stronger antisyphilitic remedy. It is not very probable that the salvarsan itself injures the nervous tisue, or creates a locus minoris resistentiæ, but that the specially strong influence on the spirochetes brings this effect about.

Three cases of papilloretinitis as a form of relapse after two or three injections of salvarsan were observed. All were on one side, appearing in a secondary stage. In two cases the Wassermann was negative, in one case it was weakly positive. All three had at the time of relapse no other appearance of syphilis. Ehrlich and Gennerich also suggest that this relapse is a monosyphilide, in a certain degree of a new primary effect, from which for the second time an infection of the earlier sterilized body takes place.

The syphilitic character of such nerve affections is also proved by the favorable influence of further salvarsan injections.

As in the cases of relapse, so also in recent cases of sphilitic diseases of the retina and the optic nerve, salvarsan proved favorable, in both acquired and inherited syphilis. It is the most recent cases of the nervous system of the eye that offer the best field for salvarsan therapeutics: especially as the quickest means of help is the best. The quicker progression of the optic nerve process following injection has not been observed.

Salvarsan often acts excellentiy in other inflammatory affections, above all those of the uveal tract. On the other hand, it must also be said that it is especially the iritis papulosa which is sometimes very obstinate, the more remarkable when we consider the great abundance of blood in the iris.

Experience with salvarsan in insterstitial keratitis showed improvement after one injection in 5 per cent out of thirty-nine cases; after second injection, 25 per cent out of twenty-four cases; after third injection in 36 per cent of eleven cases. By improvement is meant only a certain favorable influence in the course of the cure, and never a really quick cure.

Salvarsan is preferred to mercury, or combined with it, because of the favorable influence on the Wassermann reaction. The Wassermann reaction in 50 per cent of the cases treated

by salvarsan became negative. Some of these showed a positive reaction a year later, but the percentage is very much more favorable than with mercury alone.

Among paralyses of the ocular muscles many were absolutely resistant to salvarsan, among which however were several tabetic cases. Three cases of paralyses of accommodation became very much better or cured.

Salvarsan acted especially well in a case of total paralysis of accommodation of the entire eye muscle system on account of a gummi in the orbit which pressed upon the optic nerve. In this case preservation of the sight was due only to the speedy effect of the salvarsan.

In isolated cases also (chancres, periostitis orbitæ, lupoid syphilis of the cul-de-sac) salvarsan rendered good service.

Toxicologic experiments with neosalvarsan were carried out upon six cats treated with intramuscular injections. A large dose was very toxic, while smaller doses were well supported, even when they were frequently given. The details of the experiments are given in a table. Microscopically, no changes were to be found in the eyes; in the optic nerve at the most was an insignificant Marchi reaction. The rapid death of two of the animals after injection of larger quantities is very striking, as a corresponding quantity of salvarsan has never shown such an acute effect.

Some preliminary experiments on the normal eyes of rabbits were also carried out with a local application of neosalvarsan. Injections of dilute solutions into the cornea showed slight cloudy reaction, which passed away after a few days without leaving any maculæ; in stronger solutions the cloudiness lasts a much longer time and is much more intense. Subconjunctival injections were sometimes followed by necrosis of the conjunctiva, but necrosis of the cornea was never observed, even if the remedy was injected into the cornea itself.

In the case of two female patients, who also had nervous symptoms apart from their eye disease, injections of neosalvarsan caused much stronger reaction than had ever been observed with salvarsan. In both cases it was an instance of a great increase of already existing syphilitic symptoms.

In several cases of interstitial keratitis, after the first injection of neosalvarsan, such a quick and favorable influence

made its appearance as had never been seen when salvarsan was used.

The conclusion is reached that, all things considered, salvarsan and neosalvarsan are very good, if not ideal, remedies for the eye. The writer proposes to use neosalvarsan in the case of affections of the anterior parts of the eye, and salvarsan for affections of the retina and optic nerve, especially when the nervous system is attacked in any way. W. R. P.

On Salvarsan in Diseases of the Eye, With Particular Reference to Its Use in Sympathetic Ophthalmitis.

Browning, S. H. (*Ophthalmoscope,* November, 1912) Seventeen cases of sympathetic ophthalmitis were treated with intravenous injections of salvarsan. The treatment was based on the fact that in sympathetic disease the differential blood count is of the same type as that found in protozoal infections. The large mononuclear leucocytes are markedly increased, chiefly at the expense of the polymorphonuclear cells.

No cases were entirely cured, except three cases in which the diagnosis, apart from the blood count, was not certain; but in each case the blood count approached the normal and the eye condition was much relieved. The cases treated were of long duration: better results might be expected from earlier cases. Most of the cases gave a negative Wassermann reaction.

W. R. P.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

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On the Permeability of the Iris to Light in the Normal and Cataractous Eye Subjected to Scleral Transillumination.

RUEBEL, Freiburg (*Graefe's Archiv. fuer Ophthal.*, Vol. 82, Part 2), arrives at the following conclusions:

I. Normal Iris. The permeability of the iris to light is governed principally by the character and structure of the stroma. Investigations concerning the transparency of the light colored iris show that not only the amount of pigment, but the density and thickness of the anterior layer, come into consideration. The pigment epithelium has no important bearing upon transparency.

These findings are in accord with the anatomic structure of the anterior and posterior layers.

The pigmentation of the fundus and the prismatic action of the lens play an unimportant part.

The permeability is enhanced by pupillary contraction and lessened by pupillary dilatation.

In the normal eye illuminated with the Sachs lamp, no difference in transparency between the upper and lower portions of the iris is demonstrable. Only in cases showing a defect in the stroma are differences noted.

The findings in the normal iris explain the dazzling phenomena produced by sunlight in light-eyed individuals

II. The iris in cataract and senile atrophy.—The clinically

visible senile atrophy of the stroma has no influence upon the transparency of the iris.

In cataractous eyes the permeability of the iris is frequently increased, due to a senile atrophy of the middle and peripheral portions of the retinal pigment layer, which goes hand in hand with the maturation of the cataract. This atrophy is often associated with the senile depigmentation of the retinal posterior layer of the iris.

In eyes with hypermature cataract there may be increased transparency in the lower half of the iris. However, it should be remembered that this can be produced artificially by applying the lamp to the lower portion of the sclera near the limbus. Abnormal transparency is suggestive of a fluid vitreous and should put the operator on his guard.

In cataract associated with heterochromia there is frequently an abnormally high degree of transparency. In most cases, however, this is not entirely due to pathologic changes in the pars iridica retinæ, but to associated atrophic changes in the anterior layer.

He concludes by emphasizing the great value of scleral transillumination in nonvisible affections of the posterior layer. In making these tests the same Sachs lamp was employed.

A. C. S.

On the Occurrence of Pneumococci in the Conjunctiva After the Extirpation of the Tear Sac.

Mattice (*Klin. Monatsbl. f. Augenheilk.*, July, 1912) examined one hundred patients at the Axenfeld clinic, from whom a tear sac had been removed. He used the Elschnig-Ulbrich method; his patients were examined from three weeks to ten years after operation. His conclusions are:

1. Pneumococci were found in 43 per cent of the conjunctival sacs after extirpation of the tear sac, and were found on both sides, regardless of the fact whether one or both sacs had been removed.

2. These pneumococci showed a mild degree of virulence for white mice. Virulence increased on passage through animals.

3. No connection between the degree of epiphora and the bacteriologic content of the conjunctival sac. Appearance of conjunctiva, whether pale or injected, is no criterion of the presence or absence of pneumococci.

4. The statement of Calderara, that removal of the tear gland synchronously with extirpation of tear passages increases the danger of corneal infection, requires further investigation.

5. The present investigations show conclusively that the removal of the tear sac in cases of dacryocystitis is an extremely important prophylactic measure against postoperative corneal infection, since the pneumococci, the usual cause of such infection, are reduced from 90 per cent to 95 per cent before to 43 per cent after extirpation, or to the amount and virulence seen in normal conjunctival sacs.

Mattice also states that as long as pneumococci are easily demonstrable in smears, they are still present in the conjunctival sac in large numbers. M. W. J.

On the Antibodies of the Cornea.

Zade, Heidelberg (*Graefe's Archiv. für Ophthal.*, Vol. 82, Part 2), cites the following conclusions:

1. The normal cornea of nonimmunized rabbits contains opsonins (for staphylococci and avirulent pneumococci) but in much smaller quantities than the blood serum. Opsonins, in the overcoming of corneal infection, do not play an important part, since they undergo no change by immunization (passive, active, general, local). In irritative conditions of the eye the opsonins, even in the human subject (two cases), increase. The most effective stimulus is puncture of the anterior chamber.

2. The complement content of the cornea (pig) is slight.

3. In the normal cornea of previously treated rabbits, entrance of heterologous serum occurs. The shortest time after injection for this passage is two and one-half hours, the smallest quantity necessary corresponding to a dose of 10 cc. in man. Subcutaneous is less effective than intravenous injection. In irritative conditions, more rapid and more marked entrance occurs.

4. The normal cornea of previously treated rabbits takes part in the appearance of precipitins, agglutinins, hemolysins, antitoxins (tetanus), and perhaps of bacteriolysins. In the irritated eye (puncture of the chamber being the most effective procedure), these antibodies increase considerably. Respecting the passage of antibodies, the cornea is much more liable than the normal aqueous. A. C. S.

On the Extracellular Influence of Leucocytes in the Vitreous, With Observations on F. Deutschmann's Work on the Pathogenesis of Sympathetic Ophthalmia.

Salus, Robt. (*Klin. Monatsbl. f. Augenh.*, July, 1912). Deutschmann claimed to have found diplococci in eyes inoculated with yellow sarcinæ and that he could produce white diplococci by passing yellow sarcinæ through rabbit eyes. He suggested that these may be avirulent staphylococci. Salus found no such change in his experiments: the sarcinæ were destroyed in the vitreous. As the vitreous contains no bactericidal substances, Salus comes to the conclusion that the destruction of bacteria is here due to bactericidal influence of leucocytes (aside from phagocytosis). We cannot make the diagnosis of abscess in the vitreous simply because we see an accumulation of leucocytes there. Their presence is merely evidence of the fact that dangerous substances are present or in the vicinity; the presence of pus is no evidence of the pathogenicity of an organism. A given organism is pathogenic for the vitreous only when it multiplies there, i. e., when the leucocytic substances cannot overcome it. M. W. J.

Experimental Investigations Concerning Syphilis of the Eye.

Igersheimer (*Muench. med. Woch.*, 1912, No. 39; Abstract in *Woch. f. Ther. u. Hyg. des Auges*, November 7, 1912) injected spirochete cultures into the carotid artery of rabbits, the resulting ocular changes being typical of syphilis in the human eye. Soon after the injection an acute choroiditis was usually observed; in rare instances a violent reaction followed, sometimes going on to phthisis bulbi. Injection of the tarsal and bulbar conjunctiva was often observed in association with the fundus changes.

Lid affections, resembling clinically the initial stage of the disease, became manifest some time after the injection. Interstitial keratitis was also observed and he believes this inflammation to be truly luetic and not metasyphilitic. Iritis and optic atrophy followed in a few cases. A. C. S.

Investigations Concerning the Apparent Increase in the Adrenalin Content of the Blood in Primary Glaucoma.

Vogt, A., and Jaffe, B. (*Klin. Monatsbl. f. Augenh.*, July, 1912), were prompted by Kleczkowski's paper on "The

Presence of Adrenalin in the Blood Serum of Glaucoma Patients" (*Klinische Monatsbl. f. Augenheilk.*, October, 1911) to examine the blood of four patients suffering with glaucoma. In all cases Gautier's modification of Ehrmann's biologic reaction was tried; in three Comessati's, and in one Zangfronini's chemical tests were applied. In none of their patients was an increase in the amount of adrenalin in the blood serum shown.

M. W. J.

Concerning Encanthoschisis and Other Congenital Anomalies of the Eyes.

Hirsch, Camill, Prague (*Klinische Monatsblätter für Augenheilkunde*, July, 1912), presents three cases involving five eyes, and describes a number of lipodermoids which appeared, not in the area between rectus superior and rectus externus which Nobbe claimed as typical in 70 per cent of such cases, but in the region of the lateral commissure. He presents his cases as a fourth type of lipodermoid whose situation is the region of the lateral commissure. Nobbe divided the lipodermoids into three classes, according to location: 1. Lipodermoids of the corneoscleral junction. 2. Lipodermoids of the transitional fold. 3. Lipodermoids of the caruncle. The presence of fully-formed hairs in one of Hirsch's cases, a typical subconjunctival lipoma, and the appearance of a lipoma at the corneoscleral junction, speak for the dermoid character of these growths.

Congenital Opacities of the Corneal Border.—In several of the above cases, marginal opacities of the cornea cause Hirsch to suggest that possibly dermoids existed at these points during intrauterine life.

Encanthoschisis.—By this term Hirsch designates a splitting of the caruncle which he saw in two individuals, and suggests the term as descriptive of the anomaly. He believes that the widely accepted theory of van Duyse, according to which congenital defects about the lids are due to amniotic strands which cross the vicinity of the eyes and become entangled about the lids, probably explains this interesting and apparently rare condition.

Epicanthus.—Hirsch saw a case of epicanthus in one of his patients in the series presenting these various anomalies, and suggests again that van Duyse's theory furnishes a possible explanation of the origin of the condition. M. W. J.

Concerning a Special Variety of Proliferating Choroiditis.

Brown, E. L. V., Chicago (*Graefe's Archiv. für Ophthal.*, Vol. 82, Part 2), publishes the history of a case (from the Fuchs Clinic) in which one eye had been injured by molten iron thirty-five years previously, followed by the formation of a pseudopterygium and amaurosis. The occurrence of inflammatory symptoms lasting eight weeks made enucleation necessary. The fellow eye remained quiet.

Microscopic examination of the enucleated eye disclosed:

(a) An ordinary fibroplastic uveitis with secondary glaucoma.

(b) A special form of proliferating choroiditis resembling sympathetic inflammation, but complicated with necrosis and not affecting the other eye.

(c) An acute, purulent endophthalmitis consequent to necrosis.

The choroidal infiltration resembled sympathetic inflammation in that it showed:—

1. Marked round cell infiltration and proliferation of epithelioid and giant cells in the middle vascular layer.

2. Comparatively few cells in the outer layers of the choroid.

3. A tendency for the intervascular infiltration to penetrate and block the lumen of the veins, the arteries in this respect being much less involved.

4. Nodular proliferation of the choroidal pigment into the retina.

It differed from sympathetic inflammation as follows:

1. The other eye did not succumb to sympathetic inflammation.

2. Absence of clinical or anatomic signs of a perforating injury.

3. The absence of nodular infiltration; however, in the later stages of sympathetic disease the nodules disappear by coalescence.

4. The presence in the choroid of new-formed vessels

5. Infiltration of the choriocapillaris, though not so pronounced as in the middle layer. The infiltration extended beyond the edge of the disc into the nerve head, and even beyond the lamina into the lumen of the central vein. The infiltration was composed of lymphocytes, plasma cells, epithelioid and giant cells.

6. Localized necrosis of the cellular infiltration and of normal choroidal, retinal and nerve tissue.

He refers to four somewhat similar cases (Fuchs, Gilbert, Botteri (2) in which the choroidal infiltration resembled sympathetic infiltration without involvement of the fellow eye. However, not one showed necrosis.

In a case included in Fuchs' original article on sympathetic inflammation the findings more closely resembled the author's, necrosis of the retina and choroid and even of the sclera being present, the other eye likewise not showing any symptoms. Inasmuch as in neither case the signs accorded with leucemic, tuberculous, luetic or sympathetic choroiditis, the writer is forced to consider them examples of a special form of proliferating choroiditis concerning the nature of which as yet nothing is known. A. C. S.

Traumatic Angiopathy of the Retina, Lymphorrhagea of the Fundus.

Purtscher, O., Klagenfurt (*Graefe's Archiv. für Ophthal.*, Vol. 82, Part 2), publishes the following conclusions:

1. More recent investigations have shown that certain frequently observed brilliant white flecks in the fundus are especially liable to complicate affections which may be associated with increased intracranial tension (acute, transient or chronic). These findings favor the view of numerous recent investigators who consider these flecks products of congestion.

2. The ophthalmoscopic appearance of such cases is characterized by white flecks, for the most part situated in the innermost retinal layers and particularly prone to follow the course of the retinal veins. They occur usually in the region of the nerve head or upon the disc or near the macula. In the great majority of cases venous hemorrhages coexist. There may or may not be abnormal changes in the nerve head.

3. In the etiology of these cases the kinds of traumatism which are apt to produce sudden, extreme increased intracranial tension play a role (falls on the head, depressed fractures of the skull, compression of the trunk).

4. In many cases showing white flecks in the fundus, including most traumatic cases, the etiologic significance of chemical or toxic agents is problematical; of mechanical factors however, more certain.

5. The influence of lymphorrhagiæ in the production of the typical fundus picture is probably very great.

6. After bodily traumatism, the ensuing fundus picture, characterized by hemorrhages and white flecks (the latter most probably originating from the lymph channels), may be designated as traumatic angiopathy of the retina in the broadest sense of the word. A. C. S.

Clinical and Microscopic Study of a Case of Solitary Tubercle of the Papilla of the Optic Nerve.

Jacobs, St. Louis (*Klin. Monatsbl. f. Augenh.*, July, 1912), describes an interesting case seen at the Freiburg clinic, which he studied microscopically. The patient had a solitary tubercle of the head of the optic nerve which had encroached on the nerve and retina. The writer points out, as Axenfeld and Verderame had previously done, that however justifiable a so-called expectant or waiting therapy may be in solitary tubercle of the eyeball, when not complicated by rupture of the bulb or severe secondary symptoms, in solitary tubercles close to or in the optic disc, the danger of an ascending process places such cases in a class which should be differently treated. With the destruction of central vision or marked decrease in the visual field Jacob thinks enucleation is in order.

The same patient was successfully treated with lactic acid, as recommended by Axenfeld for tuberculosis of the conjunctiva. Retinal strands similar to those described by Imre were found during the study of the sections, and seemed to lend weight to the theory of a transition from pigment epithelium to connective tissue, or tissue staining like the latter.

M. W. T.

Tuberculosis as the Cause of Periphlebitis Retinalis Adolescentium.

Igersheimer, Halle (*Graefe's Archiv. für Ophthal.*, Vol. 82, Part 2), publishes the histories of four cases with two colored plates illustrative of this affection.

In every case the retinal veins were principally affected, and in three cases tuberculosis seemed the most likely etiologic factor.

In three one eye was markedly involved, the fellow eyes showing only the incipient stages of the disease. The incipient

processes being generally situated peripherally, are apt to be overlooked. Recent vascular lesions appear as white or opaque perivascular infiltrations, older foci being of a brownish yellow color and more sharply circumscribed. Sometimes these fresh inflammatory foci project from the inner retinal surface and exhibit parallactic deviation.

With Axenfeld and Stock he believes these are nonspecific (anatomically) inflammatory processes, but he does not conclude that these must of necessity be of a tuberculotoxic nature (Axenfeld), since it is not impossible for tubercle bacilli to produce atypical transient inflammation.

He considers it a localized disease of the vessels consequent to a constitutional disease, most probably to tuberculosis, the first vessels to succumb being the peripheral venous branches.

While he is unable to submit positive views regarding the value of tuberculin therapy in these cases, in a few cases at least this treatment proved superior to all other methods

A. C. S.

The Prognosis of Keratomalacia.

Kapuscinski, Halle (*Graefe's Archiv. für Ophthal.*, Vol. 82, Part 2). A study of thirty-one cases of keratomalacia observed in the Royal Ophthalmic Hospital in Halle since 1907 showed fourteen deaths; eleven occurring during the first six months, one during the second half year, and two during the second year.

Of twelve marasmic children, nine succumbed to infectious diseases, the other three directly to marasmus. In one the cause of death was pneumonia, and in one the cause was unknown.

Both eyes were affected in twenty-four children, one eye only in seven. As a rule there was no relationship between the severity of the disease and pedatrophy.

Subsequent examination of twenty-four eyes showed nine with normal or nearly normal findings, the remaining exhibiting leucomatous or extreme phthisic degeneration.

He considers keratomalacia an affection of infants with impaired nutrition, the result of severe intestinal catarrh or intervening infectious diseases.

He believes the prognosis in these cases not so unfavorable as usually supposed. In the treatment of the intestinal catarrh

he found albumin milk (Finkelstein and Meyer) of service. In five dispensary cases the mortality was 100 per cent.

A. C. S.

Metastasis of Malignant Tumors to the Motor Nerves of the Eye.

Chaillons (*Ann. d'Ocul.,* June 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges,* November 21, 1912) reports four cases of abducens palsy in four patients. Three had been operated upon for mammary carcinoma, one for recurring tumor of the thyroid. Metastasis was limited to the abducens.

A. C. S.

On Injuries of the Optic Nerve, a Contribution to the Knowledge of the Relationship Between Affections of the Eye, Ear and Nose.

Kleijn, A. de, and Nieuwenhuyse, A. (*Graefe's Archiv. für Ophthal.,* Vol. 82, Part 2), refer to a case previously reported by de Kleijn, in which a central scotoma followed tumor near the optic foramen without involvement of the sphenoidal sinus. This suggested ocular examination of cases of basal fracture involving the anterior fossa, including not only recent cases but cured cases with callous proliferation and narrowing of the optic foramen as possible sequelæ. The possibility of such a complication years after the injury with resulting impairment of vision is of medicolegal interest.

The conclusions derived from an examination of fifteen cases of fracture of the base are as follows:

1. After cranial traumatism enlargement of the blind spot is found in many cases.

2. Of frequent occurrence is contraction of the peripheral visual field of a nonfunctional nature, with normal fundus findings.

3. Whether this contraction is related to disease of the labyrinth can be determined by the investigation of uncomplicated cases of labyrinth disease.

4. In doubtful cases the exact determination of the size of the blind spot and of the peripheral field for white and colors should never be omitted.

In conclusion they refer to a case of disease of the left optic nerve in a boy who showed a marked depression in the left frontal bone (normal birth, normal maternal pelvis). They assume the probable causative factors to have been insufficiency

of the amniotic fluid in conjunction with pressure of the arm upon the frontal bone during intrauterine life. They also cite the clinical history of a case of bilateral pulsating exophthalmos following traumatism. A. C. S.

Secondary Central Ecchymosis of the Disc Following Periorbital Traumatism.

Terson (*Ann. d'Ocul.*, June, 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, November 21, 1912) reports the history of a patient who was kicked in the head by a horse. No fundus changes were observed until several days after the accident, when an ecchymosis was observed upon the lamina cribrosa which later spread towards the temporal edge of the disc. A central scotoma coexisted. He attributes the condition to rupture of a vessel in the macular bundle. A. C. S.

Oculomotor Paralysis With Abnormal Cyclic Innervation of the Internal Branches.

Salus (*Klinische Monatsblätter für Augenheilkunde*, July, 1912), reports a case which he places in the class designated by Axenfeld as "congenital cyclic oculomotor disease." The pupil changes from extreme mydriasis to myosis; the mydriatic state being associated with ptosis of the upper lid, and the pupillary contraction with ciliary contraction, as evidenced by a change in refraction. Salus thinks the ptosis and dilatation of the pupil mark the beginning of the cycle, and considers the condition due to paralysis of the internal branches of the oculomotor nerve, in spite of the apparently contradictory activity of the pupils and the ciliary movements. The features which the writer wishes to bring out are:

There is a paralysis of the sphincter and ciliary muscles, but only for normal, physiologic stimuli: light, accommodation, convergence, closure of lids, sense stimuli, have no influence; on the other hand, there are influences of an unknown character, mostly voluntary impulses which are transmitted to the external eye muscles which are capable of producing "reactions" of the pupil. These, because of their character, might be designated as paradoxical if the term were not already used to express an entirely different idea.

Salus suggests as a better name for the condition the title of his paper, because it more closely expresses which symptoms

are met with. As a result of Lipschitz's work on facial paralysis, Salus is led to explain this condition on the basis of a change in the transmission of impulses due to injury to the root of the oculomotor nerve which has been followed by regeneration close to the exit from the peduncle. In the regenerative process, fibers which transmit impulses to the external eye muscles have become united to other fibers connected with the internal eye muscles. As a result, impulses are sent to the internal instead of the external muscles. M. W. J.

Diabetes Mellitus and Disease of the Optic Nerve.

Hoffmann (*Muench. med. Woch.*, No. 47, 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges,* November 28, 1912), in two cases of diabetes mellitus, found glycogen in the axis cylinder and sheaths of the nerve, associated with marked changes in the medullary sheaths. In one case lipemia was demonstrable by microchemic tests. Glycogen was also found in the optic nerves of eyes enucleated for various reasons. Further studies are necessary to determine the significance of these changes in relation to diabetes and other constitutional disorders. A. C. S.

Vermiform Contraction of the Sphincter Iridis.

Hirschberg (*Zentralblatt f. Augen.*, January, 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges,* November 14, 1912) reports such a case in the healthy eye of a seventy-three-year-old woman. Examination with the loupe showed thickening of the pupillary margin in two quadrants, movements of the iris making it appear as if a worm were crawling around the pupillary opening. A. C. S

Dazzling Changes Caused by Sunlight.

Ischreyt (*St. Petersb. med. Ztschr.*, 1912, No. 12; Abst. in *Woch. f. Ther. u. Hyg. des Auges,* October 31, 1912) reports five cases observed five to ten days after exposure to sunlight. There was impaired vision, positive central scotoma and relative scotoma for white in every case. In two cases there were disturbances of the color sense within the scotoma, in one case metamorphopsia within the scotoma, in one case marked retinal fatigue In three cases ophthalmoscopic examination revealed an indistinct, cherry red spot in the fovea; the macular reflex was absent

twice, and in one case there was clouding of the retina about the macula. In one case violent, supraorbital pains occurred; in another, a preexisting conjunctivitis was made much worse.

A. C. S.

On the Rhinologic Relations of the Lacrimal Ducts, Especially the Relationship Between Chronic Dacryocystitis and Affections of the Ethmoid and Their Treatment.

Ruest (*Deutsche med. Woch.*, 1912, No. 35; Abst. in *Woch. f. Therap. u. Hyg. des Auges*, October 31, 1912) claims that chronic dacryocystitis is often caused by ethmoidal disease, the prognosis in these cases being very favorable after operative treatment of the ethmoid. The middle nasal passage has a greater etiologic significance than the inferior duct. In the determination of the rhinologic causal factors he finds X-ray photography of service, with a sound in the lacrimal canal.

A. C. S.

The Present Status Regarding the Therapy of Senile Cataract.

Elschnig (*Med. Klin.*, 1912, No. 27; Abs. in *Woch. f. Ther. u. Hyg. des Auges*, October 31, 1912). So far conservative measures have proved ineffectual. It is possible that improvement of general living conditions and of the general health may exert a retarding influence upon the progress of the disease.

Operation is indicated in every case with insufficient vision, excepting eyes with swollen lenses. Ripening procedures are unnecessary.

Iridectomy as a preliminary operation is advisable in cataract complicated with glaucoma or posterior synechiæ; cyclodialysis or iridectomy in compensatory glaucoma (glaucoma simplex), posterior sclerotomy in incompensatory glaucoma (acute glaucoma).

If the vision in both eyes is bad, both eyes should be operated upon at the same time. Operation is indicated in unilateral cataract with good vision in the fellow eye. In high grade myopic eyes, early operation is indicated.

The age of the patient is of no consequence. In very old individuals the blood pressure should be taken, and if expulsive hemorrhage is anticipated, Dye's venesection should be performed. The patient's general condition should be looked into and careful bacteriologic studies of the conjunctival sac made.

He makes a large flap incision (one-third to two-fifths of the cornea) very near the limbus, with a conjunctival flap. After incising the root of the iris and removing a large piece of the anterior capsule, to prevent the subsequent occurrence of secondary cataract, he extracts the lens. Eserin for twenty-four hours. The Smith operation is only to be tried in exceptional cases. A. C. S.

Is It Necessary to Await the Complete Maturity of the Cataract Before Operating?

Grandclement (*Lyon med.*, 1912, No. 36; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, November 21, 1912) is in favor of early operation, especially when the cataractous changes are about equally developed in either eye and the patient is no longer able to follow his vocation. He considers the Smith operation difficult and unsafe.

In *Lyon med.*, 1912, No. 29, the same author recommends cyanid of mercury (1/2000) irrigations for three days before operating for cataract. By this procedure the conjunctival bacteria are destroyed and antitoxins formed within the eye.

A. C. S.

Extraction of Copper Splinters From the Vitreous.

v. Hippel (*Klin. Monatsbl. f. Augenh.*, July, 1912). Leber read a paper on this subject at Edinburgh in 1894, and v. Hippel, one of his pupils, reports a series of fifteen cases. Ten patients were operated on. Eight of these showed successful results. Of these eight, seven retained their eyeball with the following vision: 5/35, 1/25, 5/15, 5/20, 5/7; two had light-perception and projection. They were operated on from one day to ten months after the entrance of the splinter.

v. Hippel thinks the extraction can be successfully performed if we know at least approximately the location of the foreign body. A highly inflamed bulb is no contraindication for the operation, which, if done aseptically, does no harm.

M. W. J.

The Technic of Advancement of Eye Muscles.

Faschnig, Prag (*Klin. Monatsbl. f. Augenh.*, July, 1912). This operation is described in the second edition of Czermak's work on eye operations, and consists in fixing the muscle by

three sutures in the median line as well as above and below the cornea where the fibers of the superior and inferior rectus become fan-shaped. The operation is always done under local anesthesia.

The advantages of the operation are that no slipping occurs, and that the muscle becomes flattened out along its new attachment. By means of this operation the muscle length is impaired in the minimal degree and the rotatory power of the eye not interfered with. He disagrees, therefore, with Dimmer, who recommends a broad attachment to the bulb, induced by scarifying both the body of the muscle and eyeball.

M. W. J.

Tenotomy in a Hemophilic.

Berger (*Woch. f. Ther. u. Hyg. des Auges*, November 28, 1912). Some hours after a simple tenotomy in a five-year-old boy, examination revealed an enormous hematoma of the conjunctiva and orbit (external hemophthalmos). In spite of the continuous use of ice compresses, bleeding continued for three days, resulting in a profound secondary anemia, with thready pulse and subnormal temperature. On the fourth day the bleeding ceased. From this time on the patient made a rapid, uneventful recovery, and, according to the father's statement, two months later there was no squint. A. C. S.

The Therapy of Detachment of the Retina.

Birch-Hirschfeld, Leipzig (*Graefe's Archiv. für Ophthal.*, Vol. 82, Part 2), ends his exhaustive article with the following conclusions:

1. Twenty cases of spontaneous retinal detachment, including one case of sarcoma of the choroid, which had been treated unsuccessfully by conservative or operative methods, were treated by aspiration of the subretinal fluid, followed by injection of fluid through the retina into the vitreous, the fluid employed being either the subretinal fluid (Group 1, eight cases), or a mixture of subretinal fluid and .8 per cent salt solution (Group 2, five cases), or .8 per cent salt solution (Group 3, six cases).

2. In eight cases (four of the first, three of the second, one of the third group) a decided improvement with reattachment of the retina (retinitis striata), widening of the field and bettering of vision, followed.

3. In four cases there was slight improvement at the end of a year, in three cases no improvement, and in four cases a worse condition.

4. In six cases (three of the first and three of the second group) a more or less intense temporary inflammatory reaction followed the injection. In five of these, nevertheless, a marked improvement ensued.

These conclusions are based on observations extending over a year or more. A. C. S.

Detachment of the Retina.

Bettremieux (*Ann. d'Ocul.*, August, 1912; Abs. in *Woch. f. Ther. u. Hyg. des Auges*, November 7, 1912). In every case of detachment of the retina in which operation is indicated, he performs his sclerectomy simplex operation, once or several times, depending upon the result. He claims a number of cures by this procedure. By lowering the venous tension in the anterior portion of the uveal tract, the absorption of aqueous is facilitated and the circulation of the eye modified in a way reacting favorably upon the detachment. A. C. S.

Detachment of the Retina.

Fuchs (*Vienna Ophthalmol. Society*, February 27, 1911; Abs. in *Woch. f. Ther. u. Hyg. des Auges*, Nov. 14, 1912) advises careful scleral puncture without injuring the retina, followed by the introduction into the wound of a glass canula to the other end of which a rubber bulb is attached. The subretinal fluid is then aspirated. A. C. S.

Experimental Investigations Concerning Airol Therapy in Gonoblennorrhea.

Herreschwand, Innsbruck (*Graefe's Archiv. für Ophthal.*, Vol. 82, Part 2), finds that airol (bismuthoxyiodidegallate containing 24.8 per cent iodin) added to the culture medium in 1/10,000 concentration, completely checked the development of the gonococci. In contrast to the silver salts, the antiseptic action of the drug is enhanced by sodium chlorid and albuminous bodies. Under these conditions a concentration of 1/1000 suffices to kill the gonococci within half an hour.

The germicidal action is attributable in part to the dessicating action of the bismuth and to the astringent action of the gallic acid, but above all to the liberation of free iodin.

While the silver salts impair phagocytosis, airol brings about increased phagocytic activity. A. C. S.

Contribution to the Question Concerning the Etiology of Headache and Its Treatment.

Lorand (*Muench. med. Woch.*, No. 41, 1912; Abs. in *Woch. f. Ther. u. Hyg. des Auges*, November 21, 1912) is inclined to attribute headache to increased intracranial tension the result of disturbed cranial lymph and blood circulation. The treatment is based on the close anatomic relationship between the lymph and venous vessels of the nose and those of the brain coverings and diploe, consisting in the administration of a snuff powder to induce nasal drainage.

R

Menthol	.5
Acid. bor.	1.0
Irid. florent.	.....
Sacch. lact.	.....aa. 2.0

M.

Still more effective is the following prescription:

R

Pulv. mayoranæ	
Irid. florent.	1.0
Sacch. lact.	2.0
Rad. veratri alb	.14

M. f. Pulvis non subtilissimus. A. C. S.

The Effect of Dionin Upon the Pupil and Tension of Normal Eyes.

Toczyski, Lemberg (*Zeit. f. Augenheilk.*, Vol. 28, Part 1; Abs. in *Woch. f. Ther. u. Hyg. des Auges*, November 14, 1912), concludes that in the majority of cases dionin causes miosis followed by dilatation, the degree of miosis corresponding with the degree of chemosis. Dilatation is very slight and not dependent upon the duration of miosis.

Intraocular tension is increased during miosis. When dilatation occurs, tension may be either increased or normal.

A. C. S.

Adonidin.

Schidlowsky (*Arch. di Ottalmol.*, August, 1912; Abs. in *Woch. f. Ther. u. Hyg. des Auges*, November 28, 1912) finds a watery solution of adonidin (a glycoside of adonis vernalis)

of value in iritis and glaucoma because of its anesthetic and analgesic properties. Instillation of a 2 per cent solution will in twenty-five minutes result in complete anesthesia of the cornea and conjunctiva lasting three to four hours. A. C. S.

Nicotine Amblyopia.

De Weele (*Arch. d'Opht.*, 1911; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, November 28, 1912) reports marked improvement with restoration of the color sense from daily injections of ten centigrams lecithin. A. C. S.

Salvarsan.

Benario (*Muench. med. Woch.*, 1912, No. 40; Abs in *Woch. f. Ther. u. Hyg. des Auges*, November 7, 1912) discusses Vollert's contribution in which he reports three cases of choked disc following the injection of salvarsan. Vollert is inclined to blame salvarsan for this complication, but Benario's critical study of these cases leads him to ascribe the optic neuritis to insufficient treatment either with mercury or salvarsan. A. C. S.

On the Favorable Action of Salvarsan in Tabes.

Leredde (*Muench. med. Woch.*, 1912, No. 38-39; Abs. in *Woch. f. Ther. u. Hyg. des Auges*, October 31, 1912) believes that tabes is no parasyphilitic disease but truly syphilitic and therefore amenable to antisyphilitic remedies. He relies on injections of salvarsan or neosalvarsan. A. C. S.

Mikuliez Disease.

Aubineau (*Ann. d'Ocul.*, June, 1912; Abs. in *Woch. f. Ther. u. Hyg. des Auges*, November 21, 1912) reports a case in a young girl in whom radio and radium therapy resulted in a cure. A. C. S.

Disinfection by Suction.

Ohm (*Zentralbl. f. Augenheilk.*, March, 1912; Abs. in *Woch. f. Ther. u. Hyg. des Auges*, November 28, 1912) suggests the idea of a vacuum suction apparatus for the removal of ulcer detritus, lens substance after extraction, hemorrhage during sac extirpation, etc. A. C. S.

Concerning the Value of Yellow Shooting Glasses in War.

Ohlemann, Wiesbaden (*Woch. f. Ther. u. Hyg. des Auges*, November 7, 1912), disclaims the practical value to the soldier in war of tinted glasses such as Haitz and Schantz have recommended. Even ordinary glasses are more or less of a nuisance, being generally discarded, as the writer learned from actual experience in the Franco-Prussian war. A. C. S.

The Bjerrum Method for Examining the Visual Field and Results Obtained With It in Glaucoma.

Fleischer (*Klin. Monatsbl. f. Augenh.*, July, 1912) brings to our attention the above method, described by Bjerrum in 1889-92. It has been but little used in most of the German clinics, but has found much favor in England, Norway and Sweden. Whereas by the ordinary method with the perimeter the distance used is about 30 cm. and the 1 cm. test objects subtend an angle of 2 degrees, by Bjerrum's method objects 3 to 6 mm. in size at a distance of from 1 to 2 meters, i. e., subtending an angle of from 10 to 15 minutes, are used. A dark, flat surface is used. Bjerrum used a curtain, Fleischer a blackboard.

Fleischer calls attention to the value of this method in the study of glaucoma. Bjerrum proved that the glaucomatous field of vision did not show the earliest changes in the periphery but in the region of the blind spot, and Fleischer corroborates these findings after many years' experience.

A normal blind spot excludes glaucoma, according to these writers. As these changes in the blind spot occur before we can detect anything with the ophthalmoscope, the value of this method of examination is apparent. The scotometer of Priestley Smith, which has been devised for this method of examination, is in use in one German clinic at least, that of Prof. Axenfeld, and has given excellent results. M. W. J.

A New Method of Illuminating the Operating Field.

Stock (*Klin. Monatsbl. f. Augenh.*, July, 1912). This lamp has been used at Jena and has proven very satisfactory.

It consists of three tubes diverging from a common source of light. In each tube is an optical system and at the end a movable mirror. The three pencils of light are concentrated on the field from above, as the lamp is attached to a rod in

the ceiling. A very bright illumination is obtained with little heat, and the light is never in the way of the operator or assistant, and even if one pencil of light is cut off by part of the body of the operators or spectators, plenty of light still remains in the other two sources of illumination. M. W. J.

A New Eye Drop Bottle Which Can Be Easily Sterilized.

Goerlitz, Martin (*Klin. Monatsbl. f. Augenh.*, July, 1912). The bottle is so devised that during the sterilization, the dropper, turned at an angle of 90 degrees, is caught by projecting knobs a short distance before it slips into the air-tight mouth of the bottle. In this way steam escapes between bottle and dropper. M. W. J.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

M. W. Frederick, M. D.,

SAN FRANCISCO,

AND

Jesse S. Wyler, M. D.,

CINCINNATI.

Primary Melanosarcoma of the Iris.

Stephenson, Sydney, London (Sarcome mélanique primitif de l'iris, *La Clinique Ophtalmologique*, Vol. IV, February, 1912, p. 580), describes a sarcoma in a man forty-nine years old. The patient had been seen twice by Marcus Gunn, nine and three years before he came under Stephenson's care, and Gunn, although noticing a slight change in the choroid, had seen nothing in the iris. There is no history of lues or tuberculosis. In the lower part of the sinus of the anterior chamber is a small oval plaque of dark chocolate-brown color. The neighboring parts of the iris show no change, but the corresponding parts move very sluggishly. A few similar spots are distributed over the iris. In the fundus, two or three optic disc diameters below the optic disc, is an atrophic pigmented spot. There is a small spot of pigment in the eyebrow of the other eye. After a consultation with Tweedy the eye was enucleated, although the vision was 6/5. The microscope showed that some of the pigment cells had already invaded the ciliary body. M. W. F.

Serotherapy by Way of Mouth and by Local Applications—Conclusive Experiments of Ruppel.

Darier (Sérothérapie antistreptococcique par voie buccale et en applications locales. Expériences concluantes de Ruppel, *La Clinique Ophtalmologique*, Vol. IV, No. 3, March, 1912, p. 114) recalls the work of Spiess of Frankfort, who saw good

results from the introduction into the stomach of 25 cc. of antistreptococcic serum in infectious anginas, erysipelas, etc. No unpleasant reaction was ever observed. Voss also records that he has far fewer cases of mastoiditis to operate on since he has begun the early use of the serum by way of mouth. Darier would extend this use of the serum to a great number of infected conditions, amongst which iritis, corneal ulcers, and infections of the eye from trauma or operation are worthy of mention. The injection of serum sometimes gives rise to grave and alarming consequences, which are absent in the oral exhibition, so that one would be justified in using it in this way whenever there is reason to suspect an infection, thus saving much valuable time lost in making a bacteriologic diagnosis. He uses a mixture containing 20 cc. of antidiphtheritic serum (this being the most easily obtained serum), 30 gr. of syrup, 150 of water Of this a tablespoonful is given every hour. Ruppel has done the experimental work in animals, and has had very gratifying results, both from the internal administration of the serum and from the local application. M. W. F.

Preparatory Treatment of Tuberculous Dacryocystitis With Bismuth Paste.

Van Lint, M. (Traitement préparatoire, à la pâte au bismuth, d'une dacryocystite tuberculeuse, *La Clinique Ophtalmologique*, Vol. IV, March, 1912, p. 122). A girl, age fifteen years, had been treated a year previously for a mucopurulent dacryocystitis. Seven months later she reappeared with a fistula of the lacrimal sac, through which an abundance of mucopurulent secretion was being voided. Van Lint made the diagnosis of tuberculous dacryocystitis, and advised removal of the sac. This was deferred for another five months, by which time the edges of the fistula were badly frayed, so that an excision would have resulted in a marked ectropion. Van Lint judged it best to fill the lacrimal sac every other day with Beck's bismuth paste, with the result that in a fortnight the fistula had closed, thus allowing him to operate in sound skin. M. W. F.

The Treatment of Incipient Cataract.

Smith, Henry, Amritsur, India (Le traitement de la cataracte sénile commençante, *La Clinique Ophtalmologique*, Vol. IV, May, 1912, p. 234), gives some very remarkable results of the

subconjunctival injection of twenty minims of a 1/4.000 solution of cyanid of mercury. The first case in which it was used was a European lady, with incipient cataracts in both eyes. As the cataracts were not operable, Smith injected the cyanid in both eyes, and sent her back home. He was much surprised to learn that her sight had improved so much in a month that an operation was no longer asked for. After this he experimented on several other subjects, with great improvement of vision in most cases. The injection is very painful, in spite of the cocain, and an injection of morphin or a moderate general anesthesia is sometimes necessary. There is great tumefaction of the eye for several days. The improvement begins about the fourth day, and reaches its height at the end of a month. Most of the cases treated consulted Smith for the removal of mature senile cataracts in the other eye. He says that time alone will tell whether the improvement noted is permanent. M. W. F.

Measurement of Exophthalmus.

Rollet and Durand (Mensuration des protrusion oculaires, *Revue Générale d'Ophtal.*, May, 1912). There has been great need of a precise instrument to demonstrate the degrees of exophthalmus. One is easily deceived by the position of the lids and the degree of prominence of the eyes, especially in Basedow's disease, where it would be most convenient to regulate the effects of the therapy. It is also most interesting in cases of orbital tumor, strabismus, errors of refraction and other diseases of the eye. The authors desire to prove by their results a coexistence of exophthalmus and atrophy of the optic nerve, also a connection in the diagnosis of nephritis, and likewise in the prognosis. There have been numerous models of an instrument for measuring. The Helmholtz model is exact, but cumbersome and very complicated. The use of the Javal ophthalmometer for this purpose needs a special arrangement, and this is not portable. The instruments of Cohn, Emmert, Kayser, Volkmann, Zehender and Birch-Hirschfeld fail because you view the eye from the side, and it is impossible to replace the contrivance in exactly the same position when the other eye is viewed. Other exophthalmometers are described and criticized. The most perfect apparatus seems to be the model of Hertel, the second of his two devices. This consists of two mirrors at 45°, and standing before the patient with the exter-

nal bony orbital wall as fixation point, the tangent of the corneal apex is read off from a scale. It is not expensive, is compact and easily applied. However, the apparatus is not precise, since different observers get a variance of 1 to 3 mm. in their measurements. The authors have modified the Hertel instrument by adding two sights on a scale, one fixed, the other sliding. Upon applying, the sights are moved to mark the tangent to the apex of the cornea and the exophthalmus read off on the modified scale. The great objection to this measure is that the orbital wall, upon which the principle is based, is not a fixed point, the same in every case, but as a whole about as near as we can come at present.

After measuring two hundred normal eyes the authors hold that the average protrusion is between 12 and 14 mm., and that following extractions the figures do not vary. Exophthalmus is greater than 14 mm., enophthalmus less than 12 mm. All hypermetropes scarcely reached the lower figure; cases of myopia varied more, but showed the larger figure. After strabismus tenotomies we find a rapidly decreasing exophthalmus. Glaucoma shows no change in the position of the eyes.

Atrophy of the nerve in nineteen of twenty cases had protrusion up to nineteen, especially unexplainable in tabes. Several cases of Basedow's disease were followed and decrease seen. In chronic nephritis 78 per cent of cases examined had exophthalmus with bad prognosis. The authors recommend more frequent use of the instrument, which will ultimately give much information. J. S. W.

Value of Radiography in Searching for Intraocular Foreign Bodies.

Arcelin (Valeur de la radiographie pour la recherche des corps etrangere intraoculaire, *Revue Générale d'Ophtal.*, June, 1912) divides the subject into two large groups: those giving negative results, and those with positive findings. A radiographer must never send back word that there is no foreign body in an eye; rather "that the X-ray fails to show any substance which throws a shadow." He cites a case in which one of the best X-ray specialists in France failed to show a piece of steel, but the author made four successive pictures in different positions with positive results. Despite the utmost care in fixing the head of the patient, a slight movement of the bulb,

when the object is very small, may cause such a delicate shadow to be cast as to make the procedure useless. Thus Arcelin says it is extremely rash to pronounce finally that nothing is in the eye from a negative radiogram. When a positive finding is revealed, he uses the method of Grossman for localization, and maintains that you may be able to say if the object is in the temporal or nasal hemisphere, superior or inferior, but nothing more exact. (He does not seem to be acquainted with the exact methods of Sweet and our American writers.) The size of the foreign body cannot be estimated with any accuracy, although by conical projection and triangulation some idea may be gained. If, however, the body stands in an oblique plane a great difference is noted. As example, the shadow measurement gave size of an object to be 7 to 10 mm. and when removed was less than 2 mm. However in the majority of cases this estimation is perfectly useless as far as therapy is concerned. J. S. W.

Abscess of the Vitreous in a Diabetic Woman Suffering from a Furuncle of the Neck.

Peretz (Abscès du corps vitré chez une femme diabétique atteinte de furoncle à la nuque, *Revue Générale d'Ophtal.*, July, 1912) relates the history of a woman, sixty-three years of age, afflicted with diabetes for some time, who, while suffering from a boil on her neck, attempted to make a trip to the far East, and on the way developed a panophthalmitis. Because of other complications the disease was handled symptomatically for three months. When the author saw the case there was exophthalmus, ectropion and hypertrophy of the lower lids, great sensitiveness and increase of tension to + 3. The neck condition healed. Pain becoming great, an exenteration of the globe performed. Upon incision into the eye a pus similar to that of the furuncle welled out. Results of operation perfect.

This was a case of metastasis through the blood, and staphylococci were found as in primary infection. This finding of a metastasis from a local source is very rare, usually they are from puerperal infection, influenza, bronchopneumonia, etc. In panophthalmitis the operation of choice is evisceration of the bulb, the cauterization of de Lapersonne is not necessary. A simple incision into the bulb and allowing free evacuation of its contents, is a rapid, easy, and conservative method with good results and rapid recovery. J. S. W.

Mydriasis Due to Adrenalin.

Santos-Fernandez, J. (Mydriase due à l'adrénaline, *Revue Générale d'Ophtal.*, October, 1912) has been observing this condition since 1906, but did not care to discuss it prematurely. In daily practice he utilizes alypin and adrenalin together and found many dilatations of the pupil. This action has been explained by Cords, Loewi, Falta and Zak as due to a stimulation of excitable sympathetic nerves working upon the dilator fiber of the iris. The mydriasis is more pronounced when there is a break in the epithelial continuity. The author explains the action as that similar to atropin (absorption of the fluid and blanching of the vessels of the iris which will produce a widened pupil, directly the reverse of the myosis caused by uveal congestion). The following are the conclusions:

(1) Adrenalin mydriasis is not very frequent.

(2) It is more easily observed in a normal eye than in one with a serious lesion.

(3) The dilatation is hindered by combination with alypin and provoked by cocain.

(4) These ideas should be known to prevent the consequences of mydriasis and to study its origin.

(5) Adrenalin should only be used in ophthalmology for its blanching properties.

(6) Do not employ adrenalin in ocular therapy intravenously, as experiments on rabbits have demonstrated that it produces atheroma of the aorta similar to that brought about by any chronic intoxication.

(7) The main indication for the use of adrenalin is in operative work. J. S. W.

Visual Disturbances Following Direct Observation of the Last Eclipse of the Sun.

Valois and Lemoine (Troubles visuels consécutifs à l'observation directe de la dernière eclipse de soleil, *Revue Générale d'Ophtal.*, September, 1912), report their findings in eighteen cases of children or young people who observed the eclipse, April 17, 1912, without using protective glasses. The histories are tabulated at the end of the article. Depending upon the length of time exposed to the light, and whether one or both eyes were used, the symptoms vary considerably in degree, but are fairly constant in their presence. Victims complain first of

dazzling, then of a fixed spot which conceals objects in the center of sight. Others turn their heads to increase sight. The central scotomata have sharp edges and variable color, some black, green, red, or with variegated edges and points. Most often the spot is yellow and gives the symptom of xanthopsia. Next to the scotoma the amblyopia is second in frequency. This is variable in degree, but vision is always diminished, and even if normal will fatigue so rapidly as to bring out a most decided asthenopia. At first pupil shows a myosis which rapidly dilates, resulting in a mydriasis with diminished light reflex. Fundus is usually normal. Occasionally hyperemia of the disc or a wooly veiled appearance of retina. None of the eighteen cases had hemorrhages. Resolution was rapid, scotomata disappearing after a fortnight, in one case after a month; the amblyopia a little slower in leaving.

Treatment consists in darkened room and rest of the eyes. If symptoms persist, blood letting from temples or mastoid, mustard foot-baths and energetic purgation. Instillation of pilocarpin to reduce size of the pupil. After subsidence of congestion, if vision is still poor, can use strychnia hypodermatically. If a complete cure has not taken place in four or five months, potassium iodid is the only thing that may help.

J. S. W.

ABSTRACTS FROM SPANISH OPHTHALMIC LITERATURE.

BY

WILLIAM H. CRISP, M. D.,

DENVER.

Antiseptic Injections in the Treatment of Ciliary Blepharitis.

BLANCO, TOMAS, Valencia (*Archivos de Oftalmologia*, May, 1912). A one per cent solution of yellow pioctanin in distilled water was used. The syringe needle was inserted at two or three millimeters from the external canthus, and above or below this, according to whether the upper or lower lid was to be injected. The needle was carried through the tissues almost to the internal canthus, parallel with and about two millimeters from the ciliary border. The solution was then gradually discharged from the syringe as the needle was withdrawn, 0.5 ccm. being injected into each lid. For sensitive patients a few drops of four per cent solution of cocain may be added to the pioctanin solution. In some cases a single injection produced marked results, while in others several injections were required; but more or less decided benefit was obtained in the large majority of cases of glandular blepharitis, with or without ulceration. Success was little or none in squamous, hypertrophic, and seborrheic blepharitis.

Reflex Strabismus of Nasopharyngeal Origin.

SUNE Y MEDAN, LUIS, Barcelona (*Archivos de Oftalmologia*, May, 1912). A boy of nine years came on account of impeded nasal breathing. The surgeon noticed incidentally that there was a convergent strabismus, and was told that this had existed for some time and was accompanied by diplopia. Adenoid vegetations were removed, and when the boy was seen twelve days later the squint had disappeared, and the patient declared that he no longer saw double. The child was again seen five months after the operation, and up to this time the

ocular defect had not returned. In the literature of ophthalmology the writer could not find a reference to the various affections of the nose, accessory sinuses, and nasopharynx which are capable of producing oculomotor changes. He quotes Killian as to the good effect of an adenotomy on conjunctivobulbar affections which have resisted purely ophthalmologic treatment.

Treatment of Retinal Detachment.

Castresana, B., Madrid (*Archivos de Oftalmologia*, June, 1912). The author's clinical experience leads him to place the proportion of cases of retinal detachment occurring in myopic patients as high as fifty per cent. After reviewing various methods by which cure of this desperate condition is attempted, he gives preference to scleral puncture, combined with subconjunctival injections of a strong solution of sodium chlorid. A series of cases is described, in a large proportion of which more or less striking improvement of vision, enlargement of the visual field, and reattachment of the retina were obtained. The greater or lesser efficacy of the treatment is said to depend in the first place on the length of time for which the detachment has existed, and further on the strength of the solution of sodium chlorid and on the use of the scleral puncture. In simple detachments not older than ten days, the author has observed some cures, and at the least a great improvement of conditions. If the case is of very long standing, no result is obtained. The strength of the solution of chlorid of sodium should not be lower than twenty nor higher than thirty per cent. A weak solution does not set up sufficiently active endosmotic and exosmotic currents in the eyeball; and, on the other hand, a concentrated solution, thirty-three per cent, produces very violent reactions, even to the point of an iritis. The scleral puncture serves not only to let out the serous fluid underlying the retina, but favors more direct relations between the salt solution and the subretinal fluid. The author regards the internal use of iodids, and confinement to bed for eight or ten days, as important auxiliaries to local treatment. He accepts the theory of Jocqs, that the favorable action of the saline solution is due to osmotic changes.

Some experiments with rabbits are described, in which, retinal detachment having been artificially produced, a com-

parison of the results obtained in the eyes injected with strong salt solution with those in eyes not so treated was markedly in favor of the saline injections.

Homonymous Hemianopsia from Metrorrhagia After Premature Birth.

García del Mazo, J., Madrid (*Archivos de Oftalmologia*, June, 1912). A woman of thirty-three years bled profusely at and two hours after a premature birth. She became unconscious and for the next fifteen days suffered from loss of memory. Thirty-five days after the labor she came for examination on account of not seeing objects located to her left side The visual fields were homonymously hemianopic. The fundus showed no lesions. After seven months the condition of the visual fields was the same. The writer regards the disturbance as due to hemorrhage or vascular thrombus in the optic centers or tracts.

Superficial Posterior Crucial Sclerotomy.

Wicherkiewicz, Cracow (*Archivos de Oftalmologia*, July, 1912). This operation is designed for the treatment of glaucoma. After subconjunctival injection of a solution of novocain and adrenalin in the upper outer quadrant, and as far back as possible, the lids are strongly separated. By means of a crochet hook the assistant fixes the eye above the cornea and turns it down as far as he can. The conjunctiva having been incised with a Graefe knife in a meridional direction, the subconjunctival tissue and capsule of Tenon are divided and pushed back from the sclera. A few drops of adrenalin are instilled, and when the hemorrhage from the enlarged ciliary vessels has been checked, from four to six incisions are made in a meridional direction, each ten to twelve millimeters long, and into but not passing completely through the sclera. Similar incisions are then made crossing the first at right angles. Finally, if the tension of the eye has been very high, one of the incisions is slowly deepened until it reaches the choroid but without wounding that structure, and for a length not exceeding three or four millimeters. The field of operation is douched with boric acid solution, and the conjunctiva and capsule of Tenon closed with two or three sutures. During the process of healing it is important to use massage, especially if the incision reaching down to the choroid has not been made. The author

relates a series of cases in which the operation was generally followed by improvement of vision, increase in the visual field, and lowering of tension. He has done the operation one hundred times, over a period of four years. He concludes that the operation is without danger; and that it is indicated above all in simple glaucoma, in hemorrhagic glaucoma, and in all cases unsuccessfully operated upon by iridectomy or other procedures aimed at the anterior excretory channels.

Persistent Conjunctival Hyperemia After Cataract Extraction.

De Obarrio, P., San Francisco (*Anales de Oftalmologia*, July, 1912). Attention is called to "certain disturbances of vasodilator origin and obstinate in character, which appear immediately after surgical intervention and exist for an indefinite period." Pain is usually lacking. The condition occurs where the operation has been quite uncomplicated, and where in consequence the bandage has not been removed until the third day. The corneal wound appears normal and the patient is comfortable, but there is an alarming redness of the conjunctiva. Treatment lasting several days is often without result. The writer has had a series of six such cases, which he describes, in which, after looking in vain for an explanation of the eye condition in the ear, nose, throat, or other parts of the body, the fault was found to lie with diseased teeth. The offending teeth were in each case bicuspids or molars on the same side as the eye which had been operated upon; and removal of the carious teeth or roots was in each case followed by speedy recovery from the conjunctival disturbance. The action of these teeth is probably by way of the nervous system through the Gasserian ganglion.

Salvarsan in Ophthalmology.

Alonso, Antonio F., San Luis Potosi (*Anales de Oftalmologia*, August, 1912). A case of intense iritis was completely cured in eight days after intramuscular injection of 0.6 gm. of salvarsan, injections of benzoate of mercury having produced only partial improvement. The course of a case of parenchymatous keratitis was apparently not changed by a similar dose. A case of specific retinochoroiditis resisted intramuscular injections of both benzoate of mercury and salvarsan. Another case of severe iridocyclitis yielded to two doses of salvarsan of

0.4 gm. each. A tabetic optic atrophy was neither helped nor harmed by an injection of 0.3 gm. of salvarsan, although the patient's gastric crises seemed to be somewhat lessened in severity.

Family With Hereditary Chorioretinitis.

Lutz, Anton, Havana (*Anales de Oftalmologia,* August, 1912). An abstract of this report, from the German, appeared on page 134 of last volume of the Annals of Ophthalmology.

Armed Psychotherapy in Hysteric Eye Conditions.

Gonzales, J. de J., Leon (*Anales de Oftalmologia,* September, 1912). In a case of hysteric amblyopia with micropsia, contraction of the visual field, and inversion of the normal interrelation of the color fields, cure was obtained by reeducational exercises in reading, with the chromatoscope and campimeter, and in appreciation of size with the help of the sense of touch. A case of extreme hysteric hyperesthesia of the retina, with cyanopsia and severe blepharospasm, yielded to the combined physical and psychical effect of cocain, reeducational exercises in raising the lid, and use of the positive pole of the galvanic current. A case of hysteric blepharoptosis was remarkable in that the inability to raise the lids was apparently paralytic. The lids were perfectly relaxed and could be easily raised with the finger. The repeated use under cocain of a lid speculum through which was passed a mild faradic current, resulted in restoration of function. In another case of hysteric ptosis the lids could be easily raised with the finger, and then remained open while the eyes were examined, the patient unconsciously blinking in the meantime. The treatment consisted in reeducation in raising the lids, with the aid of the surgeon's fingers, and light faradization.

The Correction of Bioblique Astigmatism.

Ribas, Valero (*Archivos de Oftalmologia,* August, 1912). The author refers to the fact that the meridians of maximum and minimum curvature of the cornea, as measured with the ophthalmometer, are not always at right angles with one another. Thus the correction of these cases with a cylindric lens will be merely partial and approximate. Three illustrative cases are given, the principal axes in which were respectively at 155 and 100, 100 and 30, and 155 and 90 degrees. The author's

suggestions for the treatment of such cases resolve themselves into finding the lens which gives the best vision.

Hemophilia (?) in Patient Operated Upon for Cataract.

Buades, J. (*Archivos de Oftalmologia*, August, 1912). Fifteen minutes after completion of the operation the bandage was seen to be blood-stained. The conjunctival sac was found to be filled with blood, which was partly coagulated. The anterior chamber was also full of blood, which issued in a fine stream through the corneal wound. The iris, which had been left intact, was prolapsed. The blood stopped after an hour of hot fomentations, associated with hypodermic injection of ergotin. Although the patient was fifty-five years old, the author suggests the possibility of a hemophilic etiology.

A Rare Case of Strabismus.

Galiana, F., Madrid (*Archivos de Oftalmologia*, September, 1912). The patient's left eye was blind. The right eye had vision of 1/10; the temporal half of its optic disc was atrophic. The blind eye approximately fixed in all directions, there being only a very slight upward turning. The seeing eye, on the other hand, was turned strongly inward. The atrophy of the temporal side of the disc of the seeing eye of course involved the macular region, so that this eye converged in order to receive visual impressions upon that part of its retina which still functionated.

Hydatid Cyst of Orbit.

Redondo Llerandi, A., Madrid (*Archivos de Oftalmologia*, September, 1912). For eight years the patient had noticed a ptosis of the left upper lid which interfered with direct forward vision. In December, 1911, there occurred severe pains, accompanied by loss of vision and a slight ophthalmia. A large swelling occupied the upper inner part of the orbit. The upper lid covered the greater part of the cornea. The eyeball was protruded and displaced downward and outward. The cornea was extensively ulcerated and the iris prolapsed. Exploratory puncture yielded fluid in which were found the scolex and segments of tenia echinococcus. The cyst contents were aspirated, and a 1/1000 solution of corrosive sublimate injected. After three days, the cavity having been incised, expression and forceps brought away the cyst membrane.

A New Defect in Refraction—Biastigmatism.

Marquez, M., Madrid (*Archivos de Oftalmologia,* September, 1912, p. 474). Since a communication to the International Ophthalmological Congress at Naples, 1909, regarding his "discovery," he has observed sixty cases. The "discovery" is that the principal axes of corneal and lens astigmatism are not necessarily either identical or at right angles with one another. Where they are not thus related, he asserts that the condition, which he calls "biastigmatism," will require two cylinders for its correction; though he admits that in some cases one lens of intermediate axis may fulfill the purpose.

SOCIETY PROCEEDINGS.

BY

ARTHUR J. BEDELL, M. D.,

ALBANY.

SECTION ON OPHTHALMOLOGY

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting October 17, 1912. Dr. William M. Sweet, Chairman, presiding.

A New Prism Test for Muscular Imbalance.

Dr. J. Thorington described a truncated prism as "a cone or pyramid whose vertex is cut off parallel to the base by a plane." The truncated prism is accurately ground to 7 centrads each, with a space of 3 mm. of plane surface between the bases. These prisms are made of ruby-red, cobalt, or colorless glass. The difficulty frequently experienced in the use of the Maddox double prism of colorless glass, to have the patient tell promptly whether the fixing light is closer to the upper or lower image in testing for hyperphoria, has prompted the author to propose and use a truncated prism as just described. With this prism the patient sees three images connected by a band of light, with one eye, namely a central light with one image above and another below at a corresponding distance. The position or location of the light as seen by the fixing eye in its relative position to the streak and three lights is easily defined by the patient, and the diagnosis of the variety of the insufficiency promptly made.

Dr. Holloway stated that in using the Maddox double prism test for near, he often experienced considerable difficulty in having the patient see the three dots. He inquired of Dr. Thorington whether he thought this modification would tend to eliminate this difficulty. Personally, he preferred the Maddox

rod and the small black screen with central opening, such as had been designed by Dr. Baer.

Dr. Hansell said that a new test that will rapidly and accurately determine orthophoria and low degree of heterophoria is to be desired and will be welcomed.

The device of Dr. Thorington has the advantage over the Maddox double prism in that it creates a third light, seen through the plane surface of the thromboid prism, which helps to distinguish between the false and true images. The test light should be, as in most of the tests, small, and not too bright.

Dr. Hansell has used in his own work the Maddox rod to detect small variations, the cobalt-blue glass for defects of a little higher grade, and the red glass for the highest degrees, including diplopia. He prefers the deforming tests rather than those that displace the image, because they are less confusing to the patient, and in the cases of patients who neither observe accurately or express themselves definitely, the simpler the tests and the more easily they are understood the better the results.

Dr. Ziegler thought that any addition to our tests for muscular insufficiency should be welcomed. It seems possible, however, that this three-light test might confuse the patient. He used the 6° double Maddox prism about fifteen years ago, but abandoned it for the old Graefe test, made with his illuminated Greek cross test-object, which is more accurate and less confusing. He had presented a description of that test before this Section last year. He still uses the Maddox prism, however, to cause monocular diplopia in tests for malingering.

Dr. Carpenter called attention to the original Maddox prism, which was practically useless because the strength of the prisms —three degrees—was insufficient, permitting the images to fuse. The instrument of Dr. Thorington seems very satisfactory, containing as it does prisms of seven degrees, thus overcoming this objection.

Dr. Zentmayer said that he had long ago given up displacement tests for determining muscle imbalance. He uses the Maddox rod both for distant and near tests. As control tests he employs Duane's parallax test (which, however, he finds time-consuming and difficult of comprehension for the average patient), and the following test, which is capable of uncovering the smallest errors: A cobalt glass is placed in front of one eye,

the other eye remains uncovered, and fixes a distant light. A card is held in front of the cobalt glass, and after thirty seconds is slowly withdrawn perpendicularly to the line of fixation; as soon as this line is past, if there be heterophoria, two lights will be seen, one of natural color, the other of cobalt.

Dr. Thorington, replying to Dr. Carpenter's question, said that the double prism which he has just shown is composed of prisms of 7 centrads each. He remembered hearing Dr. Carpenter make the remark several years ago, when they were associated at the Polyclinic, that patients could frequently fuse the images produced by weak prisms held with their bases in the horizontal meridian, and he was therefore guided in having the double prisms made of medium strength.

Replying to Dr. Holloway's question, he said that he used his double prism as a near test for imbalance, but not with the extreme satisfaction as when testing insufficiencies at 6 meters.

Burn of the Eyeball from the Explosion of a Zodiac Golfball.

Drs. J. T. Carpenter and B. F. Baer, Jr., exhibited a patient, who, on August 4, 1912, received a severe burn of the left eye following an explosion of a Zodiac golf ball, the core of which consists of a putty-like material possessing strong caustic properties.

The patient was first seen by Dr. Carpenter two hours after the accident, and presented the following condition: The left eyelids were swollen and reddened, the entire bulbar and palpebral conjunctiva transformed into gray sloughing tissue, the cornea, except the upper fifth, opaque and milky, chemosis so great that the lids failed to cover the protruding conjunctiva. The vision was reduced to counting fingers. Treatment consisted of atropin, dionin, holocain, ice, and later hot compresses. At the end of two weeks there developed a severe iridocyclitis, with hypopyon and necrosis of the lower corneal quadrant. The patient was admitted to the Bryn Mawr Hospital.

Following the recession of the iridocyclitis a third stage of the process began—gradual failure of nutrition in the anterior ocular segment—the cornea being covered with superficial blebs, the episcleral tissues pale and cicatrized, and the corneal parenchyma so densely opaque that vision was only about 1/60. At this time, six weeks after the injury, subconjunctival salt

injections were begun, a large quantity of normal salt solution being injected on every third day. The effect was so remarkable that but four injections were required. The eye which had shown no tendency to react to any treatment promptly responded to the salt injections, and is today quiet, the cornea so clear that vision with a plus 1.75 sphere is 6/6, the pupil widely dilated, and there is a complete absence of subjective symptoms.

Drs. Mevay and Frisch, of Atlantic City have under their care a boy who met with a similar accident in May, and whose eye today is still inflamed, irritable and visually useless. We have heard of three other accidents from the explosion of Zodiac golf balls, but as yet have been unable to get the details.

Burn of the Eyes Following Explosion of Golfball.

Dr. H. Maxwell Langdon cited the following history: W. B. was admitted to the wards of the Presbyterian Hospital on June 28, 1912, with the history that one hour before, while opening an English Zodiac golf ball, it suddenly exploded, the contents of the core being thrown in his eyes. The right eye showed decided chemosis of the conjunctiva, and a general roughening of the corneal epithelium. The left eye had lost the epithelium from the lower third of the cornea, the remaining portion was rough, taking fluorescin stain, and the conjunctiva was so chemosed that the lids could not close. The cornea was quite hidden until the conjunctiva was pushed aside with a spatula.

He was placed in bed, and ice compresses, and atropin were used; in twenty-four hours the chemosis was much less, and, on account of the condition of the cornea and the large masses of subconjunctival exudate, heat was used instead of ice. The condition gradually improved, and in two weeks he was discharged, with a vision of 5/8 and 5/6 in O. D. and O. S., respectively. The last ten days he was on dionin, which hastened the absorption of the subconjunctival exudate very decidedly.

He has two small scars near the lower margin of the left cornea, and a small traumatic pterygium to the nasal side of the left cornea.

The core of the English Zodiac golf ball is a small rubber bag filled with a grayish paste, which is strongly alkaline in reaction.

Unusual Type of Family Cataract.

After referring to some of the unusual types of congenital cataracts that have been recorded, Dr. T. B. Holloway cited the history of a single woman, aged twenty-eight years, who had consulted him for refraction. Upon examination the following unusual lenticular changes were found:

By oblique illumination there could be seen in the right lens, situated near the anterior capsule, an irregular central opacity, grayish in color, and at certain points presenting a faintly bluish tint. Thickly scattered throughout the anterior layers and extending as far as could be seen through the undilated pupil, were numerous irregularly rounded small dots, presenting a delicate blue tint. With the ophthalmoscope the central opacity and finer dots were much less pronounced. At the posterior pole could be noted a small comma shaped opacity with the same surrounding dots. These finer opacities appeared to extend to the very periphery of the lens in the posterior layers. Apparently the nucleus of the lens was not involved. The left lens presented similar changes, except that the central anterior opacity assumed a different shape. Aside from the lenticular changes and a high astigmatic error the eyes were normal.

There were but three children in the family, and subsequently an older brother, aged thirty-one years, and a younger brother, aged twenty-four years, were examined. Both had similar lenticular changes, but less pronounced than in the sister. An examination of the father, aged fifty-four years, and of the mother, aged fifty years, failed to detect any changes similar to those seen in the eyes of the children.

Dr. Holloway stated that these cases conformed to the type of cataract that has been described by Hess in Graefe-Saemisch, except that Hess described some very small brownish dots interspersed between the larger rounded bluish-gray dots.

T. B. Holloway,
Clerk.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of October 19, 1912. Dr. Edward Jackson presiding.

Traumatic Iridodialysis.

Dr. H. R. Stilwill presented a man aged thirty-five years whose right eye had been struck with a whip lash nine days previously. The blow had cut through the outer end of the upper lid, and reached the eye three mm. to the temporal side of the cornea. There was a large iridodialysis on the temporal side, and there had been extensive hemorrhage into the anterior chamber, which was clearing up. Vision had improved from shadows to fingers at three feet. There was some vitreous haze and also floating opacities. Was the lens affected and what was the prognosis of the case?

Discussion.—Dr. Black: These contused wounds of the eye are often more significant than punctured wounds. Their liability to low-grade iridocyclitis makes prognosis uncertain.

Dr. Coover's experience was that in time the lens became cataractous.

Dr. Sedwick cited the history of a case in which needling of the cataract had been followed by pretty good vision.

Dr. Walker referred to a patient aged 19 in whom cataract had shown earlier than the present stage of Dr. Stilwill's case. He did not look for lens disturbance in this case, and would give a good prognosis.

Dr. Hilliard would use dionin.

Dr. Aufmwasser had obtained vision of 20/100 after two needlings in a patient who would not stay for complete treatment.

Dr. Jackson had lately seen a boy whose right eye had been struck on September 28th by a No. 4 duck shot from a spring gun. Vision had improved from light perception to 4/5 part, and the eye was clearing up nicely under atropin. The dialysis was above, the shot having hit the eye several millimeters above the limbus.

Cyst of Accessory Lacrimal Gland.

Dr. H. Aufmwasser presented a woman of twenty-one years who two months earlier had noticed a swelling in the right

upper lid near the external canthus. For four months she had been aware of a chalazion towards the nasal end of the same lid. On turning the lid and having the patient look down, a transparent cyst the size of a large pea came into view. The cyst originated probably from an accessory lacrimal gland.

Discussion.—Dr. Walker would split the external wall of the cyst and then thoroughly curet the interior to set up an adhesive inflammation.

Dr. Bane favored shelling it out with a pair of curved scissors.

Drs. Black and Jackson thought the cyst of lacrimal origin.

Magnet Extraction Through Scleral Incision.

(a) Dr. Edward Jackson presented a patient, from the practice of the late Dr. E. W. Stevens, in whom a piece of steel had passed through the iris, and the anterior and posterior portions of the capsule of the lens, and had hung suspended in the vitreous a few mm. back of the lens. The foreign body was extracted after twenty-four hours, but a severe iridocyclitis lasted eight weeks. The only trace of this, however, was now a rather broad adhesion of the iris at the temporal edge of the pupil. There was a limited opacity deep in the lens, which was otherwise clear. There was a considerable degree of astigmatism. Extraction was done through the sclera.

(b) Dr. Jackson presented the patient in whom he had first made use of scissors, in contact with the magnet and with their points in the vitreous, to extract a piece of steel. (Proceedings Colorado Ophthalmological Society, October 17, 1907.) Extraction was not performed until more than five months after the injury. The foreign body was only obtained after a number of snipping movements of the scissors while in contact with the magnet. Tonight, with correction of a compound myopic astigmatism, vision was 4/4 part in this eye.

(c) Dr. W. H. Crisp presented a patient from whose right eye a piece of steel had been removed through a scleral incision, nine days after the injury. In this case, as in the two cases reported by Dr. Jackson, a hand magnet was used. The foreign body had penetrated apparently in the region of the suspensory ligament, and the lens was uninjured. The eye had developed a moderate amount of compound myopic astigmatism, on correction of which vision was now, over three months since operation, 5/4 part.

Discussion.—Dr. Black referred to a case in which, after repeated attempts at extraction with a giant magnet, the patient feeling pain with each application, skiagraphy showed the foreign body to be outside the eyeball in the orbit.

Dr. Jackson had had a shot case in which blindness had occurred from the moment of the injury, and after enucleation the shot was found in the optic nerve.

Dr. Neeper spoke of a case in which, although the foreign body was located in the orbital fat and the vision remained normal for some time, yet a year or two later the lens had become cataractous.

Dr. Walker had succeeded in extracting with the magnet a large piece of steel which the skiagraph had shown as above the orbit in the cranium.

Dr. Patterson having raised the question as to whether it was better to extract through the sclera or through the lens, Dr. Walker remarked that each case should be judged on its merits, it being remembered that if there was already an injury to the lens it was not desirable to make a second opening through the sclera.

Papilloma of Conjunctiva.

Dr. Melville Black reported the history of a case of papilloma of the conjunctiva, about the size of a pea, occurring just external to the caruncle, in a man of forty-five years. The growth was excised with some surrounding conjunctiva, and the diagnosis confirmed by pathologic examination. What was the experience of members with regard to recurrence of such growths?

Discussion.—Dr. Coover referred to a case already reported, of a large growth involving both the cornea and conjunctiva. He had carefully curetted after removal of the tumor and believed this was the secret for avoiding recurrence. In another case a second operation had been necessary, apparently because the surgeon who did the first operation had not curetted.

Dr. Jackson: These growths sometimes become epitheliomatous if neglected, or may be really epitheliomatous from the beginning.

Interstitial Keratitis.

Dr. Patterson reported the case-history of a woman, twenty-seven years of age, in whom an apparent episcleritis had dis-

appeared under salicylates, to be followed a month later by a bilateral and rapidly progressive interstitial keratitis. The Wassermann test being positive, she was put on mercurial inunctions. The injection and photophobia had gone, but the infiltration had not diminished. Was it advisable to follow the mercurial course of "606"?

Discussion.—Dr. Sedwick mentioned a case in which interstitial keratitis had come on after the administration of "606." But the drug had not been given by one expert in its use

The general opinion of the members seemed to be that there was no considerable prospect of gain from the use of salvarsan in this condition.

Meeting of November 16, 1912. Dr. David H. Coover presiding.

Corneal Staphyloma.

Dr. D. A. Strickler presented a case of corneal staphyloma in a child of five months, due to ophthalmia neonatorum beginning eight days after birth. The parents were free from gonorrheal infection, but it had been found that the grandmother, who had acted as nurse, had a gonorrheal cystitis. One eye only had become infected. Section of the cornea had been done in the hope of saving the eye, and there had been no prolapse of the iris. The family physician asked for suggestions as to future treatment. A pressure bandage had been tried, but the eye was increasing in size.

Discussion.—Dr. Ringle thought the iris involved, that the staphyloma would increase, and that it was a case for enucleation.

Dr. Walker would try to clear up the cornea with a view to slight chance of future optical iridectomy.

Dr. Bane suggested trying to establish drainage, and trephining was mentioned. Dr. Coover had trephined in a case of staphyloma, entering the vitreous chamber, with some escape of vitreous. The cornea became flat.

Dr. Jackson. If the eye did not become decidedly worse it would be better not to interfere for two or three years, so as to favor normal development of the orbit. Pressure was not likely to help, and if excessive might cause the cornea to break down. He had never seen any good result from iridectomy after ophthalmia neonatorum.

Hyalitis With Probable Chorioretinitis.

Dr. D. A. Strickler presented a woman who had consulted him four days ago on account of rapid loss of vision in the right eye. The vision had been reduced to shadows. At first there was no fundus reflex. The cornea was of ground glass appearance, and tension was definitely increased, but the pupil was rather smaller than that of the other eye. There was a faint pericorneal flush. She had had no pain. The maternal grandfather and grandmother had both died of tuberculosis. She had been under treatment two years earlier for blurred vision, and had at that time floating opacities in the vitreous and an obscuring of the fundus details for some time. The left eye showed choroidal atrophy close to the disc, with a good deal of pigmentation. Today there was a decided fundus reflex in the right eye, and floating opacities could be well made out in the vitreous. No fundus details could be recognized, but there was seen indistinctly a large white area. The tension of this eye with the Gradle tonometer was: Right, 52. Left, 25 mm. Hg.

Discussion.—Dr. Libby mentioned the case of a woman of sixty-four years, seen by him during the past week, whose family physician reported that, having found the tension increased, he had used atropin to reduce it!

Dr. Walker thought Dr. Strickler's case one of cyclitis or choroiditis in which increase of tension was caused by blocking of the excretory channels by inflammatory products.

Dr. Jackson suggested that the white space or mass indistinctly seen in the fundus pointed to a choroiditis. As bearing on the hazy cornea and increased tension, he described a case recently seen by him, of probable tubercular nature in which glaucomatous symptoms had occurred. Two years ago the young woman, who then lived in Pittsburgh, had a similar attack, the cause of which was not clearly understood, but which left a good deal of choroidal atrophy and macular pigmentation. A month or so ago she noticed that the central scotoma had increased in size. The retina and vitreous were hazy, but this had cleared up, and there was now a new spot of partial atrophy near the old one, the retina apparently being also affected. Von Pirquet's test was positive. At the same time there was a probable tuberculous disturbance of the great toe. Shortly after the diminution of vision was noticed, the

tension was + 1, and with the Gradle-Schiötz tonometer 50 or 60 millimeters Hg, and the pupil was a little dilated. A miotic brought the pupil down and reduced the tension, which was now normal. The lesion was going on to a condition of choroidal atrophy. Dr. Jackson suggested the use of pilocarpin in Dr. Strickler's case.

Dr. Hosmer thought the detailed pattern of the iris was a little indistinct.

Acute Conjunctivitis.

Dr. D. A. Strickler presented a man of twenty-three years, who had been suffering from a severe conjunctival disturbance. There had been extreme photophobia, a copious gush of tears every time the lids were separated, severe pains often preventing sleep, injections and swelling of the lids, and a crescentic, rather deep, and clear cut ulcer at the sclerocorneal margin. There was a slight clouding of the upper part of the cornea. The ulcer had been scraped and afterwards cauterized. A smear from the scraping showed only a few diplococci and staphylococci. Atropin had given great relief, the photophobia was less. The tears did not seem to be stained with pus. Was there any probability of a diagnosis of trachoma in the case?

Discussion.—Dr. Jackson thought it looked as though it might be an early acute trachoma. The tears often washed away more mucopurulent material than was realized.

Dr. Hosmer suggested the use of solid sulphate of atropin on account of the difficulty of dilating the pupil in the presence of so much lacrimation.

In reply to a question by Dr. Bane, Dr. Strickler stated that there was very general congestion of the interior of the nose.

Dr. Monaghan thought constitutional treatment indicated.

Dr. Crisp referred to a case in which marked edema of the lids had for some time masked the diagnostic signs of an acute trachoma. There was profuse seropurulent discharge, and there were small corneal ulcers near the limbus. The patient was kept awake a good deal at night by the pain.

Dr. Coover would use one or two per cent ichthyol in the form of an ointment.

Dr. Ringle stated that in conjunctival affections complicated by corneal ulceration he employed two per cent silver nitrate, neutralizing with salt solution.

Dr. Walker: When there was no lid trouble he had the most gratifying results from touching the ulcerated surface, after cleansing, with nitrate of silver once daily, in two per cent solution. He thought it the ideal treatment.

Loss of Sight in Infancy Without Apparent Cause.

Dr. Conant reported the history of a child of four years, in one of whose eyes vision was entirely lost, probably from an early panophthalmitis. The iris and cornea were in apposition. The vision of the second eye was now failing. The child could make out a 2-inch object at about eight feet. The ophthalmoscope did not show any gross lesions. There was no history of any eye trouble in the family, except that an older brother showed scars of choroiditis.

Dr. Walker was reminded of a case in which the sight of the second eye had begun to fail without apparent cause. The first eye, which had had an ulcer originally, had now no perception of light, and its enucleation was advised. On removal the whole choroid was found to have turned to a bony formation, and the lens was stony hard. No further complaint was made of the second eye. It was apparently a case of sympathetic irritation, and Dr. Conant's case might be due to a similar degenerative condition.

Dr. Coover suggested the use of the X-ray to investigate possible sinus involvement.

Dacryocystitis Neglected Twenty Years—Prompt Cure by Simple Irrigation.

Dr. G. F. Libby reported the case of a man who for twenty years had been regularly squeezing out the pus which collected in a diseased lacrimal sac. For the past two weeks the condition had been treated by simple washing of the sac and subsequent filling with 25 per cent argyrol solution, and at the time of reporting, the discharge had entirely ceased. The punctum had been gradually dilated with a Ferguson dilator, without slitting the canaliculus. The argyrol solution now passed through into the nose. The argyrol was not used until twenty-four hours after the punctum was dilated, because of the possible risk of staining the deep tissues.

Dislocation of Lens by Needle.

Dr. J. W. Lehan reported the history of a boy whose eye had been injured by a needle three or four months ago. The pupil was displaced upward and inward, and the lens cataractous, and dislocated partly into the anterior chamber. There was some light perception, and the eye was soft.

Discussion.—Dr. Ringle thought that the lens ought to be extracted.

Dr. Walker referred to a case in which, the lens being dislocated upward, the corneal incision was made below, and successful extraction done with a vectus.

Cataract Extraction in a Case of Paralysis Agitans.

Dr. C. A. Ringle reported the history of a farmer aged fifty-eight, who came on account of bilateral cataract which had reduced vision to light perception, but who at the same time was suffering from paralysis agitans. In spite of the poor vision, the cataracts were immature. The eyes appeared to be otherwise normal, but examination was made extremely difficult by the marked muscular tremor produced on attempting to hold the eyes open. On account of the usual objections to general anesthesia in cataract extraction the first attempt at removal of the lens was made after administration of a quarter of a grain of morphin and a hundredth of hyoscin hypodermically. The muscular tremor and spasm were apparently quieted, and the patient was sound asleep soon after getting on the operating table. But when spoken to he would arouse, and would turn his eyes in any required direction. The eye was cocainized, the speculum inserted without resistance, and iridectomy and capsulotomy performed without incident. But as the spoon and spatula were being taken in hand, there was a sudden gush of fluid vitreous. At the command to keep still and not squeeze the eye, there were repeated spasms of the orbicularis. The speculum was at once removed, and, as the slightest disturbance caused the patient to squeeze the eye shut, a dressing was applied. It was impossible to examine the eye until ten days after operation, when ideal healing was in progress, and the lens was seen to be in position, but its opacity markedly increased. After six weeks a second attempt was made, a hypodermic injection of

morphin and hyoscin being given, and deep anesthesia completed by means of a few drops of chloroform. A perfectly straightforward extraction was done without loss of vitreous. There was no nausea after recovery from the anesthetic, and six weeks after the second operation vision of 20/70 was obtained.

Discussion.—Dr. Bane had had a similar case with expulsive hemorrhage following extraction.

Dr. Strickler mentioned that it had been advised to give half of the dose of morphin and hyoscin an hour or so before, and the remainder shortly before operation.

Meeting of December 21, 1912. Dr. Charles A. Walker presiding.

Anterior Scleral Trephining for Glaucoma.

Dr. D. H. Coover presented a woman of forty years, who on August 22, 1912, had come with the usual symptoms of acute glaucoma. Tension was then + 3, or with the Schiötz tonometer 60 mm. of Hg. Vision = 5/60. Six weeks earlier she had been hit in the eye with a piece of wood, and several glaucomatous attacks had occurred. Eserin produced an improvement in tension and vision. On August 26th she came back, having had several further attacks, and with vision reduced to light perception. Tension was + 3. Anterior scleral trephining was done. By August 30th the vision had improved to 6/30. On September 2nd vision was 6/15 and tension minus. On September 10th vision was 6/12 minus. September 12th a boy was killed near her house, causing considerable mental shock, and the next day she came to the office with vision of 6/20 m. Tension (Schiötz) was 35 mm. In a few days her vision returned to 6/12, and now with a + 1 cyl. axis 90° she has 6/6.

Dr Coover also presented an elderly woman who was before the society in December, 1911, to show the effect of a trephining operation for relief of pain in absolute glaucoma. A marked cystoid cicatrix still persisted at the site of operation; tension minus; no discomfort.

Dr. Melville Black reported the case of a man fifty-five years whose right eye became inflamed and painful a few days after a blow. The general physician prescribed atropin. Three weeks later the cornea was steamy, the pupil dilated, and tension + 2. After using eserin for five days without result, tre-

phining was done, the conjunctiva being dissected back to the cornea, and the von Hippel trephine used, as modified by Fox. A small hole was made in the protruding iris, and the conjunctival flap sutured in place. Tension became considerably below normal, but had increased and was now slightly minus. The eye looked normal, but had no vision and no fundus reflex was obtained.

Dr. Black presented a girl of sixteen years, whose right eye had been trephined on account of enlargement of the globe with increase of tension. Needling of congenital cataract had been done in each eye at the age of five years, but the right eye had never had much vision. A month ago she came with the right globe apparently increased in size, the sclera bluish, and the palpebral aperture increased. Tension with the Schiötz tonometer was then 60 mm. Hg. There was doubtful light perception in the eye, and the retina appeared to be detached above. At operation the trephine passed through the root of the iris into the vitreous, some of which had escaped. The tension of the eye, which had been much reduced for several weeks, was now almost normal again, but the eyeball was still congested and as prominent as ever.

Discussion.—Dr. Neeper considered the operation done with a sliding conjunctival flap to be easier than Elliott's method of dissecting back the conjunctiva at the corneal limbus, as the site for trephining could be seen more easily.

Dr. Coover said that there was danger of buttonholing the Elliott conjunctival flap.

Dr. Black suggested that the Elliott flap offered rather better support to the trephine opening than the sliding flap.

Dr. Coover had trephined in a case of staphyloma. The opening persisted for four weeks. The trephine had entered the vitreous, and whenever the tension increased vitreous escaped, but at the end of four weeks healing took place.

Dr. McKeown referred to a case of glaucoma with conical cornea upon which he had seen Dr. Fox operate, in which the corneal cone had flattened down after trephining.

Circinate Retinitis.

Dr. D. H. Coover presented a woman of sixty-two years, who on December 1st had come complaining of vision in the left eye becoming indistinct at times, and of difficulty in seeing

to sew or read. Vision was: Right, 5/60, not improved by lens; left, with correcting lens, = 6/10. The vessels of the right retina were contracted, the nervehead white, and there were atrophic changes in the macula, but no exudate was present in the eye. In the left eye, glistening whitish deposits surrounded the macula for a considerable area. In the macula itself the exudate was not quite so heavy. The exudate lay beneath the vessels, and there was a small hemorrhage on a vessel running down towards the macula. The general health was apparently good. Blood pressure, 135 mm. Hg. Wassermann test was negative, and there was no indication of kidney disease. There were cortical striæ in the lower nasal quadrant of each lens. The patient had been seen a year earlier by Dr. Libby, who reported that at that time he had observed a whitish tessellated exudate lying along the inferior temporal artery and vein beyond the macular region, which showed recent inflammatory disturbance

Discussion.—Dr. Jackson thought the condition in the left eye was retinitis circinata. In the right eye there was a condition of atrophy, and perhaps the exudate had disappeared largely in this eye, as in a case reported by de Schweinitz. Very probably both eyes represented different stages of the same condition.

Dr. Patterson referred to a patient who had a visual defect which he attributed to exposure to the snow. There were a few glistening areas in the macular region and nothing else. The color fields were variable. In such cases there is possibly an alteration in the vessel coats in the subretinal layers.

Dr. Libby, who thought the patient's general physical condition had deteriorated since he first saw her, did not believe that the condition in the first eye had been circinate retinitis, on account of the small and tessellated appearance of the exudate.

Punctate Cataract.

Dr. Melville Black presented a young man, aged nineteen years, both of whose lenses had been needled two years earlier on account of generally distributed white punctate opacities. At the posterior poles there had been granular disc-like opacities a little larger than the undilated pupil. Vision of the right, after needling and absorption, had been 20/30 with + 10. sph. Acute glaucoma, after needling of the left lens, had

rendered linear extraction necessary, and vision of 20/20 had been obtained with + 10. sph. and + .50 cyl. ax. 30°. Of late vision had been failing, and there was a granular looking membrane which he proposed to needle, although corrected vision was still better than 20/40 in each eye.

Syphilitic Mydriasis.

Dr. G. F. Libby presented a man of thirty-nine years, who had contracted syphilis at the age of nineteen years, and whose pupils had been permanently dilated, the left since the age of twenty-six years, and the right since the age of twenty-seven years. When the left pupil first became affected, there was complete ptosis of the left upper lid. The ptosis got better, and only a slight trace of it persisted to the present time. Corrected vision was now: Right 4/5, and left 4/6. Four years ago he was one of the first patients to get salvarsan from Klemperer in Berlin. The fundi were about normal, except for a slight atrophic change in the left disc. The pupils were fully dilated, and did not react at all to light, although eserin produced complete contraction. He required additional + 2. spheres for near.

Discussion.—Dr. Black recalled a case which resembled that of Dr. Libby. The patient had required the addition of + 1 spheres for reading.

Corneal Ulcer.

Dr. G. F. Libby presented a man whose left eye had been injured by a piece of coal a month ago, the result being a corneal ulcer involving a large central area. The patient had had infantile paralysis at the age of three years, and the left eye had been affected. There was now ptosis of the upper lid. There had been a great deal of lacrimation, but apparently very little corneal discharge, and hypopyon had appeared and disappeared several times. Electrocautery had been used, and the ulcer looked rather as though covered by epithelium, but two-thirds of it stained with fluorescein. The patient came from another oculist, and Dr. Libby proposed to use silver nitrate on the part which stained. There was a chronic dacryocystitis.

Discussion.—Dr. Black declared that he always found dacryocystitis in cases of extensive corneal ulcer, and advised syringing of the lacrimal passages.

Iridocyclitis.

Dr. D. H. Coover presented a girl of twelve years, whose right lens was cataractous, and whose left eye had for some years been sensitive to light. The blindness of the right eye had been first noticed at five years, but there was no history of pain or inflammation in this eye, although the pupil was adherent and the iris ballooned. Tension was normal and light perception good. The iris remained fixed under atropin. In the left eye the pupil was fixed and adherent, and next to the pupillary border there was a little membranous exudate. There was no pain, and no ciliary injection, although there was some ciliary tenderness. Left vision was 6/60, improving to 6/15 with — 1.25 sph., but with the lens before the eye the child complained of a good deal of pain. About fifteen months ago the child began to drag the right leg, and the muscles of the leg commenced to atrophy. Otherwise the general physical condition was good. Wassermann was negative, and no specific history could be gotten from the parents. Under mercurial and tonic treatment the leg had improved, but the eye was not helped.

Discussion.—Dr. Black referred to a case in which each eye was subject to recurrent iridocyclitis, but after iridectomy was done no further trouble was experienced. He would do iridectomy on this child's eyes, beginning with the right.

Dr. Jackson would try iridectomy, and then attempt extraction of the lens, in the right eye.

Subconjunctival Cyst After Cataract Extraction.

Dr. Coover presented a man in whose right eye cataract extraction had been done seven years previously, and who now came on account of a bulging above the cornea, which had begun some time after the operation and had gradually increased in size. The vision of the eye was still very satisfactory with correcting lens, and the tension of the eyeball was normal. The anterior chamber had good depth. The swelling had a flattened sausage shape, with its long axis transverse, its contents were clear and slightly straw colored, and its periphery was marked by a delicate vascularity.

Discussion.—Dr. Jackson thought it might be a cyst which had arisen from inclusion of conjunctival epithelium. The swelling would not keep its form if it had not a cyst wall. He

would remove in the same way as an ordinary conjunctival cyst, following with cauterization.

Dr. Aufmwasser suggested injecting fluorescein into the cyst to find out whether the aqueous became stained.

Penetrating Injury From Piece of Steel.

Dr. Chas. A. Walker presented a man whose left eye had been injured nine days previously while he was striking a hatchet with a hammer. Skiagraphy had shown a foreign body of the size of the point of a pencil, a little to the temporal side of the center of the vitreous. But repeated application of the giant magnet had produced no feeling at all in the eye, and no external signs. The lens was becoming more opaque, but the inflammation was less marked. Was it justifiable to go into the eye, and by what route?

Discussion.—Dr. Bane suggested testing with the sideroscope.

Drs. Black and Jackson favored trying the latter's scissors method, snipping in the vitreous with the scissors in contact with the hand magnet.

Dr. Coover favored using a magnetic spud.

William H. Crisp,
Secretary.

OPHTHALMIC SECTION

ST. LOUIS MEDICAL SOCIETY.

Meeting of November 6 1912.

Removal of Small Chip of Steel From the Vitreous.

Dr. W. E. Shahan: This case, which I wish to mention briefly, is of special interest because of the removal of a piece of steel from one eye through the original wound by means of a small hand magnet. He came to our office November 4th, with a history of being struck in the right eye by a small chip of steel which flew off from a hammer he was using, four days previously. There was a clean cut about 4 mm. long in the upper nasal quadrant of the cornea, and a corresponding cut, somewhat further nasally, in the anterior capsule of the lens. The lens was clouded over the whole of the nasal half. The sideroscope gave positive reactions to a magnetic foreign body. The pupil was only half dilated and the foreign body was not visible by means of the ophthalmoscope. The next day, under full mydriasis, the foreign body was plainly visible, even with oblique illumination, suspended by fine threads in the vitreous behind the lower nasal quadrant of the lens. It responded so promptly to magnetic influence that it was thought advisable to try to draw it around the lens through the zonule of Zinn into the anterior chamber, somewhat after the method of Haab. The giant magnet was used without success. The hand magnet, with one of the shorter, heavier points, was then used, the point being held at times directly against the sclera and cornea, as near the foreign body as possible. After some manipulation, the iris began to protrude at a point near where the foreign body was known to be. After some further manipulation, the point of the magnet being very near the original wound, but not touching it, there was a sudden gush of aqueous and the fragment of steel was found clinging to the point of the magnet. The eye has been perfectly quiet since.

Discussion.—Dr. Carl Barck: In this connection I would like to report a case which I saw about two weeks ago, and

then put a question before this society. The patient was a young man, about twenty years old. His right eye had been injured when he was a child, and in consequence a traumatic cataract had developed. This cataract was needled by a confrere about five years ago with a good result as to vision. The eye was perfectly quiet until a few days ago, when he struck it with a piece of wood. Since then increasing inflammation.

When he came to me I found in the anterior chamber, in front of the iris, a piece of capsule about 2 mm. in diameter. It was situated at the bottom of the chamber in the erect position of the patient, but easily movable. At one end of this piece of capsule and somewhat hidden by it, there was a small black spot or body. At first I took it for some iris pigment, but as it seemed rather large I placed the patient in front of the giant magnet. The magnet pulled it forward at once. This, of course, established the diagnosis that it was a piece of steel or iron. After a corneal section downward the piece was easily removed with the hand magnet. It was much more difficult to remove the piece of capsule with the forceps, because it had become fixed in the lowest portion of the chamber. The recovery was uneventful.

We have here a case where a piece of steel had been tolerated by the eye for about fourteen years without any irritative or other symptoms. In all probability the piece had entered the lens and remained there until the physician needled the cataract. Afterwards it was probably in such a situation, held or surrounded by a portion of the capsule, that irritation was prevented. The recent injury dislodged it and then inflammatory symptoms set in.

The question I want to bring up is, What is the best method of procedure in cases where the foreign body entered through the sclera without injury to the lens? Haab of Zurich recommends also in such instances to draw the piece with the giant magnet around the periphery of the lens and then through the pupil into the anterior chamber and remove it from there after a corneal section. This seems to me a dangerous procedure. It is of course possible to avoid injury to the lens during this maneuver, as it has been done. But it is not certain that such injury can be prevented; the slightest unruliness of the patient will produce it. I believe that it is preferable in such instances to remove the piece through the sclera with the

hand magnet; either through the old wound, when the case is seen early enough, or by a new scleral incision. The danger of introducing instruments into the vitreous has, in my opinion, been overestimated. My personal experiences with the small magnet have been quite satisfactory.

Dr. Shahan, in closing: It has been best, according to the experience of our office, to make an incision through the sclera and draw out a magnetic foreign body with the point of a small magnet, as Dr. Barck has described. But this case seemed to be very favorable for the other method, and it was therefore attempted with the above result.

Salvarsan in Interstitial Keratitis of Hereditary Syphilis.

Dr. John Green, Jr.: It is generally agreed among ophthalmologists that salvarsan has proved strikingly efficacious in many syphilitic ocular disorders, such as iritis, choroiditis, etc. Curiously enough, interstitial keratitis occurring in subjects of hereditary syphilis has seemed, as a rule, not to be favorably influenced. The writer has had occasion to investigate the literature bearing on this question, and it appears that present ophthalmic opinion tends to a belief in the greater efficiency in this affection of mercury and the iodids. From this point of view the following case is of interest:

K. V., age seven years, came to my service at the Children's Hospital, September 18, 1912. The mother stated that one month previously the right eye had become inflamed following a slight injury (finger thrust in eye). Two weeks later the left eye also became inflamed. He had been treated at a local eye clinic and the eyes had steadily grown worse. The boy presented a typical picture of a bilateral interstitial keratitis. Dr. T. C. Hempelmann, to whom the patient was referred for general examination, elicited the following additional facts: The patient was an only child; the mother had had no miscarriages. He was a full term infant and breast-fed for nine months. No diarrhea or constipation in infancy. Father died of tuberculosis. Patient has had pertussis, measles, but no scarlet fever or diphtheria. Has been somewhat nervous since eyes became sore. Physical examination showed the heart and lungs normal, the spleen palpable, the liver not enlarged. The boy exhibited well marked scaphoid scapulæ, epitrochlear glands on both sides enlarged, the axillary, cervical

and inguinal glands slightly enlarged. Wassermann strongly positive. The boy was first put on syrup ferri iodati, twenty drops three times a day, with some improvement. On October 11th .3 gram neosalvarsan was injected into the buttocks. There was prompt and striking improvement in the eyes so that by the 30th, when he returned for a second injection of a .25 gram, the photophobia had entirely disappeared and the corneæ had notably cleared.

Discussion.—Dr. Woodruff: The case I have to report is that of a girl eleven or twelve years of age, giving and having given for a number of years all the marked symptoms of interstitial keratitis and hereditary lues. The child has been under treatment for eight years, two years with one physician, five years with another, and a year ago last August she came to me. The child was given two injections of salvarsan. She had been troubled with a great deal of photobia, so much that she was unable to look at a book or to use a pair of scissors, etc. Had had repeated acute exacerbations of the trouble. Since about October a year ago she has been going to school steadily, not missing a day and has made a steady progess and has grown physically very markedly. I had a Wassermann done on Monday of this week and have the report that the condition is still positive. I shall have an injection of neosalvarsan given her at once. This case to me was exceedingly interesting because I knew the character of the treatment she had had before she had the salvarsan. Her general health has improved greatly and she has developed and grown, I should say, two inches in this last year.

Dr. Shahan: The case to which Dr. Woodruff refers came under our care some years ago. She was under our care for five years and had been given from one-twelfth to one-twenty-fourth of a grain of bichlorid of mercury three times a day continuously. She was given two doses of salvarsan, and I watched her through that period at the Skin and Cancer Hospital. The reaction was pretty severe. She had a great deal of pain, but almost immediate marked improvement in her symptom was noted. When I last saw her the photophobia had about ceased.

Dr. Shoemaker: I should like to ask the members of the Section whether any of you have gotten good results from the use of dionin in the late stages of parenchymatous keratitis,

when the inflammatory symptoms have subsided, but there still remains considerable opacity of the cornea.

Dr. Woodruff: In this case the cornea cleared very markedly, but I have been using, in addition to general treatment, a solution of dionin. Whether it was the salvarsan that did the work or the dionin, is somewhat of a question.

Dr. Loeb: I wish to take exception to the last remark. I have had a case of distinct improvement in a clinical case of a bilateral interstitial keratitis under the use of dionin. When the patient came to me the pupil was contracted as far as I could make out. The opacity was so dense that hardly any of the pupil or the iris could be seen. The acute process had entirely disappeared, very little injection remaining. I put the patient on internal treatment hydrarg. cum creta and locally atropin. After the pupil had been dilated sufficiently to get rid of any adhesions that were present, I put the patient on daily instillations of dionin. The cornea has cleared up; in one eye there is a slight opacity in the form of a minute scar, and the other eye has a few scattering opacities. It was the dionin, I feel convinced, that cleared the eye. I have seen numerous cases improve under the use of this drug.

The Relationship of the Posterior Lens Capsule and the Vitreous.

Dr. Carl Barck: The general view maintained by advocates of "extraction within the capsule," that a perfectly clear pupillary area is obtained, has not always proved true in the author's experience. In a number of instances a haziness or an opacity in the anterior layers of the vitreous was present. Similar observations have been reported by others. Investigations of the writings of such authorities as Morris, Piersol, Schwalbe, Salzmann, Greeff, Parsons and others, as to the presence or absence of a direct connection between the posterior capsule of the lens and the anterior layers of the vitreous, revealed widely varying and sometimes directly contradictory views. If there is a direct and intimate connection, laceration of the anterior layers of the vitreous may be expected from removal of the lens in its capsule; if there is no connection or a loose one, clear pupillary areas may be expected. In order to decide this question practically, the author cut away the cornea and iris and carefully covered the fibers of the zonule of Zinn from the eyes of oxen and rabbits, and found that when the eyes were

held so that the lenses were down, the lenses did not fall freely from the patellar fossæ of their own weight, but that considerable force was required to remove them. Also when the parts about the vitreous were cut away, and the vitreous held downward, the major part of the vitreous fell, but particles were always left adherent to the posterior surface of the lens. This, in the author's mind, at least in the case of these animals, proves that there is a distinct and fairly strong adhesion between the posterior lens capsule and the vitreous in the patellar fossa. Investigations of this same nature will be conducted later on human eyes.

Discussion.—Dr. Shahan: Considering the problem from an embryologic standpoint, it is also quite probable that there is some connection between the anterior portion of the vitreous and the posterior surface of the lens. It is well known that during one period of embryonic development, the hyaloid artery ramifies the vitreous and forms an intricate network on the posterior surface of the lens. And although this artery with its glial mantle, the central vitreous body of Retzius, disappears in late embryonic life, it is difficult to believe that it disappears so completely as to leave the lens and vitreous completely separated by perfectly clean surfaces. It is much more probable that there are fibrillar remains of these early structures extending from the posterior lens capsule into the vitreous, so that when the lens is removed in its capsule these fibrils are uprooted with consequent laceration and occasional clouding of the anterior surface of the vitreous. It is not at all unusual to see remains of the hyaloid artery on the posterior surface of adult lenses during routine ophthalmoscopic examinations.

Dr. J. Gross: I am not sure, but it may be of interest to you to know that Dr. Ewing has been devising forceps for cutting and removing the anterior lens capsule in the extraction of cataract. I think he has published some of these results in the *American Journal of Ophthalmology*. I have seen Dr. Ewing operate with these forceps in two or three cases, and the results were very satisfactory. I suppose if you could pull out the entire lens capsule with any kind of a forceps without cutting it up, it would be better still, but I have my doubts as to the possibility of that.

Dr. Shahan: With regard to the use of capsule forceps, I

had the opportunity of seeing them frequently used in various parts of Europe and England. They appear to be quite universally used as a routine on the continent, but in London apparently not so freely. I was struck by the fact, which may have been accidental, of seeing more needle operations in a few days in London than I saw in several months on the continent.

Dr. Barck, in closing: I believe that if we would find a reliable method to remove the entire capsule and lens, this method would be preferable to the extraction of the lens in the capsule, because less dangerous and because the vitreous is left intact.

As to the embryologic question, brought up by Dr. Shahan, we know of course that the vitreous develops from the mesoderm and the lens from the ectoderm. But this has, in my opinion, little bearing on the practical side of the question. For in spite of development from different embryologic layers, the two membranes may become afterwards so intimately united as to become practically one. This happens in other parts of the human body.

WALDEMAR FISCHER,
Section Editor.

PHILADELPHIA POLYCLINIC OPHTHALMIC SOCIETY.

Meeting of October 10, 1912. Dr. Wendell Reber in the chair.

Proptosis Probably Due to Maxillary Sarcoma.

Dr. William Campbell Posey exhibited a young man with marked proptosis of the right eye, probably in consequence of an orbital tumor. The eye was advanced 20 mm. more than its fellow, and showed all the signs of great stasis in the orbital circulation. An incision into the orbit some months previously, with excision of some of the tissue for diagnostic purposes, gave evidence of the simple inflammatory nature of the orbital cellulitis, and it was thought to have proceeded from a periostitis. Its persistence, however, despite constitutional remedies, now led him to fear a neoplasm. X-ray and rhinologic studies would follow. Dr. Posey spoke of the value of the Krönlein procedure for the removal of growths from the apex of the orbit and said that in the cases in which he had made use of this method there had been practically no scarring.

Discussion.—Dr. Wm. Zentmayer: In regard to the diagnosis, there was complete fixity of the globe with a palpable mass above and below. It is six months since we first saw him and it has scarcely increased; the vision also remains the same. I doubt very much if the Krönlein operation would remove the growth. The degree of exophthalmus has no relation to the size of the growth. I think the one point in favor of involvement of the optic nerve is the man's age. There is no more difficult diagnosis in ophthalmology.

Dr. Reber: If a small growth is situated inside the muscular cone, that of itself will produce a great deal of edema and produce an exophthalmus out of all proportion to the size of the growth. I think this is an inflammatory growth and would say that a Krönlein operation is justified.

Dr. Posey: My own view is that there is a growth inside the maxillary bone, and my intention is to make a Krönlein if there is. I never get ready for any operation of this kind without having everything ready for a Krönlein opera-

tion. In all probability there is a sarcomatous growth which involves the maxillary bone, giving rise to marked inflammation of all the surroundings of the bone.

Dr. Luther Peter spoke of a man sixty-two years old, who about four years ago had a tonsillar growth removed. Later there was a recurrence. Shortly after this he began to have, just as we have here, complete palsy of all the eye muscles. The X-ray showed that there was an inflammatory growth in the orbit evidently secondary to the tonsillar condition.

Paralysis of Associated Movements to the Left.

Dr. Posey gave the notes of an associated conjugate paralysis of the movements of both eyes to the left, which he had found in a one year old child. The condition had followed a slight fall, but was thought by Dr. Posey and Dr. McCoombs of the Children's Hospital staff, who had seen the case with him, to be independent of this, and a manifestation of infantile palsy. There were no other ocular or general symptoms.

Discussion.—Dr. McCoombs spoke of a similar case they had had at the Children's Hospital about two years before. The child was brought to the hospital with fever and diarrhea, and the same afternoon the right eye began to twitch and the face was drawn very strongly to the left. Next morning the child had developed acute anterior poliomyelitis. The child was five months old. Palsy of the right seventh nerve remained. Dr. Posey's case seemed to be the same thing as this other case, the ptosis and palsy were on the same side. It was suggested it might be acute third nerve anterior poliomyelitis.

Dr. Peter: Associated palsy in infants is very rare. In eleven months of neurologic practice I never saw it. There must be some reason in the cortex for the condition. It may be that the fall brought about some cortical change.

Dr. Reber: Dr. Peter's hypothesis is a possibility in Dr. Posey's case. We are teaching that the associated movements are represented more in the cortex. It seems to me there is a great deal of clinical evidence of the existence of cortical areas for associated movements.

Dr. Zentmayer: In a case reported by Snell, first upward movement of one eye was affected; later there was palsy of associated movement upward.

Buphthalmos.

Dr. Wm. Zentmayer: This specimen was removed from the eye of a colored child in the spring. Proptosis was extreme. The diameter of the cornea was 18 mm., the anterior chamber very deep. The other eye showed no involvement. He also referred to the case of another little girl who had buphthalmos of both eyes. A great deal of vitreous was lost in the operation done for relief of the disease.

The condition of uniform distension of the eyeball is one that is seen almost entirely in infants. In this case the child was three years of age, but the buphthalmos had been noticed only three months before.

In such eyes the distension is uniform. The cornea becomes large and increases in diameter. The lens is often dislocated. There are some few cases in which the process has been arrested, but they usually go blind. Surgical interference is almost always unsatisfactory. Once you open the eye the vitreous comes forward and often escapes. Iridectomy has not been a very satisfactory operation. I might say I have seen five cases, and two out of the five have been colored children.

Discussion.—Dr. Posey: I think there can be no doubt that the etiology is a uterine one. The anterior chamber is so blocked that the eye in its growth is stretched. I think I have seen cases of buphthalmos in advanced child life, that is to say, five to ten years of age, but I never saw one in adult life. I believe they all lose their sight. The next case I get I think I shall do a posterior sclerectomy first and then do an iridectomy later. In many of these cases the iris is very hard to get out. Even if you get out the tip (or pupillary edge) it will do no good; you must get out the rest of the iris back in the angle of the anterior chamber. I never remember having had a case of successful iridectomy in buphthalmos. I think, however, that miotics offer a good chance for help.

Dr. Reber: I have seen three cases of buphthalmos, and two of them had very large cornea, 13 to 14 mm. in diameter. In the case of a boy, whom I have not seen for three years, there was then vision of 5/60. The family would not consent to operation. Another case was a bilateral one of a child of about two years old. In that case there was a slight coloboma of the iris. The third case was in a little girl of about

two years old and was a unilateral one. In view of all the difficulties of iridectomy in these cases I feel that on the next one that comes under my observation I shall do Elliott's operation of trephining.

Dr. Harbridge asked if it had been observed if this condition presented itself at any particular period or does it generally begin at the time of birth?

Glaucoma; Trephining.

Dr. Reber presented three cases illustrating the results following Elliott's trephining operation in two cases of glaucoma. One was in a young man of 27, who four years previously had had a violent blow upon the eye with consequent blindness. For four years the eye had been sightless, but quiet. There was acute inflammatory glaucoma of two weeks' duration, nonyielding to drug treatment. Trephining was done under local anesthesia with complete relief of all the symptoms.

Another case was a 65 year old man with typical acute inflammatory glaucoma of two weeks' standing that had not yielded to the most comprehensive drug treatment. Vision equaled counting fingers at three feet. Trephining was done under local anesthesia, and twelve days after operation the vision had risen to 5/20, and the eye was perfectly quiet. In the other case chronic noninflammatory glaucoma had existed for years. The eye was absolutely blind and had been for years intermittently painful and miotics had lost their effect. Trephining was done under local anesthesia and the result as to pain has been perfect. Dr. Reber feels that the operation of trephining has much to recommend it and is impressed with the complete reduction of tension it effects, also the freedom from gross hemorrhage after the operation, the unaltered or slightly altered pupil and the simplicity of performance.

Meeting of November 11, 1912. Dr. Wendell Reber in the Chair.

Treatment of Disorders of the Lacrimal Apparatus.

Dr. W. W. Watson: Varied disorders of the lacrimal apparatus extend from a simple inflammation of the lacrimal gland which is rare (a dacryoadenitis) to suppurating disturbances

of the sac and nasolacrimal tubes of a profound type. The treatment must, therefore, be of such a character as to meet these various requirements to combat the progress of the disease successfully.

Obstructions of the nasolacrimal duct are usually situated at the commencement of the canal or at its opening into the nose. A method of ascertaining if there is a stenosis of the nasolacrimal passage is to introduce into the canaliculus the needle of an Anel's syringe as far as the sac and with it inject a small quantity of salt solution stained with fluorescin. If the canal is patulous, the colored fluid will present at the nose. Absolute proof, however, is the passage of a probe and slitting of the canaliculus. Treatment by sounds must be kept up with a gradual increase in their size until a Bowman's No. 4 at least passes with ease. The probe should be introduced every few days if the patient can come for treatment that often, but if not, the wearing of a style is advocated for a short time. If there is continual recurring tumefaction in the nose, resection of the inferior turbinate is indicated.

Treatment of chronic dacryocystitis is directed to the underlying nasal cause and the extirpation of the sac. Preservation of the sac is usually impossible if bony strictures are present, and early removal should always be considered in the laboring classes, who have little time to spare. In acute dacryocystitis developing rapidly into an abscess, treatment should be directed toward prevention of abscess formation. Restore the lumen of the duct by sounds and if possible induce the fistula to close, if the cutaneous wall has had to be incised for abscess.

Discussion.— Dr. Posey: My own practice differs somewhat from that mentioned by Dr. Watson. In acute dacryocystitis it is my practice to place the patient under ether and to evacuate the pus from the sac by slitting up the lower canaliculus. The stricture in the duct is then overcome by probing and a style introduced to keep the duct patulous. Healing is prompt, and this method has the advantage of not only relieving the acute condition but also of correcting the cause at the same time. It is essential that the short end of the style should rest securely in the groove of the incised lower canaliculus, for cosmetic reasons and to prevent the incision from healing. The style may be left in situ for months. Never syringe after probing on account of the danger of some of the fluid getting into the soft

tissues of the orbit through a rent in the mucous membrane. He deprecated the use of silver nitrate or other strong caustics in syringing, and said that he had once seen optic atrophy arise (in the case of a colleague) from orbital cellulitis excited by syringing with a 1 per cent solution of silver nitrate, the solution gaining access to the tissues of the orbit in consequence of a false passage made with the tip of the syringe. In all cases where the mucous membrane of the sac was secreting pus and in all cases of mucocele he advised the immediate removal of the sac. He had never removed a portion of the lacrimal gland, and cited a case occurring in the practice of a colleague in which serious corneal complications arose following the excision of the palpebral portion of the gland. He cautioned against the employment of Weber's canaliculus knives with curved tips. In many cases of stillicidium the stricture is in the canaliculus, near its entrance to the sac, and unless a straight probe pointed knife be used, the surgeon will not succeed in entering the sac in such cases but will merely slit up the canaliculus.

Dr. Harbridge: Following a discussion of this subject last season before this society, I selected three patients with lacrimal trouble in which there was present a profuse pus discharge. Each was thoroughly cleaned and a probe passed once. Subsequent treatment consisted of washing with a boracic acid solution followed by a very weak iodin solution (and a few drops of Lugol's solution). The pus disappeared and in its place there has persisted a moderate mucous discharge. One in which the washing was withheld for a time promptly returned to a pus discharge. It is likely that removal of the sac will be the only means which will afford entire relief.

Dr. Kistler: I would like to say something in regard to the lead style. Dr. Posey remarked that he leaves the style in for six months without taking it out; also that it needs no cleaning. I have been troubled with concretions forming at the root of the style. If I had not removed them at that time they would have been completely eaten off. I have had this experience two or three times. In one case particularly the wire was almost entirely eaten off. In the two other cases the wire was covered with a corrosion that was hard to remove.

Dr. Peter: I have had similar experiences of the kind Dr. Kistler just spoke of. I find that leaden styles will have a certain amount of corrosion on them. For that reason I have

been in the habit of removing these styles once in three weeks and I find I have to put in new styles.

Dr. Posey said there was always some corrosion at the nasal end of the styles, but that he had never seen it give rise to any trouble. The styles should not be made of pure lead, but of an amalgam of lead and zinc. He had removed styles which had remained in situ two years or more without giving rise to irritation. He had once removed a piece of gold wire from a man's nose, which had been inserted into the duct twenty-eight years previously.

Dr. Reber: Some years ago Dr. Sweet removed with great difficulty a style that had been in the duct for seven or eight years. Personally I don't see why the styles should not be removed oftener, but it seems to me it would be preferable to have the sac removed. In the matter of acute dacryocystitis I support Dr. Posey. I saw a young man yesterday, twenty years of age, who had been sadly overtreated. He is wearing a very poor correction which may have something to do with the existing condition. The anterior end of the inferior turbinate of the affected side was edematous and obstructing the valve-like opening at the lower end of the lacrimal duct. Removal of the anterior end of the inferior turbinate body entirely relieved the epiphora. I agree with Dr. Posey, that where there is mucocele or dacryocystitis extirpation is the best procedure.

Senile Cataract Extraction Followed by Certain Complications.

Dr. D. Forest Harbridge, referring to the operation for the extraction of senile cataract in the very old, spoke of the subsequent disaster which frequently occurred during convalescence or later, influencing primarily the utility of the eye and very likely secondarily the life of the patient. The secondary effect is to be qualified by the expression "very likely," for the reason it is difficult for a physician to estimate accurately the resistive and recuperative powers of the old and infirm patient. The greatest proportion of senile cataract patients coming to operation are between the ages of sixty and seventy-five years. A very small minority of operations occurring above the age of eighty years.

The writer recalled eight operations upon patients eighty years or above which strongly impressed him by the severity

of the operation upon the individual's subsequent life history. In certain instances the extreme shock lasting for months finally terminating in death.

Two patients dying within a year, from cerebral hemorrhage. One patient (diabetic) dying within three days, from an uncontrolled vomiting. Two (same patient) one eye lost, result of injury while delirious, really useful vision of remaining eye persisted for three years. One extremely nervous patient squeezed lids at time of first dressing, causing wound to open, necessitating further attention. Patient remained profoundly prostrated for some two years. One, mildly delirious, removed her bandage three times the first day; allowed to sit up the following day; returned home on the ninth day with a perfect result. One complicated by premature extrusion of the lens, followed by fluid vitreous. Twelve hours later the patient developed acute mania. Wound healed kindly. At the present writing (one month) the patient remains so profoundly shocked that life is in imminent danger.

In all there was present mental disorder, from a mild delirium to acute mania, and in only one can the result be considered entirely satisfactory.

Dr. Harbridge does not take the above as contraindicating the operation under certain circumstances, but he does feel that "very likely" the shock lessens the length of life in many patients. It should, therefore, be taken as a warning not to be too aggressive, for if these old patients can get about with a fair degree of comfort it is better not to interfere.

Discussion.—Dr. Posey: Dr. Harbridge has done well to point out that the operation for cataract is a great shock to the patient. At least 10 per cent of those operated on suffer temporary mental aberration. It was held by some that the delirium was due to the atropin which was dropped in the eye subsequent to the operation, but we know that that is not true, because delirium has been observed when atropin was not used. Schmidt-Rimpler thought that it was due to the exclusion of mental impressions in consequence of the bandaging of both eyes. But the delirium has occurred when no bandaging was done. A French observer, Martin, thought it was due to autointoxication, probably from a retention of urine, but this may be disproved by our own experience at Wills Hospital, where it is the rule to clean out the bowels before the operation, to

keep the diet low for twenty-four to twenty-eight hours and to catheterize the patient if the urine is not voided. Dr. Kipp claimed that homesickness was the cause of the delirium, but we have seen these patients delirious when operated upon in their own homes. In my opinion, the delirium is due to the excessive preoccupation of the patient both before and after operation, and to various senile vascular changes in the brain. In most cases the delirium passed away in ten days to two weeks, but in those predisposed to insanity, chronic mania may ensue. Dr. Posey said that the operation for the removal of cataract should be undertaken in very old subjects only when vision was so low that it no longer permitted the sufferer to get about. In a few cases, death ensued shortly after the operation, from pneumonia or apoplexy, and he was convinced from his own experience that the shock of the operation frequently hastened death. Many of his aged patients who had been successfully operated upon died within a year of the operation.

Dr. Reber: What Dr. Posey has said just about covers all there is to this matter. The whole subject is an intensely interesting one to me. I feel exactly as Dr. Posey does, and I do not often advise people over eighty years of age to have an operation. There is almost always so much psychic excitement that I advise a preliminary iridectomy in younger people. In one of my cases pneumonia developed fulminantly, in a very fat man, sixty-one years of age. He was perfectly well the evening of the fourth day, and died in about an hour. I believe we should not promise the patient or the family too much. My usual statement is that if the patient can get about by himself, it is all that can be reasonably expected.

Dr. Zentmayer reported that he had had a patient die after a cataract operation. He had been up and about, but was found dead in bed. He was very feeble. His mentality was not of the best, but no apparent cause was found for his death.

Dr. Harbridge, closing: Regarding the question of a preliminary iridectomy, I rather favor this method as possessing certain advantages, in that it affords in a measure an opportunity to know how both the patient and his tissues will withstand such interference.

D. Forest Harbridge,
Secretary.

WILLS HOSPITAL OPHTHALMIC SOCIETY.

Meeting of October 8, 1912. Dr. William Zentmayer, Chairman.

Dislocation of the Lens.

Dr. S. D. Risley presented two patients with partial dislocation of the lens. The first in a child five years of age in whom the only symptom was a vertically dilated, ovid or egg-shaped pupil, the expansion being downward. The lower part of the iris was fixed, while the upper part still responded to light. While studying the eye with an electric ophthalmoscope the head was tilted strongly backward, when the pupil suddenly resumed its normal shape and position, but remained slightly dilated. After a week the slight dilatation remained with an occasional tendency to resume the ovoid form.

The second case was a man forty years old, who had received a blow with the handle of a heavy tool on the nasal aspect of the right supraorbital ridge. The right eye had evidently been struck through the closed lid. There was pain, deep injection of the globe and a dilated pupil. The lens was transparent, but its nasal border could be seen by daylight, the entire body of the lens having been forced toward the temporal side. A crescent could readily be seen between its nasal margin and the rim of the dilated pupil. The vitreous was filled with floating debris. The iris was not tremulous. Under treatment and rest, in ten days the dislocated lens could no longer be demonstrated, but the vitreous was too cloudy to permit any study of the fundus and vision was reduced to counting fingers doubtfully.

Dr. Risley suggested that the outward dislocation of the lens and the condition of the vitreous might be due to a detachment of the tissues from the sclera in the ciliary region, at the point where the blow must have been received. Under these conditions there would be a filling up of the suprachoroidal space, the subsequent absorption of which would account for the replacement of the lens. It was not probable that there had been any extensive rupture of the suspensory ligament.

Discussion.—Dr. Posey spoke of the seriousness attending

any form of dislocation of the lens. Vision is almost always greatly interfered with and in most cases the future integrity of the eye is endangered. He enumerated some of the sequelæ of dislocation of the lens, and dwelt upon the difficulty attending the removal of the lens when once it had broken away from its attachment to the ciliary body.

A Case of Unusual Choroidal Atrophy.

Dr. Burton Chance presented a case showing two large perfectly circular areas of choroidal atrophy, on a line with the optic disc and embraced within the span of the large temporal vessels. The areas were clear-cut discs with pigmented borders; they were too large to be compared to macular "holes," neither had they the attributes of colobomata. The rest of the fundus was healthy. It is probable that the condition was the result of antenatal disease.

Intraocular Neoplasm.

Dr. William Campbell Posey exhibited a specimen of intraocular tumor which had perforated the globe below and had invaded the tissues of the orbit in a woman seventy-two years of age. Traumatism was denied, the only history obtainable being one of progressive blindness without pain or inflammatory symptoms until of recent date, when the spontaneous rupture of the globe and the formation of a cystoid cicatrix at the lower and outer corneal limbus occasioned some discomfort and irritation. The extraocular portion of the neoplasm, which had been removed from the eye some months before, was of a mushroom shape and was apparently connected with the sclera by a broad round attachment. The mass was hard and smooth and limited by a dense capsule.

Dr. Posey spoke at some length of the usual course of intraocular tumors and of the necessity of early enucleation to preserve life, once the diagnosis is made. He referred to a case he had seen on the last clinic day, of probable intraocular sarcoma, though a fully developed cataract prevented a view of the fundus. He spoke of the aid afforded by transillumination in making the diagnosis.

Meeting of November 4, 1912. Dr. S. Lewis Ziegler, Chairman.

Bilateral Buphthalmos.

Dr. William Zentmayer exhibited a case of bilateral buphthalmos. The patient was a colored boy, eleven years of age. Both eyes showed the characteristic changes of this affection. The interesting feature of the case was the absence of increased tension; in one eye it was slightly minus. Notwithstanding this the distension was extreme, and deep glaucomatous excavations were discernible in the papillæ through the cloudy corneæ. Dr. Zentmayer commented upon the coincidence that this was the third case of buphthalmos in his service within six months, all in negro children. He thought that the frequency of its occurrence in this race was to be explained by the greater prevalence of syphilis among the negroes, the pathogenesis of the condition being an intrauterine specific inflammation which interfered with the proper development of the eye.

Dr. Risley recalled having seen three cases of buphthalmos, two of which were in colored children, the third a white girl born of syphilitic parentage. There was in this case, at the time of birth, entire seclusion of the pupil from prenatal iritis. After birth the eye rapidly developed increased tension and buphthalmos. The eyeball was removed and measured 37 mm. in its anteroposterior diameter.

In one of the colored children Dr. Risley had performed a broad iridectomy upward on both eyes, which relieved the pain. About ten years later he heard through an aunt that the child had maintained sufficient vision to work in the garden, seeing enough to pick peas and to remove the bugs from potato vines. It would seem, therefore, that this child had been benefited to the extent of saving such vision as she had at the time of the operation.

Dr. Posey said that he was unable to recall whether the few cases of buphthalmos he had seen occurred in white or colored subjects. He had never, however, seen a case of buphthalmos in his private practice. He thought the haze and stretching of the limbal tissues, as demonstrated so clearly in one of Dr. Zentmayer's cases, indicated the probable origin of the affection, i. e., in an inflammation of the mesoblastic tissue of the eye during intrauterine life. The frequent oc-

currence in negroes suggested the nature of this affection to be probably luetic. Iridectomy was most unsatisfactory in buphthalmos, owing to the extensive and firm adhesions which glued the iris to the cornea. He thought cases of idiopathic buphthalmos extremely rare, and cautioned against mistaking instances of pseudobuphthalmos (i. e., cases in which the globe was stretched in consequence of some disease originating in the eye after birth) for the stretching of the globe from causes operating during intrauterine life.

Dr. Crampton inquired if cases going on to rupture had occurred in the experience of the author, and mentioned having seen cases of this sort in the service of the late Dr. George C. Harlan at the Pennsylvania School for the Blind. The sclera and cornea gradually became so distended and attenuated that rupture ensued. This accident was prevented generally in extreme cases by timely enucleation.

Tubercle of the Choroid.

Dr. William Campbell Posey showed a case of tubercle of the choroid in a woman twenty-one years of age. The tubercle had first appeared some two months previously, taking the form of an intense uveitis. The tuberculous nature of the affection had been suspected by a positive von Pirquet test, and was later confirmed by subcutaneous injections of old tuberculin, the reaction being obtained by a dosage of 1/25 milligram. Dr. Posey warned against the use of strong solutions of tuberculin for diagnostic purposes, and said his initial dose was invariably 1/500 mg. Under the continuous use of tuberculin vision was improved, the vitreous clearing, a large tubercle now being visible at the equator of the globe to the temporal side. The hypodermic use of tuberculin will be persisted in throughout the winter, and Dr. Posey was of the opinion that the patient will ultimately obtain satisfactory vision in the affected eye.

Detachment of the Retina.

Dr. Burton Chance presented a case of detachment of the retina of obscure origin. The patient was a lady past fifty, who had been in good health, except for a troublesome cough, with which she was sometimes seized in violent paroxysms. She came to the hospital first in December, 1911, because of

presbyopic symptoms. The fundi at that time were healthy and her sight was good, being 6/9. She came again last week, with the statement that her sight had remained good until the middle of August, when that of the left eye became blurred, yet as the degree of the obscurity varied, she had paid but little attention to it. When examined four days ago, a large and bulging detachment of the retina was seen, involving the upper temporal quadrant and projecting well across the axis, hindering all view of the disc. There was a flat separation in the lower field. The retina was so dark, so smooth, and the vessel's course so straight that Dr. Chance first thought a solid mass had caused the separation. The tension was not increased, however, although the mass was apparently immobile. The eye was not myopic; there had been no injury; nothing suggested itself as a cause, except the violent attacks of coughing. The mass seemed to throw no shadow in transillumination; it was too far back to receive the full force of the lamp.

It was difficult to arrive at a clear understanding as to the cause of so great a detachment. The age of the patient, the absence of any history of injury or disease, and the refraction of the eye suggested the possibility of a solid substance being the cause. As a tentative measure potassium iodid was prescribed, and the patient was advised to restrict her motions.

Today, to the surprise of all, the mass has become so much reduced that the disc can be seen. The separation at the floor has increased, however, so it is probable that gravity has caused a transfer of the fluid to the lower portions of the globe.

Dr. Posey said that by reason of the localization of the detachment in the upper temporal portion of the retina, on account of the absence of myopia and history of traumatism, and from the age of the patient, the possibility of the detachment being due to sarcoma of the choroid should be taken into careful consideration. While the transillumination test was negative, the presence of a growth should not be excluded from this alone, for if the growth was at all posterior, transillumination of the globe would naturally show nothing.

Dr. Zentmayer did not think that the detachment was secondary to a new growth, because of its sudden onset without previous disturbance of vision; because the previous recent

examination of the eye revealed it to be healthy; that transillumination was negative, which was, however, only negatively important, and because there was a history of repeated severe attacks of coughing. He was opposed to enucleation.

Neutral Soap in Operative Technic.

Dr. S. Lewis Ziegler exhibited a neutral liquid soap, especially adapted for use in ophthalmic surgery. It contained but 10 per cent of alcohol, 10 per cent of glycerin, and is made from cotton seed oil, which is a light, bland oil. The soap is a very thorough cleanser, has the advantage of not producing a lather, and because of its lack of alkalinity it is not irritating to the skin and can be used without danger in the conjunctival sac.

Dr. Zentmayer asked Dr. Ziegler whether he had had cultures made from hands which had been washed with neutral soap.

Orbital Disease.

Dr. Posey showed two cases of orbital disease in young men. In the first of these he had performed a Krönlein operation for diagnostic purposes, and finding the orbit to be filled with a hard growth, apparently sarcomatous in nature, he had removed the eye and eviscerated the contents of the orbit. Microscopic examination of the growth has not as yet been made. This case was of interest because when first seen a diagnosis of orbital cellulitis from periostitis had been made, and a microscopic examination of a strip of excised tissue giving evidence of a diffuse cellulitis.

In the second case there was marked proptosis with signs of acute orbital cellulitis, in a young man who had some months previously undergone a Killian operation for suppurative frontal sinusitis, the recurrence of the orbital cellulitis being due to a recent infection of the ethmoidal and sphenoidal cells. The acute symptoms were subsiding under local and general treatment, but Dr. Posey said that he proposed to open the orbit later for the purpose of removing a layer of dead bone which the X-ray showed to be present in the roof of the orbit.

J. Milton Griscom,
Secretary.

BOOK REVIEWS.

Pathology of the Eye.

By P. H. Adams, M. A., M. B., D. O. Oxon, F. R. C. S., Surgeon to Oxford Eye Hospital; Consulting Ophthalmic Surgeon to the Radcliffe Infirmary, London. Henry Frowde, Oxford University Press. Hodder & Koughton, Warwick Square, E. C.

This is a splendid compend for one doing his own pathologic eye work. The various tissues of the eye are taken up separately, giving first the histologic appearance, and then the pathologic changes which may take place. One staining method is generally given in detail. The first chapter deals with methods of imbedding and staining. It is a very handy volume to have in a laboratory. M. W.

A Pocket Atlas and Text Book of the Fundus Oculi With Note and Drawing Book.

Text by G. Lindsay Johnson, M. A., M. D., F. R. C. S., etc., with drawings from life by Arthur W. Head, F. Z. S., America. F. A. Hardy & Company, 10 S. Wabash Ave., Chicago, Ill.

This handy and convenient little book is something that fills a void in our ophthalmic publications. The illustrations by Mr. Head, fifty-eight in number, are excellent and consist of only usual conditions. The little Note and Drawing Book, with colored pencil attached, containing valuable hints as to making sketches, supplies a deficiency which many of us have long felt. M. W.

Outline of Applied Optics.

By P. G. Nutting, Associate Physicist, Bureau of Standards, Washington, D. C. Seventy-three illustrations. P. Blakiston's Son & Co., 1012 Walnut St., Philadelphia, Pa., 1912.

For the worker in applied optics, medical or otherwise, this work will be of considerable help. It presupposes a general

knowledge of higher mathematics and elementary principles of optics. Of especial interest to the ophthalmologist should be Optical Instruments, the chapters on Refractometry, the Eye and Vision, Colorimetry, and Illuminations. M. W.

Manual of the Diseases of the Eye for Students and General Practitioners.

By Charles H. May, M. D. Seventh edition, revised, with 362 illustrations, including 22 plates with 62 colored figures. Wm. Wood & Co., New York, 1911. $2.00 net.

The seventh edition of this book has several added chapters, including Ocular Manifestations of General Diseases, and has been made up to date generally. It is too well known to require further comment. M. W.

Practical Exercises in Physiologic Optics.

By George J. Burch, M. A., D. S. C. Oxon, F. R. C. S.

This is a splendid exposition of various methods of practically demonstrating the salient points in physiologic optics, without requiring too deep a knowledge of mathematics. For one not having the opportunity of taking a course on optics, a few moments each day could be profitably spent by following the experiments so clearly outlined in this book.

M. W.

Handbook of Treatment for Diseases of the Eye.

By Dr. Curt Adams, Assistant Surgeon in the I Univ. Clinic for Diseases of the Eye, Berlin, with a preface by Prof. von Michel, Berlin. Translated from the second German Edition (1910) by William George Lynn, M. F., F. R. C. S., Ed., and E. M. Lithgow, M. B., F. R. C. S., Ed. Thirty-six illustrations. Rebman Company, 1123 Broadway.

This small work, as stated by the author in the preface to the first edition, is principally to supply an outline of treatment of eye conditions for the man in general practice. It is of little value to the specialist, except to those who are beginning, to whom it gives a variety of prescriptions and a dis-

cussion as to the relative value of certain methods of treatment. M. W.

Anatomie und Histologie des Menschlichen Augapfels in Normalzustande, Seine Entwicklung und Sein Altern.

(Anatomy and Histology of the Normal Human Eye, etc., Development and Growth.) von Dr. Maximilian Salzmann, Professor der Augenheilkunde in Wein. Five figures in text and nine tables engraved. Franz Deuticke, Lepzig and Wein, 1912.

This work is compiled from a series of lectures delivered by Prof. Salzmann, and has been published at the request of his many former students. He has dealt but slightly with comparative anatomy, trying to present a fairly thorough knowledge of the anatomy of the eye from an ophthalmologist's standpoint rather than that of an anatomist. The illustrations are made wholly from original preparations, only a few being schematic. The name of the author insures a treatise worth while. M. W.

An Additional Contribution to the Glaucoma Problem.

By Dr. W. Wagner, Odessa, Berlin. Published by S. Karger, Berlin, 1912. Price, 1 mark, 50 pfennig.

This work is a supplement to the author's previous publications, which deal especially with his own eye. He claims that an early iridectomy will cure almost any form of glaucoma. The different varieties of glaucoma are caused by differences in the relation between intraocular and general blood and lymph pressure and the elasticity of the corneoscleral capsule and intracapsular tissue. These differences are of mechanical origin, and the lesions found in the eye are rather the result than the cause. He believes that it is an increase of the inflow of the fluids into the eye, rather than an impediment to the outflow, which causes the trouble, the latter condition being secondary to the former. C. L.

The Anatomy and Histology of the Human Eyeball in the Normal State. Its Development and Senescence.

By Dr. Maximilian Salzmann, Titular Professor of Ophthalmology, University of Vienna. Translated by F. V. L.

Brown, M. D., Instructor in the Pathology of the Eye, University of Chicago. Chicago Medical Book Co., 1912. Price, $5.00.

The translation is a book of 232 pages with five text figures and nine plates in photocollotype. The latter are exceptionally good reproductions. The text is divided into two parts, the first dealing with the adult eyeball and the second with the physiologic changes that take place during development and senescence. It will prove a very valuable reference book in connection with the minute structure of the eye. C. L.

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VIII.

THE DEFICIENT RESULTS IN THE EXPERIMENTAL FINDINGS REGARDING THE FLUID CURRENT OF THE EYE.

J. Kuschel, M. D.,

Luedenscheid, Germany.

Translated by T. T. Blaise, M. D.,

Mason City, Iowa.

The discussion of the eighty-second meeting of German Naturalists and Physicians in Königsberg "On the Fluid Currents of the Eye" resulted in a conclusion which approaches suspiciously close to a declaration of bankruptcy in the experimental method of research.

O. Weiss, from the viewpoint of physiology, drew the following conclusions: "A summing up of the views gives us the following: 1. It has not been possible to show directly that the aqueous humor is in a state of current movements. 2. No proof is at hand that there is a flow of fluid into the normal eye. 3. Equally little proof is at hand that there is an exit current."

Th. J. Bürgers, who reported on the bacteriologic and serologic result of the investigations, is, however, obliged to

acknowledge a current change, but considers the same as exceedingly small. "Giving the matter a final and brief reconsideration of the behavior of the individual materials in regard to their quantitative relation to the serum, we conclude: Of the bactericidal complement contained in the blood serum, scarcely one-twentieth passes into the normal aqueous fluid; of the opsonic and hemolytic complement, none at all passes into the aqueous, while only one-five-hundredth to one-thousandth part of the antitoxins, agglutinins and amboceptors contained in the blood serum pass into the aqueous. So far no precipitins have been discovered, the reasons for which are given above. As to the vitreous, the conditions have not been sufficiently investigated, although it has so far been established that the flow into the vitreous occurs in a still smaller and slower degree. We have thus a certain elective condition of the secretory apparatus of the eye, although not according to the idea of Römer. Apart from the lack of pressure variance, a filtration cannot be acknowledged. For the same reason I must deny the existence of a diffusion, against which also argues the observed fact that antibodies diffuse scarcely at all through animal membranes. Accordingly, there remains only the assumption of an active condition which may be denominated transudation or secretion. Now, how about irritation? Here also we will not be far amiss in claiming a transudation or secretory process."

Bürgers expresses in the following sentence the existing conditions during an infection: "Therefore, during infection, the clinical and experimental discoveries point to only a slight fluid change in the vitreous body."

K. Wessely, who dealt with the subject from the ophthalmologic standpoint, viz., in the light of the pathologic experience of the majority of the oculists, who contend that a fluid current occurs from the ciliary body to the anterior chamber by way of the canal of Schlemm, seeks to harmonize this standpoint with the bacteriologic experience.

"Intraocular fluid production, according to this, represents a transudation process of a special kind whereby, under normal conditions, certain substances of the blood are entirely shut out of the interior of the eye: e. g., albumin, including the antibodies, and even foreign, crystallizing substances. Herein consists a substantial difference as compared with the lymph production,

and it is consequently not correct to designate the chambers of the eye as single lymph spaces, which frequently happens. Moreover, the boundary between this and the purely secretory processes must be sharply drawn. It is possible, even probable, that certain vital properties of the ciliary epithelium or of the capillary epithelium in question, play a role in the production of the eye fluids. But a true secretion is characterized by the fact that it is independent in a large degree of the blood pressure and by the formation of certain substances which are foreign to the blood, or exist therein in much smaller proportions, both of which do not occur in the eye fluids. As has been shown, just this dependence upon the blood pressure characterizes the intraocular fluid production as a type of transudation process, and its peculiarity as contrasted with other analogous processes, lies only in the extraordinary decomposing tendency of its component elements, especially in regard to its albumin contents."

From the conclusions found in the reports of the convention of 1910 may clearly be seen, that concerning the fluid circulation in the eye, we have for years taken no step in advance.

It may be accepted as surely proven that a current of fluid originating from the ciliary body or from the blood capillaries of the ciliary process, passes anteriorly through the pupil into the anterior chamber, and makes its exit at the angle of the chamber into the vein of the canal of Schlemm; all else is not proven.

Not in the slightest measure, even, are the elements of nutrition transmission and nutrition requirements admissible, although the above writers consider them firmly established. General physiologic considerations even favor the acceptance of the opposite opinion as more probable. The retina, which subserves the function of vision, shows, as has been fully pointed out in the life changes in the visual cells, a decided metabolism which necessarily requires a correspondingly lively influx and outflow of blood and fluids. Likewise may be mentioned the clinical fact, that the eye actively responds to general, systemic diseases which cause a pathologic change in the blood and fluids of the body. I refer here to Bright's disease of the kidneys and diabetes.

Accordingly, I can not in the least concur with the following opinion of Wessely: "The propounded peculiarity that nor-

mally the collodial and serum constituents are so decidedly excluded, almost unquestionably bears a close relation to the requirement for transparancy of the media of the eye. Accordingly, the nutrition requirements and nutrition ingress into the eyeball are reduced to a minimum, since it must never be forgotten that the first function of intraocular fluids is an optic and static one, and that they repesent only in a second degree fluids of nutriment." There might, however, be an equality of the three functions, and one could imagine that the collodial serum constituents required for nutrition are being consumed in the retina and choroid, thereby subserving their function, and in this manner avoiding entrance with the fluid current into the vitreous, and affecting the clearness of the media. By their absence they would act effectually. Be that as it may, the extraordinary development of the vascular system of the choroid and retina, which is much greater than that of the ciliary body, justifies the opinion of the existence of a generous supply of fluid in the eye. This, however, must have an exit passage. Posterior passages of egress at the optic nerve and the emissaries of the vortex veins are not established with certainty, and should they really exist, the exit of fluid could be only scanty. The efficiency of the exit at the optic nerve is given as only one-fiftieth of the outflow from the iris angle. The posterior passages are accordingly not to be considered and may at most be accepted as accessory or collateral. Consequently nothing remains but to assume a fluid current from the posterior to the anterior portion, which may possibly pass through the vitreous. The prevailing opinion, in contrast with this, inclines toward the supposition that a nutrient current for the vitreous exists, although not of much importance, which arises from the ciliary fluid and is directed posteriorly.

But here, too, the question must be decided on the basis of experiments.

The school of Leber resorted to manometry, and found that there exists no potential difference between the fluid in the vitreous and that in the anterior chamber. Therefore, no fluid stream can be assumed at all, either from the anterior chamber to the posterior, or vice versa. Manometry of the eye proceeds from the supposition that the organ of vision is a simple capsule filled with fluid, an assumption which is fundamentally

wrong. The vitreous body is without any doubt a finely meshed tissue which responds to pressure on its fluid in such manner as to oppose fluid currents, exerting a counter pressure. If now, by means of manometric experiments, an equality of pressure is revealed in the vitreous and in the anterior chamber, current obstruction being absent in the latter, we must accept a higher value of pressure in the vitreous chamber on account of this structural resistance. That the resistance of the vitreous body is not uniform, and that this fact must be taken into consideration, may be observed from the behavior of vitreal prolapses in eyes with normal vitreous, and those with an abnormally liquid vitreous.

Manometric experiments are, therefore, not at all a competent proof. Much rather might they serve as an indication of a current from the vitreous to the anterior chamber.

The logical sequences of the Leber method of reasoning, which, in the questions under consideration, possessed a dogmatic authority, arouses suspicion also on other occasions, so that one can with right and reason assail this temple of faith.

Leber, e. g., attempts to explain the fact that the eye upon increase of pressure becomes more spherical, as follows: "The reduction of an increase of volume following increase of pressure depends, besides the general behavior of the elasticity of organic bodies, upon the condition that both the sclera and the cornea deviate considerably from the spherical form It is to be supposed that upon increase of pressure there follows a decrease of this deviation from the spherical, i. e., an approach to the spherical, since a spherical body of a given surface has a greater volume than any other form of body. If we inject fluid into the eye, the pressure required, having a tendency to distend the capsule, will at the same time serve to equalize the inequalities of the curvatures of the ball. This may in part occur through mere curvature deviations, to which the eye offers less resistance."

To this I recently remarked: "Leber does not take into consideration here the variations in the resistance existing in the individual sections of the wall of the bulb, and he could be right only in case the previously existing deviations of the bulb from the spherical through flattening, e. g., at the sulcus scleræ, or bulging, at the cornea, had occurred in a wall of equal thickness and firmness, which deviation had then by in-

crease of pressure become equalized. But it is just the region of the sulcus sclerae which is always reenforced by extra layers of fibers, and, on the other hand, it appears that the cornea on the whole is less resistant than the sclera. Therefore, taking for granted the proposition that the fluid pressure at all parts of the inner surface of the wall is equal and vertical from the center, the distension of the bulb must correspond with the amount of resistance existing in the various sections of the wall. From this it would follow that there would be greater distension of the cornea and less distension of the reenforced sclerocorneal ring. If, on the contrary, Leber's views were correct, we might expect that deviations from the sphere occurring in glaucoma as staphyloma sclerae, would, in spite of thinning of the wall, become equalized by distension of the sphere, i. e., these departures from the spherical form would become equalized (flattened) on account of the increased intraocular pressure. The cause of their appearance would thus become the cause of their removal. Hence, the Leber explanation can not be correct."

The other method of pointing out the course of the intraocular fluid currents consists of experimental injections. In general, the same conditions apply here which I laid down in my dissertation in 1896, "Conveyance of Iron by Means of the Fluid Current Into the Lens of the Eye." I then stated:

"Since the anatomic structure of the lens offers few points of advantage to observe its system of nutrition, it was sought to solve the problem by means of experiments."

A number of these experiments have the common characteristic of injecting into the supposed fluid passages of the lens certain chemical substances of only slight physiologic difference, these having first been introduced into the lymph channels of the body in some manner, from where they have found their way into the eye and the lens, thus rendering the passages visible. In the selection of these substances a material difference arises. One class of investigators employed solutions which could be demonstrated in the lens after enucleation by the appropriate reaction; but others, on the contrary, resorted to solutions which found their way into the lens of the living animal and were visible by virtue of their colors. To the former belong Kniess, Ulrich and Deutschmann; to the latter, Schöler and Uhthoff; Schlick employed both methods of procedure.

In a number of other investigations it was sought to determine the course of the lens fluids by observation of pathologic appearances of cataract due to nutritive disturbances. In order to study the individual phases of cataract, they were artificially induced. Magnus employed naphthalin, salt or sugar; Schlösser made experimental studies of traumatic cataracts and arrived at definite conclusions concerning the course of circulation in the lens.

After Samelsohn made the observation that in lenses into which by accident a particle of iron had entered and remained for an extended period, a migration of the dissolved portion of the iron occurred, a repetition of this accidental experiment was suggested. We have thus a procedure which in a fundamental sense represents the two methods recited above. In consequence of an injury to the lens by a particle of iron, a traumatic cataract results, a disturbance of the circulatory changes; while because of the solution of the iron, its migration occurs by virtue of the circulation. So, while by means of the study of the general lymph current of the body, for the purpose of investigating the question here under consideration, the discovery of the connection between the nutritive system of the lens and that of the eye was anticipated, that is, the ascertaining of the origin of the same, it is to be hoped that by means of the current of the lens itself, the continued course, the termination and exit of the fluid current may be studied. Experimental investigations of this kind have been made by Austin (1891), and von Hippel (1894).

Dr. Schlösser, as early as 1894, introduced iron particles into the lenses of a number of rabbits and made observations of the resulting changes. He was kind enough to present to me for investigation two of the operated eyes."

We thus have a summary of the experiments belonging to this category.

However, the results derived from these researches do not bear a searching criticism. In addition to phenomena of diffusion and osmosis which accompany the currents, and which may arise postmortem, they also lack uniformity in other respects. The discoloration which plays the most important role is not everywhere uniform, but diminishes in one direction, so that an increase as well as a decrease of discoloration may equally indicate the course of the current. Thus, Ulrich ob

served, e. g., upon subcutaneous injection of a solution of ferrocyanid of potassium, postmortem appearances in the eye with the use of chlorid of iron, consisting of a staining with Berlin blue with sharp borders, which was most marked in the anterior limiting membrane of the vitreous, contiguous to the equater of the lens, and which gradually decreased in intensity toward the center of the vitreous. From this Ulrich assumed the existence of a current flowing from the center of the vitreous body anteriorly, which deposited more ferrocyanid of potassium in the denser peripheral portions. But with equal consistency this may be taken as an indication of a current in the opposite direction. The fading of the stain in a posterior direction may be accounted for by a current passing posteriorly and depositing in the more dense peripheral portions of the vitreous the greater amount of its color contents, so that in passing back to the deeper parts of the vitreous, it loses more and more of its color substance, thus effecting a lighter staining of the posterior parts. But, after all, the variation of discoloration might be merely an expression of the difference of tissue density.

From this example may be seen what little value all such investigations possess. The lens presents an exceptional condition, inasmuch as here the conditions are more simplified, and the only result to be expected from the investigations mentioned was the ascertaining of the point of entrance of the nutritive fluid, without regard to the further course of the same. The introduction of iron particles into the lens at various points also served, by means of tapping the "surface water," to demonstrate that part of the current course which is below the point of puncture. The points of exit at the anterior part of the lens capsule are probably the points in the epithelium of the lens which Samelsohn found rust stained, corresponding approximately in location to the insertion of the zonula fibers. Morano was the first to observe stomata at the same place, which finding was disputed, but was corroborated by us. I described them as follows: "On an oblique section of the capsule, in front of the equator, may be seen three circular gaps, circumscribed sharply with epithelium. When joined by lines these form a triangle. Their location in the vicinity of the insertion of the zonula fibers and the sharp circumscribed borders give rise to the opinion that we are here dealing with the supposed stomata of the anterior capsule."

The result of my investigations, accordingly, was a confirmation of Schlösser's views on the fluid current of the lens. Hence, it is highly probable "that the nutritive fluid enters the lens at the equator, from which point it passes to the posterior pole through the posterior lens star into the perinuclear canal system, finally, after entering the anterior lens star, making its exit through circularly arranged orifices on the anterior surface" (Schlösser). The important elements that may be mentioned which condition a lens current according to Schlösser's meaning are the lenticular nucleus, the nuclear crescent, and the accommodation. The lenticular nucleus being an impermeable hindrance, forces a curve in the course of the nutritive current. According to Schlösser, the nuclei of the lens fibers are not arranged like the shots or bullet in a gun barrel, but they distend the fibers somewhat. From this it may be easily conceived that they hinder the forward flow of the nutritive current at that place, and in the fashion of a current-break, tend to turn the flow toward the anterior pole.

As regards the influence of the accommodation upon the lens current, I reach this conclusion: "According to O. Becker, the accommodation causes perinuclear gaps, the firm nucleus taking no part in the movements of the elastic cortical layers, so that a space is created between the nucleus and the cortex. Admitting this, it follows that by the act of accommodation there must ensue at intervals vacuum gaps into which the nutritive fluid is drawn and from which the fluid is forced out in the following phase of the process. Thus the process would seem similar to that which according to C. Hasse occurs in the case of the fluid currents into the anterior eye chamber, as well as those of the lymph currents in cartilage and bone. The accommodation, then, acts as a pressure and suction pump. The nuclear crescent, according to our simile, would act as a valve, inasmuch as on the one hand it forces the current to turn toward the perinuclear region, and on the other reduces the suction upon the region anterior to the nuclear crescent near the place of reflection of the epithelium. Since we are to seek at this angle the exit of the fluid current, the nuclear crescent would to some extent offer protection against escape of lymph from the lens in central aspiration.

IX.

THE SUCCESSFUL PROOF OF THE INTRAOCULAR FLUID CURRENT BASED ON THE PRINCIPLE OF MECHANICAL ADAPTABILITY.

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Translated by T. T. Blaise, M. D.,

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To experiment is to investigate Nature, who replies in the language of form or form changes perceptible to the senses. "It is, however, an art so to state the query, and so to apply our means of experiment, that Nature must answer in an intelligible manner. It is therefore necessary to have in advance a mental conception of the results to be obtained by the investigation, to have previously analyzed the process, to have at least in theory separated the same into its final factors, in order to artificially evolve conditions in which possibly only one such factor is altered." (W. Roux.)

Since in case of the lens of the eye the examination of the investigated organ is less difficult, because the relations are simpler, the putting of the query was rendered simpler. Thus one is enabled to comprehend whether the answer is definite and the discovered current relations correspond with the actual facts. For the entire remainder of the eye the current conditions present no such simplicity as is accepted by Leber and his school; on the contrary, they seem highly complicated, so that the solution of the problem by means of experimentation must be declared almost an impossibility. In order to obtain this priorily necessary conception, and to devise a plan for experimentation, there remains one method at our disposal, which from a fundamental viewpoint corresponds with the formal expression of the experiment, rendering at least an equal value

of proof. This rests on the assumption that in Nature the principle of purposeful adaptation is active, and that forms in Nature are the exact, mentally perceived expression thereof. It is not here the place to elucidate in detail the validity of this proposition. I will merely bring out the fundamental meaning, according to which man is also one of the corporeal constructions of Nature, and with all of his thinking and activities is dependent on the natural organic flux, so that this purposeful adaptability in his activities, which we are in the habit of denominating reason, is to be viewed as an expression of Nature. From this it follows that we must view all Nature in the light of purposeful adaptation. The unrestrained application of our concept of the influence of causation on organic bodies has been brushed aside during the last epoch of natural investigation as scientifically inapplicable. But the purposeful concept as an heuristic principle of physiologic experimental art, has been reinstated by Bunge, and is gaining more and more in favor.

It is unintentionally applied by Wessely, and this is of great interest in the question at hand, when in the opinion rendered by him in the introduction, he connects the extensive retention of colloidal serum constituents with the necessity of transparency of the intraocular fluids.

Finally, the fact of this retention of colloidal substances and the assumption that "certain vital properties of the ciliary endothelium or the corresponding capillary endothelium are concerned in the synthesis of the eye fluids," are evidences of the efficiency of purposeful adaptability. It is a case of transudation processes of a peculiar nature, which recalls the experimental work of the genial Russian physiologist, Pawlow and his pupils, "which as a planned work of research had a teleologic influence upon the mental conception regarding the character of the digestive glands, and as a consequence of their labors revealed such remarkable participation of the central nervous organs in the purposeful character of the digestive process that they exceeded the expectation of the physiologists." The means correspond with the purposes: "Upon all refuse material without exception" writes Pawlow, "a thin, liquid spittle flows from the mucous glands, containing only a trace of mucin, while a tough spittle, rich with mucin, is secreted upon all acceptable food substances, rendering the food

bolus slippery in order to facilitate its gliding into the stomach." This experimental fact from the extended series of Pawlow's researches may suffice to call our attention to the analogy of the vital character of the endothelium which withholds the colloidal and other substances for the purpose of maintaining the transparency of the eye fluids, thereby exhibiting rationality of action. If as Pawlow says in the introduction of his third lecture: "It has been shown that both the glands of the stomach and the pancreas are endowed with intelligence," then we also say in regard to the selective function of the ciliary epithelium and endothelium of the capillaries, that optically they act purposefully for the maintenance of the function of the organ of sight.

I have applied the idea of purposeful adaptation as a heuristic principle to the investigation of the fluid currents of the eye. In response to the editorial request of this publication, I shall report on the results of my investigations, which appear in a series of treatises in the *Zeitschrift für Augenheilkunde*. These treatises were also collected and published in monograph form under the title, "The Intraocular Fluid Current and Its Relation to the Biomechanical Construction of the Eye Under Normal Conditions, in Glaucoma, and in Myopia."* As may be gathered from the title, it deals with a purely technical and physico-mathematic consideration, though elementary in manner, which is little in harmony with the present day thought of the medical man: "I know very well that at present in medical circles a decided dislike for mathematic discipline prevails. This is to be regretted for various reasons. This aversion of many may be partially explained, in that they have accustomed themselves to see in mathematics an entirely abstract science, regardless of the importance of its application to concrete cases. Precisely the knowledge of the elasticity and the solidity of the tissues presents numerous points of contact with the course of practical life, so that often the combination of the mathematic manner of presentation with this knowledge gains a few more adherents." (H. Trippel.)

In order to stimulate the attention of the readers of this article and to arouse their interest in the following report, I take the liberty to preface the same with the opinion of O.

*S. Karger, Berlin.

Parisotti of Rome on my work, given in the *Rivista Italiana di Ottalmologia,* Anno VI, October-November, 1910, Nos. 10-11. At the same time, I take this opportunity to express to him my sincere thanks.

"This book is a true study of the architecture and hydraulics of the eye. It was a genial inspiration of the author to put the mechanic and hydraulic conditions of the eye at the service of the students of ophthalmology. A glance at the drawing on page 8 is sufficient to get an exact conception of the work.

It is impossible to give a resume in a few words or lines of this work, which though relatively small in bulk contains ideas of infinite value on the relations of the intraocular fluids and their passages within the eye. If we can doubt that the application which the author makes of the general laws of mechanics and hydraulics to the eye is always exact, nevertheless it is certain that the work will aid in correcting some of the ideas and theories by which the pathology of various disease processes are explained and which, in practice, are of the greatest importance as a basis for the therapy, which will supplant the empiric therapy, based on erroneous premises. The author, therefore, directs his attention chiefly to glaucoma and myopia, in which diseases the mechanic structure of the eye and the circulation of the fluids are of the greatest importance."

I.

BIOMETRY: A PRACTICAL AND CONVENIENT METHOD FOR THE INVESTIGATION OF THE MECHANICAL CONSTRUCTION OF THE EYE.

The principle of the minimum effect, which was proposed by the French philosopher Maupertius, finds in modern machine construction its constant actualization, when the engineer with the least possible amount of material obtains the greatest possible effect, or with a given amount of material achieves the greatest possible effect. We find in the animal and vegetable kingdom, as also in the human body, numerous instances of constructions where the socalled minimum-maximum problem is solved. We denominate them as mechanically adjusted and mechanically adaptive.

Since in the anatomic construction of the human eye there

are a number of findings which are to be interpreted in the sense mentioned, I investigated the problem whether or not the entire eye was of such architecture as to be designated mechanically adapted.

The method which I employed is based upon the fundamental laws of statics and the laws governing density, and consists therein, that, taking into consideration the specific density, we can from the direction, position and strength of parts of structures and whole structures ascertain the existing strain or pressure of single forces and entire systems of forces. One may also proceed in the reverse manner by calculating the corresponding corporeal construction of already known forces or systems of forces.

An example, illustrating the basis of the following calculations may make this plain. Filling a rubber bladder tensely with liquid, i. e., producing pressure from within, we are enabled by means of the sphericity and uniform strength of the bladder wall to conclude there is a uniform and radially directed force, located within. If the specific density of the rubber is known, the same will, in connection with the cross-section of the wall, give us an opinion of the extent of the inner pressure.

We may conversely conclude as to the spherical form of the container, from the pressure of the fluid from within the bladder, which, as is known, presses radially and uniformly in all directions from within against the wall. The one manner of procedure is the reverse of the other; the opportunity thus presenting itself to test the experimental example and make reciprocal control tests.

Primarily, however, our attention must be called to the difference between the density of dead and live material. In inorganic, elastic bodies the stretching distance is directly proportional to the expanding force, but in organic animal bodies it decreases continually under continued, uniformly added pressure.

The fact of this peculiar behavior proves without further discussion that in animal structures the maximum-minimum problem is fundamentally solved and the mechanical adaptability much more firmly established than with artificial constructions, which, according to the natural laws governing

force and change of matter, can be constructed only with a view to the maximum pressure.

The results of my investigations were as follows:

II.

THE ARCHITECTURE OF THE EYE WITH REGARD TO ITS HYDROSTATIC RELATIONS TO THE INTRAOCULAR CURRENT-COURSE.

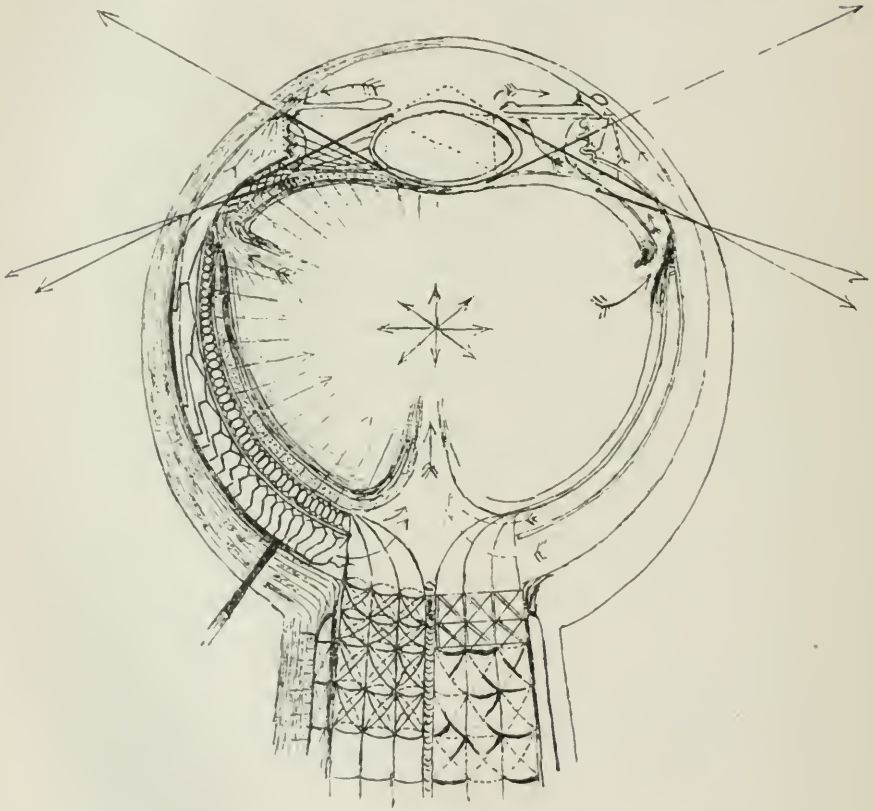
The structural material in whose arrangement the desired architecture is recognized, consists almost exclusively of highly elastic tissue. The accompanying pressure, on the other hand, is also known, the same residing in the intraocular pressure of the tissue fluids, which is ultimately traced to the contractile force of the heart muscles. The power of the heart muscles and the resisting power of the elastic tissues act as antagonists, and together constitute the fluid pressure or turgor of the organs, and so likewise of the eyes. This reciprocal interaction between the two forces presupposes their similarity of action. This is in fact the case, because both sources of power are inexhaustive and do not become fatigued, and it will be shown that there likewise exist correspondence in principles in the construction of the heart and the eye, and both, like the object and its image in the glass, harmonize symmetrically one with the other.

With regard to position and boundary, mass and density, direction and course of the several tissues, a marked diversity obtains between the external sclerocorneal tissues and all the internal tissues. The former is amply designed for the purpose of being the sole supporter of the intraocular fluid pressure and serves besides as a firm skeleton for the external and internal ocular muscles and also the more delicate internal tissues. On the other hand, the fluid pressure within the eye is regarded as a sequence to a fluid current, determined according to hydrostatic laws. We may then announce our hydromechanic conception of the eye in a general formula as follows: "The eye is an almost spherical, elastic capsule entirely filled with a moving fluid, the greater part of the interior containing a weak obstruction to the current."

Above all the eye is not, as is proposed by the experimental investigations that neglect the existence of the tissues of the

vitreous body, a simple capsule filled with fluid, the hydrostatic pressure of which may be determined scientifically with the manometer.

The teachings of Leber regarding the fluid pressure, which are based thereon, seem fundamentally wrong and lead to erroneous conclusions. The ingress and the egress is effected, in the main at least, by filtration—the ingress through the walls



of the capillaries of the choroid, the retina and the ciliary process; the egress into the veins of the canals of Schlemm. The remaining channels of exit at the optic nerve and along the vortex veins (venæ vorticosæ) have not with certainty been determined, and on account of their inferior efficiency can at most be viewed only as accessory exits.

The filtration surfaces of the inflow are obviously larger than those of the outflow. If instead of the filtration process we substitute the simple process of a current passage through tubes, then we may complete the above formula and state: The eye represents a spheroidal expansion of a tubular channel, of which the ingress tubes are decidedly larger than the egress tubes. On the basis of the laws governing currents in tubes, we arrive at the following conclusions:

1. The current speed within the eye is low.
2. The intraocular pressure is very high.
3. The intraocular pressure as lateral pressure upon the wall of the bulb must decrease in the direction of the current course.

If now the eye is constructed with the use of the least amount of material, i. e., according to the principle of purposeful adaptation, then, in conformity with the above mentioned principles of adaptation, the eye must present the following form:

1. Since, in consequence of the reduced current speed, the conditions approach those of a bladder filled with a motionless fluid, it necessarily must assume approximately the shape of a sphere, but not entirely so.
2. In accordance with the internal pressure, its density as also its thickness must be quite considerable.
3. This must decrease in strength and resistance in the direction of the current.

Anatomic investigation teaches that all of these three conditions obtain in the sclerocorneal capsule.

The latter decreases in strength and resistance posteroanteriorly, indicating thus that the fluid current must flow in the same direction.

The points of entrance and exit are located in distinct harmony with each other. Posteriorly are found the more copious sources, the blood vessels of the choroid and the retina, and anteriorly, at the angle of the anterior chamber, the comparatively smaller area of exit is located. Even the ciliary source of fluid is located up stream.

Be that as it may, we can with greater justification base our claim of a probable posteroanterior current descent upon the relative distribution of strength of the corneoscleral capsule than upon experimental research. But we are fortunately in position to present further proofs pertaining to the constructive arrangement of the interior tissues.

According to the above formula, the internal tissues present to the current a hindrance which fills the largest part of the bulb, i. e., the posterior. If this is true, then there must be an increase of pressure towards the source of the current, due to engorgement putting a correspondingly greater strain on the posterior wall of the bulb. We find herein, then, a particular cause for the increasing thickness of the sclerocorneal capsule from the front backwards, which is actually present, but which would seem somewhat excessive in the case of a simple, unobstructed current.

The mechanical construction of the interior of the eye is as follows: In the middle point of this part of the architecture, which is enclosed by the wall of the bulb like the works of a watch in an outer capsule, is the retina, representing a column or pillar structure lying between the inner concave surface of the choroid and the outer globular surface of the vitreum. This pillar-form character of Müller's fibers is shown by (1) the form, (2) the radial arrangement, (3) the rigid construction, (4) the adjacent anchorage and stiffening. The construction also seems adaptive, since it insures the purpose of the organ of vision, i. e., since it serves as a supporting and isolation apparatus for the nerve elements, and at the same time prevents compression of the retina, either from within or from without. The bilateral pressure upon the retina, caused by the pillar arrangement, is radial in direction, corresponding to the spherical surfaces bordering on it, acting from the side of the choroid centripetally, and from the vitreous body centrifugally. The retina accordingly seems a special framework which is amply adjusted to the accompanying centrifugal and centripetal stress. This applies also to the adjoining tissues.

The choroid is an erectile structure which seems to be adapted to exert a radial, centripetal pressure upon the outer surface of the retina. In the character of its construction it corresponds fully with this function, and may be viewed as a tri-dimensional framework intended for a fluctuating pressure in the sense mentioned.

Viewed as a single membrane under stress, there must exist active strains in the same manner as exist in a tensely filled rubber bladder and likewise in the sclerocorneal capsule which strains may be divided into two components, the tangential and the radiocentripetal. They correspond to the special construc-

tion. We observe here two networks of blood vessels and of capillaries, one of which, the layer of the large vessels, lies exteriorly next to the wall of the bulb; the other, the capillary layer (choriocapillaris), lies interiorly, adjacent to the surface of the vitreous, while the layer of the medium sized vessels is located between the two, separating them. The two concentric networks present in general a meridional and equatorial arrangement of their constructive parts, in which the elements running in parallel direction multiply posteriorly. Consequently the network appears to become denser and finer meshed from before backwards. This arrangement fully corresponds with the special conditions of tension which we must assume in view of the mechanical conditions. Both networks are essentially constructed with regard to centripetal tensions. The centripetal tensions, being components of the choroid as a whole, are pressure tensions. The vessels of the middle layer seem to be formed in accordance herewith, because they have an arborescent form, although they are designated as terminals, and thus imitate the arrangement of pillars or columns with arms extended in all directions toward the inner network of the small vessels. The choroid corresponds herein essentially with the pillar system of the retina. One may designate both as bridge formations.

The middle portion of the smaller end arbors present a bayonet shaped, double kinked course, the more so the farther they lie forward, the original and last parts being radial in direction, and the middle portion more tangential. The arrangement of the separate end arbors is usually of such character that the anterior portion of the stems of the posterior end arbors or their tangential middle sections extend over the posterior end portions of the intermediate section of the one nearest anteriorly, thus forming a cover, in the manner of roof tiling, which rests on the peripheral parts or origins, i. e., on the roots of the end arbors; the apices are supported internally, and these, in turn, support in the form of pillars the inner capillary net of the choroid. In this manner a two story bridge is formed. Since this rests against the unyielding, adjacent wall of the bulb, the pressure can act only in the direction of the retina. This is especially aided by—

(1) The inherent tension of the tissues.

(2) The force of pressure and impulse of the blood current

within the vessels, viz., by way of an expansion of the bayoneted, S-shaped end arbors.

(3) The pressure of the secreted tissue fluids in the interstices of the choroid.

It is to be noted at this place, that the retina on both of its surfaces is isolated by elastic, homogeneous membranes, so that it is in direct combination with the choroid only at the entrance of the optic nerve, and further forward, towards the vitreous body, by means of the tissue meshes of the nerve head.

The inner pressure on the retinal pillars can come only from the vitreous body. The framework of this suggests the structure of an orange and represents a system of radial, meridional and equatorial tensions, the two latter forms increasing in number toward the circumference, and forming a dense texture of connective tissue fibers intersecting at right angles.

The limiting membrane of the vitreous body resembles in the arrangement of its constructive elements the structure of the choroid, as far as the two superficial, vascular networks are concerned, and the fiber intersections which have been demonstrated in the sclerotic portion of the bulb wall. We are therefore justified in claiming for the limiting membrane of the vitreous body the same mechanical function, which consists in propagating, by means of its components, the pressure on the walls centripetally. In the same way the tension will affect the radial fibers only, on account of their delicateness and pliability. Thus the total mechanical action of the vitreous structure would consist in the exertion of a centripetal pressure, and in the support as a vis a fronte of the pressure of the choroid displacing the retina centripetally.

The only pressure upon the retina from within in opposition to the choroid, is that of the fluid pressure of the vitreous body. The decreasing density and the rigidity of the pillars of the end arbors, passing from behind forwards, and the proportional decrease of the blood pressure in them, which as in manometer tubes indicates the lateral pressure in the ciliary arteries which run from behind forward, is proof of a concomitant decrease of the exterior pressure on the retina by the choroid, and indirectly of the inner pressure, which, as a reactive pressure, must correspond to this. Based upon this fact, we must acknowledge a vitreous current which passes from behind forward.

The zonula-lens system lies adjacent to the anterior surface of the vitreous body, and is under pressure on the one side from the vitreous, and on the other from the fluid in the anterior chamber. The former pressure is sustained by the zonula fibers which run from behind and laterally toward the anterior capsule of the lens, the latter by those zonula fibers which from before and laterally intersect the former fibers and pass to the posterior lens capsule. The fiber intersection gives the zonula-lens system the character of a framework bridge with diagonal bracing. The anterior lens capsule with its fibers is constructed stronger and has more resisting power than the posterior lens capsule with its fibers. If here again the principle of economy prevails, and if above all, under the presupposition of a fluctuating pressure, the maximum-minimum principle is solved, then the fluid pressure in the vitreous body is greater than in the anterior chamber. Herein also do we see evidence favoring the existence of a current in the vitreous which flows from the back part to the front and empties into the anterior chamber.

It has already been mentioned that the tissue spaces of the choroid are connected with those of the retina by means of the meshwork of the optic nerve head, while elsewhere on all sides the two are effectually separated by a homogeneous, dense, elastic membrane. A connection exists in the same manner farther forward toward the vitreous body. At the optic nerve head, beginning with a widened funnel shape, is the canal of Cloquet, passing into the interior of the vitreous body.

Anteriorly and laterally there is an interruption in the limiting membrane of the vitreous body at the socalled zonular fissure which leads into the depression between the ciliary process and is converted into a canal system by the overroofing of the adjacent anterior limiting membrane of the vitreous. It leads via the posterior chamber and pupil into the anterior chamber. Thus the connection between the several current sections would be established.

The last proof of our proposed current course I deduce from the opposite behavior of the canal of Cloquet to that of the zonular fissure when under a fluctuating pressure of the vitreous body. These two portals of passage acquire thereby the character of valves which permit only of a fluid current in accordance with our conception. Of this we shall speak later.

It is shown by all the anatomic facts mentioned that the construction of the eye is a harmonious one and that the opinion of an adaptive architecture is justified. It stands in closest interrelation with the intraocular fluid current. The aim of this can be only the conservation of the function of the organ of vision. For this reason the retina is located at the middle point of the harmonious structure. But the function stands in need of protection, since, as is the case in all biomechanic constructions, there constantly occur oscillations in the tensions, due to the blood and fluid currents as well as to the motions of the body.

III.

THE ARCHITECTURE OF THE EYE A REGULATING MECHANISM FOR THE INTRAOCULAR PRESSURE AND CURRENT FLUCTUATIONS.

The architecture of the eye, from the standpoint of statics, presents the properties of a framework equipped for the elements determining the character of the organ, the visual cells and their nerve conductions on the one hand, and the optic constituents on the other. The sclerocorneal capsule represents an external tissue skeleton, while the internal architecture presents the character of an internal skeleton.

All biometric constructions, however, are constructed with regard to a fluctuating strain followed by movements. We must therefore view the established architecture from the viewpoint of motility, i. e., view it as a machine and attempt to explain it in accordance with the laws of dynamics.

The fluctuations of the intraocular fluid pressure which alone bear directly or indirectly on the question, have their prime origin in the motions of the entire body,—or in those of the eye itself,—since these produce on their own part wave motions and rotatory motions in the vitreous body (Best). Fluctuations of the intraocular pressure are also conditioned by the changing strength of the ingress and egress of the blood supply. Even the individual pulse waves, the active and passive hyperemias, as far as they are based upon the body circulation, and above all the so-called occupational hyperemia which must affect the activity of the organ of vision, all have their bearing.

Fluctuations of the intraocular pressure must naturally inter-

act with the movement changes of the intraocular fluid currents, which meet with obstructions in the tissues traversed and are thereby rendered ineffective. This is essentially the case in the two groups of pressure fluctuations mentioned. The equalization of the fluid fluctuations caused by the varying blood supply was the object of my third treatise on which I have to report.

The sclerocorneal capsule is not very yielding, and for this reason behaves almost like a rigid, stable capsule. If it alone were concerned, the uneven current flow in the eye would behave similar to that inside of rigid walled tubes, i. e., if a certain amount of fluid under a given pressure is forced in, an equal amount will flow from the other end, and the current will assume a jerky manner of sudden rise and fall of the fluid pressure. From the standpoint of adaptability to efficiency, such behavior could not serve the function of vision. It seems therefore reasonable that appropriate regulation should exist in the eye. The means which alone meet this purpose are the interposed obstructions, consisting of the internal tissue structures. They act (1) by means of obstructive friction solely; (2) by means of their elastic counteraction of the current, which seems particularly adequate on account of the peculiar character of its organized elasticity by which the contraction automatically increases in rapidity faster than the current pressure; (3) by means of the constructive arrangement, in the sense of the balancing of the pressure fluctuations and the uniform current.

Let us now imagine the entire fluid current as a tubular one; we have then a system of two symmetrically and contiguously arranged S-shaped tubes enclosed in an outer capsule. In the loop which is formed by the choroidal current with the vitreous current of the same side, lies the retina and its fluid current; in the loop which is formed by the last part of the vitreous body current with the ciliary section, the crystalline lens is located.

Based on this general foundation, we are enabled to deduce and elucidate by mechanical laws the peculiar character of the regulative apparatus presented to us by the architecture of the eye. In accordance therewith, an overbalancing of the outer pressure on the retina is effected by the increased blood supply, by increased filling of all the choroidal vessels, by a straighten-

ing of the kinked, bayonet shaped stems of the end arbors, and by increase of the fluid pressure due to increased fluid production. In this way the choroid resembles an erectile body, which, because of its location against the inner side of the unyielding bulb wall, must tend to displace the retina in a centripetal direction. The bridge-like framework of the retina forms a relatively rigid structure, answering therefore the purpose of protecting the vision cells against pressure. The displacement of the retina as a whole toward the center of the vitreous body must be accompanied by symptoms of compression. The ensuing increased fluid pressure in the vitreous, acting in all directions, effects a closure of the funnel shaped canal of Cloquet, which extends inward, and by pressure on the anterior limiting layer of the vitreous body and the contiguous zonula-lens system, it effects a distension of the zonular fissure, so that the two passageways in the vitreous circumference act like a pair of valves, which simultaneously permit a fluid displacement from the back forward. Consequently the fluid pressure is propagated anteriorly into the anterior chamber, so that an augmented filtration into the canal of Schlemm ensues.

The action of the choroid as an erectile body would accordingly consist of an acceleration of the fluid current outward. The obstructions consisting of the zonula-vitreous as well as the zonula-lens pressure, which resemble the tension of a spring, must be overcome.

With the gradual depletion of the vitreous body the pressure again drops and the action of the two valves reverses itself. The zonula pressure pushes the anterior limiting membrane of the vitreous body backwards in such manner as to close the cleft in the zonula. But the canal of Cloquet, on the contrary, is relieved from pressure and opens. The reaction upon the fluid current from this is as follows: The current of the choroid, checked during the closure of the canal of Cloquet, flows now freely without hindrance into the vitreous chamber, which in turn becomes again engorged on account of the closing of the anterior valve in the zonula fissure. During the decrease of the previously elevated pressure in the choroid, the fluid pressure in the vitreous body rises, and from this ensues a pressure upon the retina, directed outwards. Thus the vitreous body also represents an erectile body, it

being suggestive of another erectile body, viz., the glans penis. When the pressure elevation of the vitreous body becomes active, the retina is displaced in a centrifugal direction and compresses the choroid against the scleral wall of the bulb. Since the resisting power of the choroid decreases from behind forward, and since the pressure of the vitreous body upon closure of the anterior valve represents that of a fluid body in a state of rest and is uniform on all sides, the choroid necessarily must become progressively compressed in successive steps from before backwards, by which the fluid current escapes posteriorly through the nerve head, and prior to the time of the flow into Cloquet's funnel receives the retinal current. The latter current, on account of the rigidity of the pillars of the retina, takes little or no part in these fluctuations, which, as far as concerns the function of vision, must be viewed as a purposeful adaptation.

Due to a corresponding elevation of the vitreous body pressure, this state finally reverses itself again on account of the forward push of the pressure of the zonula lens and vitreous body and the resulting opening of the zonular cleft. The condition then again is as it was in the beginning of the equilibrium disturbance, so that the procedure may start anew. If in the meantime no renewed wave of the blood current occurs in the choroid, after a briefer or longer balancing the tension of the inner architecture will again come to a state of rest, and a uniform current will be established. In any case, there will be a reduction of the intraocular pressure and its equalization.

The forces that operate in the mechanism are the contractile force of the heart muscles and the spring-like elasticity of the mechanical construction of the eye. They are related to each other like action and reaction; with this agrees the fact that during life neither ceases and their interaction continues without interruption. It is significant that both in the heart and in the eye the hydraulic principle of the mechanism of a pump is applied. The eye is the reflected image of the heart.

With the fluctuations of the tissue-fluid pressure in the choroid, there must necessarily ensue a fluctuation in the quantity of the filtration of the blood capillaries, since with a rise of fluid pressure a reduction of the filtration ensues, and

upon lowering of pressure an increase follows. Based upon the fundamental, although little known, experimental labors of Landmann and Körner, I could more fully theoretically develop the existing relations. In accordance therewith, an adaptive antagonism between the choroid and the filtration of the ciliary body is established. During the excess of the vitreous body pressure, the filtration of the choroidal capillaries must obviously become reduced, and consequently there ensues an automatic self limitation of the inflow of fluids. In consequence of the simultaneous closure of the zonula valve, the pressure in the posterior and anterior chambers drops along the descent of the current, and the filtration from the ciliary region must correspondingly increase. This condition is then reversed when during the overbalancing of the choroidal pressure the valve conditions become reversed. This arrangement with regard to the uniformity of the currents suggests a practical adaptation to purpose.

To further complete the similarity between the mechanism here considered and that of a suction and pressure pump we have in addition the accommodation apparatus.

The ciliary muscle, as tensor choroideæ, effects a compression of the vitreous body and a widening of the choroidal current channel: by means of the release of the zonula-lens system, a relaxation and widening of the zonula cleft is effected. There occurs simultaneously, by means of traction on the inner wall of the canal of Schlemm, adjacent to which is the origin of the muscle's tendon, a widening of the lumen of Schlemm's canal, whereby the filtration from the angle of the chamber is facilitated. Thus we have by the contraction of the ciliary muscle during accommodation the same current condition with the same valve positions as we have by the entrance of a wave of blood into the eye, viz., in the choroid. During the state of rest of the accommodation the opposite naturally prevails. The alternate contraction of the accommodation muscles act therefore in a similar sense as the contractions of the muscles of the body in general, viz., with a view of conserving the purpose of currents. From this there appears still more clearly the similarity with the suction and force pump of the heart muscles. Earlier in the critical review of the experimental researches on the intraocular fluid currents, we observed that in the current system of the lens

of the eye the principle of a suction and pressure pump also is applicable, by virtue of its relation to the accommodation. Thus the mechanical construction of the eye is a harmonious one. All parts are reciprocally conditioned and dovetail into each other, always with a view to a purpose, which purpose in case of the eye can be only the conservation of the function of vision of the retina and the optical apparatus.

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X.

A PIECE OF GLASS IN THE CRYSTALLINE LENS, WITH DESCRIPTION OF THE EYE THREE YEARS AND A HALF AFTER THE ACCIDENT.

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During the morning of November 28, 1908, a youth of sixteen years, while sitting at a table, was engaged in filling a two-ounce vial with the explosive caps taken from large paper torpedoes. He had filled the vial almost completely, and was pushing the last one in with a small stick, when he used a little more force than before; suddenly there was an explosion. He had the vial clasped in his left hand and held it just a little to the left of the median line of his face. He was thrown from his chair to the floor by the explosion and into a condition of partial insensibility for a few moments. When he was picked up, his left hand was found to be badly lacerated and his right slightly; particles of glass were driven into the flesh. It was also observed that there was a cut on the right side of the bridge of his nose not quite to the bone, about a quarter of an inch in length, and that his right eye was slightly bloody. As soon as he was able to take note of his surroundings he discovered that the vision of his right eye was blurred. Dr. Walter Gilday, of New York City, took charge of the patient's hands and he requested that I treat the eye. I saw the patient about 2 p. m. The lids were not injured in any respect, but there was a slight edema of the ciliary edge of the rght upper lid. On pulling the lids apart, I found the eyeball pink; there was a cut in the sclera about 2 to 3 mm. from the scleral margin, about 4 to 5 mm. in length, and slightly crescentic. The wound appeared to be made by a foreign body which had come from above and slightly inward. I judged this from the fact that the wound gaped in that direction, and that the anterior lip seemed to overlap

the posterior one. There was no iridodialysis. I was unable to examine the interior of the eye at that time on account of the hemorrhage.

I decided my duty was to have an X-ray picture taken immediately, and determine the existence or nonexistence of the foreign body in the eye, and laid the matter strongly before the mother. Her nervous system, however, had been so completely shattered by the accident that she refused to permit the boy to be taken out of the house in his then condition. I explained the immediate necessity of removing the prolapsed iris, to which she acceded, and that was done the same afternoon under general anesthesia at his home. The prolapsed iris was neatly excised, and I afterward thrust the forceps well into the lips of the wound in every direction in the hope of finding the piece of glass, but without success. I could not, however, bring myself to grope blindly into the vitreous humor and so desisted from further effort for fear of doing more injury. A few drops of a 1 per cent solution of atropin were instilled into the eye and a bandage applied. There was no subsequent pain, and in about forty-eight hours the blood had cleared away to such an extent from the anterior chamber that I was able to see that the lens was not dislocated, but that there was a dark smudge in the region of the wound in the vitreous behind the lens. The eye remained quiet for about a week, when a punctate inflammation appeared on the cornea which quickly proved itself to be a beginning mycotic keratitis. This was treated with the actual cautery and was stopped at once. Within a week several other points appeared in another region of the cornea and they likewise were immediately destroyed. After these there was no more. The corneal lip of the wound now commenced to get very gray and to buckle, and I began to feel certain that a foreign body was in the eye. I used argyrol, and finally the wound commenced to close; the corneal lip, however, remaining dirty gray. On January 5th, the eye having become quite white and the wound closed though still gray, I had an X-ray made by Dr. George Dixon, the chart of which is shown in Figure 1. The position of the foreign body appeared to be to the rear and inner side of the lens. A short time after the X-ray picture was taken, the eye became still quieter, and I examined it with the ophthalmoscope and oblique illumination. While I

could still see the dark smudge already referred to, it appeared to me that a foreign body was piercing the lens. The eye, however, remained quiet without any irritation, and finally, in February I allowed the patient to go to school, but directed him not to use his eye for near work. On January 1, 1909, his vision, with correction, was 20/40 minus; on February 23, 20/40; on March 11, 20/40 plus; and on April 7, it was 20/30. On April 23, 1912, three and one-half years afterwards, V. = 20/40, with correction. He was injured in November, 1908; the following October, 1909, about eleven months afterward, he went regularly to school and has been

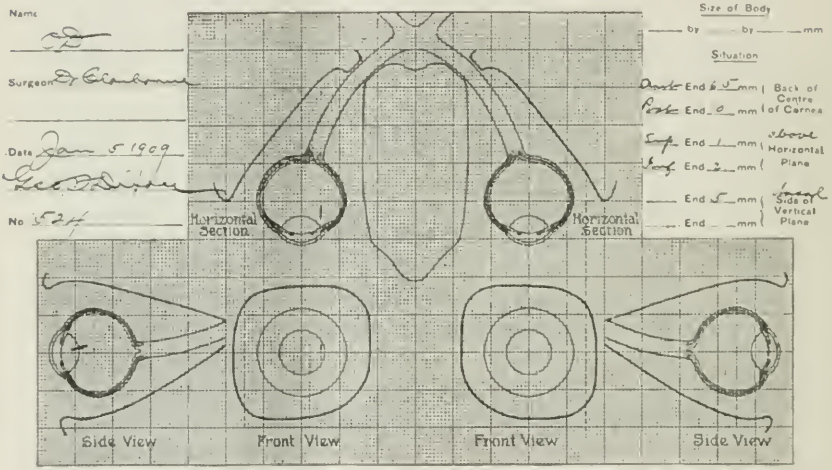

Fig. 1. X-ray localization chart of a piece of glass in the eye; one-half size.

using his eyes constantly since that time without any trouble.

Present Condition.—There is a scar on the inner side of the right cornea, slightly upward and inward, about 5 mm. in length, and 2 to 3 mm. in width, extending over into the sclera, more or less crescentic in shape. A small clean iridectomy inclines slightly upward and inward, pear-shaped, with the stem toward the periphery, with the columns of the coloboma practically in the same place. A grayish opacity of the lens, broad at the base and extending from the periphery outward and slightly forward, comes to a rounded point just short of the vertical meridian and a trifle above

the horizontal. The rounded point is encircled by a number of small points of opacifications, resembling very much a swarm of small insects. A few of these points likewise are between the base of the opacity and the end along the shaft of the projection. The opacity moves slightly against the movements of the eye, showing that it is more or less posterior to the equator of the lens.

It seems highly probable that the projection referred to is the piece of glass, and that the smudge at the periphery is caused by the changes made by the wound. There is no trace left on the cornea where the cautery was used. Looked at by transmitted light, of course, the opacities are dark, and the projecting shaft is darker than the rest; the base allows the reflex from the fundus to pass through at several points, while the haze around the head of the shaft appears very faint—this is possibly the explanation of the good vision. A reflex can be distinctly seen at the extreme periphery, linear in character, probably through the ligament of Zinn. It is likely that that structure is transparent, and this would be more or less consistent with the position of the wound in the sclera and the direction of the foreign body. The fundus of the eye is normal in every other respect, and while the pupil is pear-shaped, as stated, it is exceedingly small, and can scarcely be detected except on careful scrutiny.

It appears that there are a number of points of interest in connection with this case. First, the character of the accident. I have not been able to find any record of a similar case, though I have known one in which a steam engine gauge exploded and blew particles of glass into the eye without their having penetrated the interior. The caps contained in the torpedoes were enclosed in paper, and have considerable explosive force, and, when we reflect that the two-ounce vial was filled with these and all exploded at once, we recognize that the force of the explosion must have been considerable. This fact is demonstrated by the terrific laceration of his left hand and the depth to which the glass was blown beneath the surface of the skin. The majority of the pieces of glass were rather small, which is likewise evidence of the force of the explosion. In regard to the piece of glass which entered the eye, its size was estimated to some extent by Dr. Dixon; its length can be judged from the measurements between its two

ends The fact that the foreign body had not passed very far back into the eye, the fact that the position of the wound was slightly upward and inward, and that the length of the wound measured about the same as that of the foreign body, convince me that it entered the eye sideways on the rebound after it had struck the side of the nose, and that, after having entered, one of its ends turned and pierced the lens in a direction slightly forward and outward. It is impossible for it to have entered the eye directly, since the wound looked upward and inward and its anterior and lower lip overlapped and dovetailed the upper and posterior one. In addition, if it had entered directly, the force of the explosion must have driven it into the depth of the eye.

The patient was fortunate and unfortunate, and it was not as bad as it might have been. As a matter of course, there was a grave necessity for making an X-ray picture at once to determine the position of the foreign body, if it existed in the eye. If, however, this had been done, a certain amount of time would have been lost, and the condition as estimated by Dr. Dixon might have induced me to make bolder attempts at removing it. This would certainly have failed, in view of its position as now known. To have attempted to remove it after its position had been plotted would, in my opinion, have been bad surgery, as about six weeks had elapsed since the injury. It is fortunate that the mother refused to have the examination made, but the successful outcome of this particular case does not invalidate the advisability of immediate X-ray examination after foreign bodies have entered the eye, of whatever nature they may be.

The foreign bodies which enter into the interior of the eye are, as well known, steel and iron, stone, wood, glass, copper, brass, coal, and small shot. Steel and iron are by far the most common; and since the introduction of the X-ray into surgery the management of these cases has been much simplified and many eyes saved which would have been hopelessly lost. The creation of the great magnet of Haab and other magnets have rendered removal of these magnetic bodies possible, and have created an epoch in the surgery of the eye. Other bodies, if they are to be removed from the interior of the eye, must be first located by X-ray and removed by groping more or less blindly with forceps. In rare cases some have been located by

the ophthalmoscope, and removed through an incision in the sclera. I have known this done in the case of cysticercus in the vitreous. Since the introduction of breech-loading firearms we have ceased to meet with cases of copper in the interior of the eye except in rare cases. Perhaps one explanation of the fact that nonmagnetic bodies—for example, stone, glass, coal, and wood—remain in the anterior part of the eye, is the fact that such bodies are rarely thrown into the eye with great force. Accidents in which glass enters the eye are generally caused by fracture of eyeglasses, from a blow from some hard substance, such as a ball or stick. I have known of several such cases which, however, were not in my practice. I believe that accidents from brass are exceedingly infrequent.

I have known of one case of a bird shot which entered the eye beyond the ciliary region and remained apparently encysted in the fundus for fifteen years without producing any active inflammation. The patient's eye was always sensitive to light and use, and he was compelled to wear dark glasses in daylight. He has since passed from under my observation, but I examined his eye for fifteen years from time to time.

It would appear from this case and others that shot became encysted and gave little trouble. It is worthy of remark also that in this case there was no other change whatever in the eye.

The general opinion exists that injuries from copper have a bad prognosis. There seems to be little doubt that certain chemical changes are produced in the tissue of the eye by the residence of copper, and Leber has attempted to show that this metal is apt to cause suppuration even without the introduction of pus-forming bacteria, if the metal is located in the vascular portions of the eye; when in the nonvascular portion it is borne well. A number of authorities agree that copper is borne well in the anterior part of the eye. In general, glass, stone, coal, and wood do not produce chemical changes. Laying aside the question of chemical change, it may be said that the toleration of foreign bodies in the eye depends upon whether they carry infectious germs with them in their entrance. It would seem that stone, glass, coal, and wood are most likely to carry infectious germs, since they rarely enter in a condition of heat.

Fuchs maintains the prognosis must be stated to be absolutely unfavorable when the foreign body has been left in the eye.

The position of entrance is not considered to be a matter of such great importance now as in former times, and I think the general impression exists today that the ciliary region has not so many terrors for us as it formerly had. Certainly a sterile foreign body or sterile knife may be passed through the ciliary region without producing iridocyclitis. Nevertheless, the prognosis in general is better in those cases in which the ciliary region is not the point of entrance. In the case which I have just described the glass passed through the ciliary region, and it must have been very hot from the explosion; yet it touched the skin in all probability before it entered. If this was the case, it probably remained hot enough not to be infected, as no intraocular infection occurred afterward. The infection of the cornea and lips of the wound which occurred a week after the accident, I believe was due to other causes, as the patient remained in a room heavily upholstered. I believe the grayness of the lips of the wound was caused by the same microbe which infected the cornea.

The prognosis when foreign bodies remain in the lens is better than when they remain in other parts of the eye, and the same necessity for immediate operation does not exist; but foreign bodies in the lens, as a rule, in time produce complete cataract, and in several instances have been removed later along with the lens.

Doyne has reported a case of foreign body in the lens which entered the eye in childhood and remained for thirty years. Later the patient served in the English army and was a good shot.

Lewis has reported a case of steel in the lens which remained for six years with normal vision.

Bruner has reported a case of removal of a piece of steel from the lens by magnet without an increase in the opacity.

Knapp removed a piece of steel from the lens by magnet, though the eye was lost finally by panophthalmitis.

The numerous points of opacifications around the shaft and head of the foreign body in my case have appeared since I last saw him two years ago, and I believe are the forerunners of a complete cataract. It is interesting, however, to observe that his sight remains the same under correction, and that he has been able to use his accommodation for near work without any discomfort. This fact also favors the view originally held by

me that the foreign body had not touched or destroyed the ligament of Zinn.

The points of interest in this case may be summed up shortly: A youth of sixteen received a wound in the eyeball through an explosion; a small spicula of glass about 3 to 4 mm. in length entered through the ciliary region, apparently just to the rear of the ligament of Zinn; the iris was prolapsed and the prolapse was cut off. The eye became quiet at the end of about a month; after twelve months of rest the patient commenced to use his eyes at school in the ordinary way, and throughout the whole length of time the vision ranged, under correction, between 20/30 and 20/40; the latter being the vision at this date. The eye is scarcely deformed at all; pupil is black, coloboma visible only under close inspection, and the patient has used his eye without any discomfort for two and a half years.

Slight increase in opacification of the lens has occurred. The question arises: what is the future of that eye? I believe ultimate complete opacification of the lens.

XI.

EARLY FUNDUS SIGNS OF ARTERIOSCLEROSIS.

ALLEN GREENWOOD, M. D.,

BOSTON.

It is my intention to make this paper a brief one, as I have not thought it wise to burden you with a lot of statistics or the recounting of a number of clinical cases, but simply give you as well as I can the results of my personal observations as to the early fundus changes and symptoms of beginning arteriosclerosis with their significance, and the possible advantages to the patient of this early discovery and treatment of arteriosclerosis.

It is unnecessary to enter into a discussion of all the causes of this condition, or whether arteriosclerosis is the cause of chronic interstitial nephritis or the reverse, as this phase of the subject has so recently and in such a thorough manner, been covered by Dr. Bulson in his paper at the recent meeting of the ophthalmological section of the American Medical Association. I feel we are all greatly indebted to Dr. Bulson for many helpful suggestions.

The medical profession is becoming more and more keenly alive to the importance of the early treatment of arteriosclerosis, and is beginning to look to the ophthalmologist for help in the early diagnosis. We are all only too familiar with the fundus signs of advanced arteriosclerosis and cardiorenal disease, with the white, irregular vessels, often with entire obliteration of smaller branches, with pressure on the veins sufficient at times to produce thrombosis, with accompanying retinal hemorrhages and exudates, and we also know that even in this advanced stage it is possible for good treatment to materially lengthen life and reduce the danger of the imminent apoplexy or uremia, which the fundus condition indicates.

During the past few years I have observed from time to time a number of cases showing the early signs of arteriosclerosis

soon to be described, and have seen those signs steadily increase until the fundus pictures were those of advanced arterial disease; and it has also been my privilege to follow an increasing number of cases showing the early signs associated with moderately increased blood pressure, where from year to year there has been no advance in the extensiveness of the fundus signs, and in a few cases some of the early signs have disappeared wholly or in part. The results of treatment have therefore certainly been very encouraging to me, and have led me to be more persistent in my efforts not to overlook the early signs of arterial disease and to see that appropriate treatment and rules of hygiene are carried out.

Of the subjective symptoms of beginning arteriosclerosis of the retinal arteries, there is not much to be said, as they are few in number and more frequently not present at all, so that the early fundus signs are discovered in the ordinary routine ophthalmoscopic fundus examination of patients who come to us for their first presbyopic glasses, or patients who come for various disturbances due to errors of refraction. The patient may complain of a slight dimness of vision of one or both eyes, or of an inability to use the eyes with comfort as long as customary. The most characteristic symptom of these patients who are at middle life or beyond, is the complaint that the middle letter of a word is blurred, irregular in outline, slightly misplaced, or sometimes momentarily absent. On careful testing of the field of vision in such cases there is found a partial central scotoma, and that this symptom and its underlying cause is more frequent than is generally supposed, is my belief. Such a patient can often read the letters of the 20/20 line, but complains of a slight irregularity in the line or in some letters in the line, this being an entirely different irregularity from that one gets from an astigmatism. A few may complain of periods of lost vision in one eye, due to spasm of a diseased central vessel irritated by the toxins in the blood stream, and here treatment is necessary not only to prevent advancing vascular disease, but to prevent permanent closure of the central vessel with blindness and a picture of embolism.

To the very early fundus changes of beginning arteriosclerosis I wish particularly to draw your attention, and these will vary according to whether the main sclerotic change is in the larger vessels or the finer twigs, or in both, also somewhat depending on the condition of the choroidal vessels.

One of the earliest signs of beginning sclerosis in the larger retinal arteries is the bending of the veins where the arteries cross, this being especially the case in the lower periphery where the secondary and tertiary branches may cross and bend the veins beneath them, but I wish, however, in this connection to impress it upon you, that in addition to the bending of the veins there should also be evidence of a slight dilatation of the vein on the distal side of the crossing, showing slight compression and also some loss of arterial translucency, as shown by the inability to see the underlying vein as it should be seen in the normal condition, and also a broadening of the light reflex on the artery.

We frequently find even in young children a slight normal dipping down of the vein where the artery crosses, and even in older people this may be observed where there are no other evidence of arterial disease, so that in order to make this appearance diagnostic it seems to me that it is necessary to show the additional signs of compression and loss of translucency mentioned above, and in cases where I have made a diagnosis of beginning arteriosclerosis in its very early stages, where this bending was the principal sign, there has always been these slight evidences of compression and loss of translucency, and the examination with the sphygmomanometer has usually shown an increase of the blood pressure.

An equally early sign of arterial disease, but shown in the smaller vessels, is the presence, as described by de Schweinitz, of corkscrew vessels near the macula, often accompanied by a few macula dots. I, however, frequently see people in middle life with somewhat reduced central vision not improved by proper glasses, where the ophthalmoscope shows no tortuous vessels and nothing definite to be seen in the macula, though often the macula may have a slightly hazy appearance, or perhaps better, a slightly filmy appearance, and I have come to consider such patients as probably victims of beginning vessel disease, and have found that a moderately increased blood pressure has seemed to bear out the diagnosis. In this same class of cases there is often seen a slightly congested appearance of the optic disc, it being more of a red color than normal, and often many more visible capillary vessels than usual can be made out. The edge of the disc, with its surrounding retina, also shows the filmy appearance mentioned above. This

filmy appearance may occur also along the course of the vessels and in various parts of the fundus as a gray haze due to edema of the retina, and later these areas may show spots of degeneration.

Another early sign of vessel disease in the fundus is the presence of few or many, somewhat indistinct, yellowish-white spots of chorioretinal disturbance, seen most frequently and abundantly downward, the other signs of arterial disease often being absent, but the blood pressure raised. These are the cases in which it would appear that the choroidal vessels are most involved.

Another associated condition that I have been surprised at the frequency of has been a very slight hollowing of the optic disc, not amounting to a cupping, but with the vessels taking on the merest sloping tip from the edge toward the center. Some of these cases in after years have developed signs of glaucoma, and others have not. The cases showing this condition have no loss in the visual fields or increased tension, but other signs or arteriosclerosis with increased blood pressure are usually present to convince us more and more of the intimate association between arteriosclerosis and some forms of glaucoma.

In the few cases where there is a history suggesting spasm and the patient seen during an attack, it may be possible to observe small, nearly empty arteries which fill up and dilate while under the observer's eye. A classical fundus picture of embolism of the central artery may therefore be more suggestive of a beginning arteriosclerosis than central embolism. In a case seen recently by the writer where the fundus picture was that of central embolus, other signs of vessel degeneration were present, with an increased blood pressure that seemed to establish a diagnosis of obstructive arterial disease calling for careful general treatment.

In slightly more advanced conditions the arteries show a more markedly increased light reflex, and often with grayish-white filmy bands along their edges, so that where they cross the veins the latter are hidden for a greater distance each side of the artery than the simple size of the artery.

The veins themselves often show signs of sclerosis, evidenced by changes in caliber and course, with appearances of sluggishness of the venous flow, and often with white streaks along

their sides. Sometimes the veins are enormously dilated and tortuous, and in more advanced conditions show hemorrhages and evidences of areas of thrombosis.

The still later and more advanced signs of arteriosclerosis this paper is not materially concerned with, such as the marked whitening of the arteries, often with complete obliteration, distorted veins, often with thrombosis and exudates, with frequently the star shaped exudates around the maculæ, which gives us a picture indistinguishable from that of albuminuric retinitis, though even in this late stage some cases may show absence of albumin in the urine, though one may be sure that sooner or later the signs of advanced kidney disease will appear if the patient does not succumb to a cerebral hemorrhage before.

Presbyopes or hypermetropes, and those showing early presbyopia between the ages of 40 and 60, are those in whom the early signs of arteriosclerosis are mostly found; particularly is this true of men who have been leading active business lives. These patients come for a presbyopic glass only, and it is very easy to overlook fine fundus changes in the ordinary routine examination of such cases.

It is needless perhaps to suggest that for the observation of the very earliest signs of sclerosis of the retinal vessels, the upright image, a good light and much patience, and frequently a dilated pupil, are necessary. On finding one of these early signs the sphygmomanometer must be used and the blood pressure determined, and it has been my experience that in all such cases a more or less marked increase is found, but in this connection I wish to call attention to the fact that the amount and severity of the fundus change is no criterion as to what the blood pressure may be, for the vessel sclerosis in the eye may be less than that in other parts of the body, or vice versa, though usually they bear a pretty close relation to each other. I have found, however, in a few cases, only a moderate increase of blood pressure where the fundus lesions were considerable, and a very high degree of blood pressure where the fundus changes were slight.

I recently had a woman of 55, who came to me for a change of glasses, who showed a very moderate amount of sclerosis of the larger vessels, as evidenced by loss of translucency and bleeding, and compression of the veins. A measure of the

blood pressure showed on repeated trials 260 mm. of mercury. Immediate steps were taken by her family physician, and in less than two weeks the blood pressure had fallen to 200, and since then they steadily decreased. What might have happened to this patient if no examination of the fundus had been made at the time of her visit I do not know, but she was certainly, from the statements made to me by her family physician afterward, in a serious condition likely to result in a cerebral apoplexy.

If the theory of the toxic cause of arteriosclerosis and the chronic arteriosclerotic kidney be correct, and most of the evidence points that way, it must be evident that the earlier a diagnosis is made and the proper remedies applied to prevent fresh formation of toxin, the better for the patient. In common with Dr. Bulson, I have seen some of the early fundus signs described above disappear under a treatment which lowered the blood pressure and regulated the body metabolism, though in the majority of cases the most that can be expected is a staying in the progress of the disease, or a lessening of the rapidity of its progress, and that this can be accomplished to a greater or less degree has certainly been borne out by my experience.

The treatment in this condition consists largely in immediate thorough evacuation of the bowels, followed by a careful regulation of the intestinal tract, the use of nitroglycerin, or some of the remedies used by the internist for the reduction of the excessive blood pressure, and then a careful regulation of the patient's habits, diet and general bodily functions. Small doses of the iodids may be helpful, and in some of my patients the use of buttermilk or some of the preparations of lactobacilline have seemed helpful.

Whether an early arteriosclerosis that is shown to be present by fundus signs and increased blood pressure will take on the more rapidly fatal kidney form or not, cannot usually be foretold at the early stage; though one may expect that the disease will follow the kidney type if the predominating fundus signs are those of retinal edema and macular degenerations. This, of course, is especially so if the urinary examination points to the same conclusion. In either case careful treatment is imperative, but more so in the kidney type of cases.

From the foregoing it must be evident to all that upon the

ophthalmologist there devolves a distinct duty in regard to the routine fundus examination of all patients who come before him. This, of course, requires a considerable degree of time, with careful and conscientious examination of all fundus details in every case, but it is certainly time well spent, and will undoubtedly lead, in many cases, to the prolonging of life and the prevention of early apoplexies and uremic poisonings. That the general practitioner is cognizant of this possible help from the ophthalmologist is evidenced by the fact that many of them are now sending patients with moderately increased blood pressure to the ophthalmologist for a report of the fundus conditions.

How great a field in the future practice of medicine arteriosclerosis will occupy, only time will tell, but in view of our knowledge of the early eye and kidney changes, may we not expect to find an increasing interest as to the effect of arteriosclerosis on other organs, particularly the ear, as witnessed by the writings of Walker and others, even though their arterial system be not strictly analogous.

XII.

SOME NOTES OF VISUAL DISTURBANCES DUE TO DISEASES OF THE NASAL ACCESSORY CAVITIES.

H. Moulton, M. D.,

Fort Smith.

There has been already so much of value published concerning the effects of diseases of the nasal accessory sinuses upon the eye that there is no longer much disposition among ophthalmologists to doubt the relationship.

In many cases the relationship is obvious, but in many cases it must be laboriously sought.

One who has had a busy practice extending over many years is likely to have had some of these cases thrust upon his notice, whether he has been searching for them or not. In the future he will see many more, because he will be looking for them.

It is quite desirable in this work that the ophthalmologist be familiar with the methods of examining the nose, and with the diagnosis of diseases of the accessory cavities, whether he habitually calls the rhinologist to his aid or not. In no other way can he do the best work.

Cases requiring an investigation of the condition of the sinuses are:

1. Asthenopia without other adequate explanation, and unrelieved by the usual treatment of the eye.

2. Defects of vision referable to lesions of the optic nerve, especially retrobulbar lesions with central and paracentral scotomata.

3. Orbital diseases, especially abscess and tumors in the nasal side of the orbit, and possibly palsies of the extraocular muscles.

4. Possibly also some intraocular lesions, as of the uvea or other structures, which might depend on disturbances of the intraocular blood supply or on socalled endogenous infection.

It is not the purpose of this paper to dwell at length on the manner in which sinus diseases produce those ocular lesions,

Dr. Wendell Reber, in these ANNALS for January, 1912, has ably discussed this part of the subject as it applies to categories 2 and 3. Kuhnt, Birsch-Hirshfield, Onodi and others have contributed the results of their valuable researches. Some of the latest text books (de Schweinitz) have given proper emphasis to this subject.

The purpose of this paper is to call attention to the subject by a few illustrative cases:

Case 1.—Illustrating in the person of a young girl asthenopia of a type likely to be overlooked unless the surgeon were on his guard.

Katherine G., aged 14, a bright, studious school girl with a history of good general health, was brought on September 26, 1911, for an eye examination. Her father stated that during the preceding summer she was troubled much with headache and a blurring of near vision. On beginning school in the early fall she found it difficult to keep up her work on account of headache, which was now increased, of nearly daily occurrence, and seemed aggravated by study. The headaches were worse in the morning and radiated over the brow and vortex on the right side. Her temperature was 101° F. at the time of the examination, and she seemed ill, though well nourished. There was only one diopter hypermetropia in right and left eye, with vision 20/16.

Glasses were not prescribed, but she was referred to her family physician. At the end of about a week she returned unimproved. Her physician stated that he had given her full doses of quinin, on the supposition that her illness was due to malaria. She still had the headaches, although she had given up the use of her eyes, and she still had a daily rise of temperature. At this time attention was directed to the nose by the statement that she had bad "colds in the head" much more frequently than other members of the family. There was in the right nostril a little pus coming from under the anterior end of the middle turbinate. The middle turbinate was enlarged and in contact with both the septum and outer walls of the nose. Glasses at the parents' request and a spray of adrenalin chlorid were now prescribed, no improvement following. On October 14, under local anesthesia, the anterior half of the middle turbinate was cut away and the anterior ethmoid cells were opened. These being found full of pus and granulations,

were freely curetted. The result was complete relief of all the symptoms, which has lasted to the present time. This case has made me think that perhaps many chilren are vainly wearing glasses, whose sinus disease has been neglected, for we do not often examine the sinuses of these young people.

Case 2.—Also illustrates asthenopia due to ethmoiditis. Miss D. J., aged 25 years, had a mild form of atropic rhinitis. In 1907 I removed the anterior end of the right middle turbinate because of granulations springing up between it and the outer wall of the nose, and because of a persistent and slight flow of pus from this region. For some years before this and afterward until the operation she had persistent headaches and asthenopia, worse on the right side. She had myopic astigmatism of 0.25 D., ax. 90° each eye under a mydriatic. Vision 20/20.

Glasses gave no relief. Her headache was not constant but nearly so. Every few weeks it was so severe as to incapacitate her for work, that of a dentist's assistant. Transillumination showed the right frontal sinus sometimes bright, sometimes dull. There was always a little mucopus coming from the region of the nasofrontal duct in the nose. Pain was made worse in stooping. The use of the eyes was intolerable much of the time. The fact that on several occasions a few weeks in the country with rest of the eyes gave much relief from the symptoms of asthenopia, magnified the importance of eye strain as a causative factor and excited renewed energy on my part in searching for further defects in refraction, accommodation, or muscular adjustment, but in vain. Some of the anterior ethmoid cells were now opened without relief. The frontal sinus could not be probed.

The radical Killian operation was performed on February 16, 1911. There was only mucus in the frontal sinus, but the nasofrontal duct was small if not obliterated. A free passage was made into the nose. The ethmoid cells, some of which were necrotic and full of pus, were all thoroughly broken down and a small curette passed into the sphenoidal sinus. Recovery was prompt and without deformity. Headache has permanently ceased, and, best of all, the asthenopia has passed away. The patient is now employed as a secretary, using her eyes much more freely than in her former position.

Case 3.—Illustrating diseases of the optic nerve due to sinus

diseases. Mr. E. H., aged 20 years, son of physician, called me to see him about eighteen years ago on account of partial blindness of his left eye accompanied by severe headaches. My notes of this case have been lost, so only the outline can be given. The headache was occipital and of an intense type. The blindness of the left eye involved only a portion of the field, there being a large central scotoma extending nearly to the temporal periphery. At the end of four or five days after the onset a profuse discharge of pus from the left nostril was followed by gradual and complete restoration of vision and relief of pain.

Case 4.—Was one of displacement of the eyeball and obstruction of the retinal circulation due to mucocele of the frontal and ethmoid sinus.

Mrs. J. J. L., aged 25 years, came February 24, 1911, because of "watering" of the left eye and a swelling at the inner canthus which she thought was a swelling of the lacrimal sac. Examination showed a soft painless tumor on the inner wall of the orbit. The eyeball was displaced outward 5 mm., and forward 3 or 4 mm. Vision, right eye, 20/20; left eye, 20/40. The fundus of the left eye showed arteries and veins much larger in caliber than those of the right. During the next year the patient remained under observation, taking large doses of the iodids much of the time. The tumor slowly grew in size. The displacement of the eyeball increased. The retinal veins became more enlarged and vision fell to 20/100. Pain was absent. No abnormal condition was observed in the nose.

On May 14, 1911, a radical operation was done, the incision being made in the manner recommended by Dr. Arnold Knapp, along the lower border of the eyebrow and carried down onto the nose, exposing the entire upper and inner walls of the orbit. A dehiscence was found in the bone which led into both the frontal sinus and anterior ethmoid cells. Almost all of the os planum had been absorbed. The frontal sinus was filled with a white gelatinous mass which was removed. The anterior and middle ethmoid cells were filled with a fluid pus, the posterior ethmoid cells with nearly pure pus of a dark gray color. Healing was normal without apparent external deformity. The eyeball resumed its normal position and movements. On June 6th vision was 20/50, with No. 1.50 sph. 20/30. Fundus normal, no scotoma.

Case 5.—Mr. L. H., aged 17 years, came December 9, 1909. His right eyelid was red and edematous. The right lacrimal bone was pushed forward and outward. He had marked exophoria, but normal eyes in other respects, and normal vision Breathing through the nose was obstructed by a firm red tumor appearing in the upper part of each nostril.

These symptoms had been developing for some years. A double radical Killian operation was done on February 16th, disclosing a sarcoma, which had destroyed the ethmoids in each side and eroded the septum so that after the mass had been all removed a finger was passed from one orbit into the other. Recovery was good and to date there is no recurrence. This case was by no means one of obscurity, but well illustrates nevertheless how orbital diseases may originate in the sinuses. The pathology of this case was established with the microscope by Dr. E. G. Epler.

XIII.

DEATH AFTER CATARACT OPERATION.

EDWARD J. BERNSTEIN, M. D.,

KALAMAZOO.

We are more than justified in the expectation that cataract operation will not likely end in death. Indeed, until I had my experience and elicited the information herein contained, it seemed to me something unheard of and undreamt of. The full history I shall give in connection with reports of forty-eight deaths in the practice of oculists in this country and abroad. At this point I merely wish to outline the case:

A physician of 76, apparently in good health, kidneys, heart and lungs sound—not neurotic—was operated on by me for a mature nuclear cataract. The operation was without incident other than catching a piece of the iris on the Graefe knife, iridectomy was done and no blood lost. Patient was put to bed, eye bandaged for two days and the operated eye for eight days. Was allowed to sit up on second day for a short while; on the eighth day was permitted to go about his room. On the twelfth day indefinite pains in shoulder developed which yielded promptly to small doses of aspirin. No sign of glaucoma. From this time on, at short intervals, he had other attacks of pain in the sciatic, in the musculospiral region, in various joints—without swelling or redness. The pains at first readily yielded to small doses of aspirin, then morphin, in increasing doses, was needed—finally, one month after operation, he was well enough to go about his room for six days, when the pains returned, and, with it, he became quite demented; this condition persisted for another fortnight, and although the eye looked good and his vision had returned, still, as his mania was on the increase and his pains persisting, I removed the eye, on the advice of both his sons—who are medical men—and the consulting alienist and internist, in the hope that we were in some way getting rid of the offending cause. In spite of this, however, there was no remission of the symptoms, and

two months after the primary operation the patient died, presumably from exhaustion. He was quite maniacal at the time of death. Section of the eye after removal showed nothing pathologic, other than ordinary results of iridectomy-cataract operation.

I have sent reports of this case to a large number of well-known oculists in this country and abroad, and asked for similar histories. I have collected forty-six cases in whom death from one cause or another supervened on cataract operation, some of them after hypostatic pneumonia, which is neither surprising nor uncommon, when we see that most of the patients were below par and permitted to lie on the flat of the back for prolonged periods. Some of the cases were in diabetics, and it is not surprising to find a slight extra insult to the economy cause death. The unexplicable is, that apparently perfect patients with cataracts should die and with no pathologic signs apparent.

The experience of operators differs widely; some, as Professor Haab, who writes to me, that in over 2,000 cases he has had no death. Edmund Landolt concurs in this experience, while on the other hand Professor Fuchs writes: "Dass sehr alte Leute nach cataract Operationen sterben, ist *nicht* ungewöhnlich, aber die Ursachen des Todes sind in den einzelnen Fallen so verschieden, dass eine zusammenfassende Erklärung diesser Fälle nicht statthaft ist." E. Treacher Collins had none, except in cases of diabetes. Professor v. Hippel, in giving me the history of three cases of death which he had seen after cataract operation, says: "Ihr Fall erscheint mir nicht besonders merkwurdig, der Patient hat wohl irgend eine allgemein Infection gehabt, dass dieselbe in einem ursachliche Zusammenhang mit der Operation ist ganz zweifelhaft. Für wahrscheinlich wurde es mir aussehn, wen Sie den alten Herrn zu lange im Bett liegen lassen—which was not the case here: patient sat up in bed on second day and in chair on third day —eine besonderes Interesse konnte, nach meiner Meinung nur ein Fall beanspruchen, in welchem sich nachwiessen liesse, dass von Auge infolge der Staroperation eine todliche allgemein Infection des Körpers ausgegandgen ist." which also seems not to be the case in this patient.

We are all familiar with acute mania following cataract operation, and a great many of my correspondents gave a number of such experiences, some of which ended in death from ex-

haustion—apparently. And in some it led the patients to take their lives by some deed of violence. I have included in my list of deaths, several such, and they are included because they seem to lend an air of possibility to a theory I entertain. Dr. Posey had collected twenty-four such, and in the Wills Hospital, out of 779 cases of cataract extraction, mental disturbance occurred in sixteen, or 2 6-7 per cent. Changes of habit and surroundings is supposed to be the cause, and in support of this, Dr. Emory Hill quotes Löwy as saying that in Schnabel's clinic at Innsbruck, the proportion of mental disturbances following cataract operation was much larger than in the Vienna hospitals, owing to the fact that in the former the patients were mountaineers, accustomed to a rugged free life, whereas in the latter the patients were from the city of Vienna and hospital life offered less change from their routine.

We have been taught to believe that these cases of mania were due to retention of the bandage too long on the nonoperated eye, and that removing it will promptly stop the outbreak. In my case the eye was not bandaged after the eighth day and the unoperated eye not after the second day, and the mania came on weeks after. It seems to me that Dr. Wendell Reber comes pretty near the truth when he writes me as follows: "In my opinion the bandage business is very badly overdone. Cataract patients, being mostly old people, are naturally more apprehensive than usual about operations, and when it concerns anything so vital as the sight, they are naturally in a state of low grade mental excitement. For some years I have taught my assistants that that technic which presents the least possible departure from the ordinary everyday life of these people is likely to produce the largest number of successes. . . . It is the easiest thing in the world to produce either marked mental excitement or a calm and philosophic assurance in these people." I quote this letter fully as it fits in with my theory, and that is that mania and death are the results of fear, the latter being but a state farther in the pathologic changes occurring in the brains of the patients, bringing about such a lowered state of vitality that they succumb to operation which is not, or should never be, attended by fatalities. This untoward accident may occur before as well as after operation. Dr. Sydney Stephenson's case seems one in point. He writes: "I count myself in luck that I have had no such fatalities as you record to report. My nearest was an old lady who died suddenly the

night previous to the day fixed for operation of cataract."

It has been very difficult to make a very good classification of these case reports. They were in the practice of the following gentlemen, to whom I am very much indebted:

W. H. Post, 1; H. P. Calhoun, 2; Dr. Calhoun, Sr., 2; W. Zentmayer, 1; C. F. Rider, 1; David Webster, 3 and a fourth which terminated in apoplexy a year later following similar attack night after operation; F. Park Lewis, 1; Jas. A. Spalding, 2; N. M. Black, 1; Dr. Salva, Grenoble, France, 2; P. A. Callan, 1; E. E. Holt, 2; J. E. Weeks, 1; W. H. Carmalt, 2; Adolph Alt, 2; Herman Knapp, 2 (reported by Drs. Alt and Chas. May); F. C. Todd, 1; Wendell Reber, 1 and report of another in Dr. Hartridge's practice; Dunbar Roy, 1; Webster Fox, 2; S. C. Ayres, 1, H. F. Hansell, 1; W. C. Posey, 1; C. D. Westcott, 1; von Hippel, 3; G. deSchweinitz, 3; H. D. Noyes, 1; S. O. Risley, 2; Keiper, 1; Dean, 1. Treacher Collins had seen deaths in diabetes, number not stated, and Fuchs thought they were not uncommon in the aged. In nearly all the cases the eye was recovering and seemed not offending. As nearly as I can tabulate them, they were as follows: Cases in which no cause of death is given: Spalding, 2, one on sixteenth, day, other on nineteenth day; Noyes, 1 on fifth day; Keiper, 1; Dean, 1; H. Knapp, 2; Post, 1 (stomach trouble); H. P. Calhoun, 2, one immediately on being put to bed, other ten days; Dr. Calhoun, Sr., 2, time unknown; Zentmayer, 1 (soon?). Heart lesion: Callan, 1; Carmalt, 1 (mitral insufficiency). Meningitis: Webster, 1, in a few days. Appendicitis: Spalding, 1. Dementia coming on after operation and from which patient did not recover: deSchweinitz, 1, in twenty-four hours; Roy, 1 (two months); Hansell, 1 (eighteen days); Posey, 1 (sixteen days); Westcott, mania then suicide on tenth day; Holt, 2 (one on third day, other one week); C. F. Rider, 1 (one month); Park Lewis (months after, but attack began shortly after operation); Black, 1 (seven or eight days); Bernstein, 1 (two months, attack one month after operation). Nephritis: David Webster, 1. Diabetes: Weeks: 1 (nineteen days); Carmalt, 1; Alt, 2; Webster, 1. E. Treacher Collins has seen deaths in diabetics, number not given. Died on table or shortly after: Hartridge (immediately), 1. Dr. Callan reports two within an hour (practice of colleagues). Died day before: Sydney Stephenson, 1. Arteriosclerosis and apoplexia cerebralis: von Hippel, 1; Dr. Salva (Grenoble, France), 2;

David Webster, 1 (patient had attack night following operation, died year later of apoplexia; Webster Fox, 2; case of Hartridge and possibly the two cases reported by Callan and one of H. P. Calhoun. Pyelonephritis: deSchweinitz, 1. Hypostatic pneumonia: Ayres, 1 (complicated with delirium tremens); von Hippel's report of two while assistant; Todd, 1; Webster, 1; S. O. Risley, 2.

The phenomenon of fear may possibly explain the deaths in these operations attributed to apoplexia cerebralis, especially when the patients have arteriosclerosis and high arterial tension, for it is shown by Cannon that fear causes an increased amount of adrenalin in the blood, and Fraenkel has shown the same thing in Graves' disease; in both we have tremors, rising temperature, increased heart beat, muscular weakness, digestive disturbances, impaired nervous control, hypersusceptibility to stimuli, and in protracted intense fear we have marked physical degeneration.

In an elaborate series of experiments, in his effort to show the relation of fear to the mortality from operating for Graves' disease, Dr. Geo. W. Crile has shown the actual pathologic changes in the nervous system of animals subjected to great fear. He has had rabbits badly frightened and though not touched by the object feared, on making sections of the brain, medulla and spinal cord immediately after the phenomenon, has been able to show marked changes in chromatin bodies in the Purkinje cells. His sections all demonstrate several important points, viz., that cerebral stimulation by fear causes, first, demonstrable morphologic changes in brain cells; second, a marked early increase in the number of active (and hence also hyperchromatic) cells, and third, that this stimulation is followed by later and more serious morphologic changes in the cells, which do not attain a maximum till from two and one-half to six hours have elapsed after the period of fright. Under the influence of fear, he says, most, perhaps all, of the organs of the body are divided sharply into two classes: first, those that are stimulated, and second, those that are inhibited. Those that are stimulated are the entire muscular system, vasomotor and locomotor systems, the sense of perception, the respiration, the mechanism for erecting the hair, the sweat glands, the thyroid, adrenal and the special senses. On the other hand, the entire digestive and procreative functions are inhibited.

The increased action of the thyroid gland causes an increased metabolic activity; there is evidence that glycogen is actively called out, it being the most immediately available substance for the production of energy; increased activity of respiration and sweat glands are needed to supply the greater requirements for oxygen and the elimination of increased waste products. He shows that repression of these activities in the presence of fear are more dangerous than activity. We may say that fear is the phylogenetic fight or flight—again quoting Crile. On this hypothesis all the organs and parts of the entire animal are integrated, connected up or correlated, for self-preservation by activity of the motor mechanism. We fear not in our hearts alone, not in our brains alone, not in our viscera alone; fear influences every organ and tissue. In thus concentrating all or most of the nerve force on nerve muscular mechanism for defense alone a greater physical force is developed. Then, too, for the same reason, the exhaustion following fear will be the greater, as the powerful stimulus of fear drains the cup of nervous energy, though no visible action may result. Although there is not convincing proof, yet there is evidence that the effect of the stimulus of fear on the body without physical activity is more injurious than actual physical contest which results only in fatigue, without gross physical injury. An unexpressed slumbering emotion is measurably relieved by action, and it is probable that the various energizing substances needful in combat, such as the thyroid and adrenal secretions, but which are not consumed in action, may, if frequently repeated, cause physical injury to the body.

The agency that inspires sufficiently the faith—whether the agency be mystical, human or divine—whatever dispels worry, will at once stop the body-wide stimulations and inhibitions which cause lesions as truly physical as fractures. The remedy is to make patients see that worry and fear will damage the body and realize that tranquillity and philosophic resignation to the extent of that faith, will banish fear and its baneful results. It should be our duty to reassure our patients to the fullest extent—even stretching the truth for their benefit—to allay irritation and noise, fussing of attendants, all excitement, and by such drugs as will depress the associational powers of the brain, minimize the evidence that inspires fear. For psychic shock is as injurious as traumatic shock.

A CASE OF DEATH AFTER MINOR OPERATION.

Bearing upon the subject of death following minor operations in the eye, I want to relate the following as another instance in which I failed to adhere to the results of my past experience not to operate upon old people till they had been in the hospital a day or two and accustomed themselves to their surroundings, and not to allow considerations of cost to them to influence me away from that lesson.

December 4, 1912, I saw Mrs. W., aged 78, suffering with a dacryocystitis, the result of a false passage made in the attempt of an "eye specialist" (one of the six weeks' variety) to pass a lacrimal sound. I had her under my care for two years, trying to convince her that nothing short of a radical enucleation of the sac would be of any permanent avail. This advice she resisted, in spite of frequent swelling of sac with pus, which was only temporarily helped by incising through the canaliculus opening I had made. Finally she agreed that there was no other way out, as she was having temperature and great pain. On account of her financial difficulties, I agreed that she might postpone going to the hospital till the morning of the operation. On account of her dread of anesthesia and her heart lesion (a mitral insufficiency with no compensation, the first sound was almost absent), it was agreed that she should be operated on with morphin-scopolamin injection.

Accordingly, shortly after her arrival at the hospital, she was given 1/6 grain morphia with 1/100 scopolamin, and in an hour afterwards a second injection of like amount. When I arrived at the hospital she was apparently sound asleep. A radical enucleation of the sac according to Meller was done. She seemed to be sleeping perfectly quietly, and no idea of anything untoward was indicated by pulse or otherwise. Bacterial examination of sac contents revealed staphylococcus albus and aureus and streptococci. Operation was done at 8:30 a. m. and the patient did not awaken till 6 p. m. She then took a little nourishment and again went to sleep after emptying her bladder voluntarily. A more or less restless night followed. She could be easily aroused from light slumber and took some light nourishment at intervals during the next day, and had lucid intervals, but in the main appeared drowsy. This probably should have aroused my suspicions but did not till the next

morning, when I found she had a right-sided hemiplegia and greatly increased hebetude. She died during the forenoon, about forty-eight hours after operation. No autopsy was permitted The wound had healed per primam.

There is hardly any doubt in my mind that this was a case of cerebral apoplexy, brought on immediately on her arrival at the hospital, and that her apparent quiet sleep was really the early part of her attack, and that it was brought on through fear of operation altering blood pressure and either causing rupture of cranial blood vessel or release of thrombus from her heart lesion. As a matter of fact, the operation per se could not be held responsible, but the attendant excitement, small as it was, and with the least flurry possible on the part of the nurses, was too much.

I believe this case is instructive in demonstrating again the care and circumspection we should use in even trivial operations on the aged and weak.

In conclusion, I believe, with Dr. Alt, that deaths after cataract operation are more frequent than we have been led to believe, but, as he says, "it is nothing new, and probably every man with a large experience has had one case or more. Yet nobody cares to have these cases published too widely." That much may be done to lessen the frequency—small though it may be—of mania or death, by proper attention to such details as have been outlined here, not remitting in the least every endeavor to maintain perfect asepsis in our work. We have done away with the dark room and long confinement in bed after cataract operation, let us not cling too closely to the fetish of the bandage on the nonoperated eye. I believe it is wise to give some nerve-quieting drug, such as morphin, after the operation, to insure rest and quiet. And it would be well to see that patients become accustomed to the hospital surroundings sufficiently long before operation. I know the economic reason for not observing this as often as we should, but nothing compensates for ill results and it is false economy. And so long as we see nothing to the contrary, it might be well to utilize the results of Dr. Martin H. Fischer, of Cincinnati, and flush the system with plenty of water, reduce the flesh intake, increase the vegetable intake and alkalinize our patients with a half gram sodium carbonate in Vichy water every hour to avoid toxic conditions and secondary glaucoma.

XIV.

CONCERNING TWO CASES OF DERMOID AT THE SCLEROCORNEAL MARGIN.*

BURTON CHANCE, M. D.,

PHILADELPHIA.

The socalled dermoids of the sclerocorneal margin may be common enough, and their characteristic properties well enough known, yet their occurrence is only relatively frequent. Indeed, in Dr. Schwenk's service at the Wills Hospital in the past fifteen years only five instances have been recorded. Therefore, the presentation of these two cases today may not be uninteresting, especially as they were under observation at the same time in the past midsummer.

A Russian boy, aged 15 years, was referred to the hospital by the school physicians in June, 1912, to obtain glasses for the relief of a moderate degree of farsightedness. Dr. Schwenk induced the father to allow him to remove a bluish white tumor from the boy's left globe. The patient's family had regarded the tumor as a birthmark, and were not especially anxious over the presence of it, as it had not appeared to have measurably increased in size in the past year. The base of the tumor was densely adherent to the sclera and extended for about 3 mm. on the cornea, in the lower outer quadrant. In the long diameter it measured 7 mm. and in the shorter 4 mm., and it protruded somewhat beyond the plane of the tarsal borders, through the palpebral fissure. It was of quite firm consistence; it had resisted pressure from the lids, and presented no evidences of becoming pedunculated. There were several rather stiff hairs on the summit. There were no other anomalies observed in the ocular structures of either eye.

The tumor was excised by careful dissection with a Beer's

*Presented in abstract at a meeting of the Wills Hospital Ophthalmic Society, on December 2, 1912. From the service of Dr. Schwenk.

knife. The conjunctiva about the base was loosened for several mm. The base was composed of densely felted fibers continuous with the sclera, and extended well onto the cornea. The dissection was quite bloodless. The conjunctiva was united by two sutures over the bulbar surface and drawn well over the raw surface of the cornea. Nothing hindered the progress of the healing, which was accomplished in five or six days. A densely white opacity, however, remained in the cornea. The histologic study certainly shows the tumor to have been a dermoid. It is composed of fibroelastic tissue chiefly, surrounded by a layer of squamous cells with feeble papillary prolongations extending into a narrow layer of pigmented epithelial cells and newly formed branching spindle cells. Just beneath the outer surface of the mass are a number of well formed hair follicles.

The second case was in an Italian girl, aged 13 years, who came at about the time the boy was leaving the hospital. In this instance, though it had existed since birth, the family was much concerned, as they believed the tumor had grown distinctly larger in the past year. They could not account for it, and were alarmed lest it might be a malignant growth.

The tumor mass was not as large as that in Dr. Schwenk's case. It occupied the lower temporal quadrant of the right cornea and extended farther on the sclera than on the cornea. It was rather pink, while the boy's was a grayish pearl. A few fine hairs projected on the surface. The convexity of the mass was soft and pliant, but the tumor was firmly imbedded by a broad base.

I excised the tumor by a dissection, after complete loosening of the surrounding conjunctiva, all as in the manner of Dr. Schwenk's operation. Healing followed within a week; a densely white though shallow mark remained on the cornea.

The tissues of this specimen and those from Dr. Schwenk's case were prepared by Dr. Brinkerhoff, the pathologist of the hospital. The general view of the sections disclosed many characteristics common to dermal tissue.

The substance of the tumor is composed of fibroelastic tissue chiefly, and is covered by a more or less laminated squamous epithelial envelope, except at the base. Near the surface is a layer of polymorphonuclear leucocytes and lymphocytes, beneath which is a layer of spindle connective tissue cells. The

center of the growth is occupied by a multifarious collection of fat cells; quite large and complete sebaceous glands; hair follicles with their retained shafts; and, scattered throughout the substance are epithelial islands, the cells of which vary in form and arrangement. There were but few blood vessels. Much pigment, in small stellate and branching masses, is sprinkled throughout the tissues. In one of the sections is shown a quite large cystic cavity with loose pigment spread over the lining of the walls. The epithelium resembles the true epidermis, and the surface is undergoing active keratosis.

The details of the specimen from the girl's eye show how complex the tumor was, and the epithelial and pigmentary changes noted, without doubt indicate that pathologic activity had been excited within it; and it is therefore quite probable that the anxiety of the parents was well founded and that the tumor had increased in size during the past year.

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

BY

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Gonorrheal Iridocyclitis, With Observations on Its Relation to Socalled Rheumatic Iritis.

COBBLEDICK, A. S. (*The Ophthalmoscope*, December, 1912), after emphasizing the fact that many mild cases of "iritis" are accompanied by cyclitis, suggests that "iridocyclitis" is a better term, as more correct and less misleading than the term iritis. Personally he believes that cellular deposit on the cornea is much less marked in gonorrheal iridocyclitis than in any other type. A typical case shows intense injection of the ocular conjunctiva and sclera, absence of exudation and cellular elements in the anterior chamber, and of posterior synechiæ, very intense pain and photophobia. It may, however, be protean in its character. Sometimes it is a plastic iridocyclitis, with or

without hypopyon; less of it is hemorrhagic in type. Other cases are accompanied by slight pain, with or without adhesion to the anterior capsule of the lens. May have considerable vitreous opacity and temporary partial loss of vision. The final result, however, is better than in any other form of acute iridocyclitis.

The attacks are always unilateral, although each eye is usually attacked at different times. There is a tendency to recurrence, the interval between the attacks in the author's series being from a few months to ten years.

Prognosis is exceedingly good. Diagnosis is easy when there is a history of recent gonorrhea and when the iridocyclitis is of the intense painful type, with little or no deposit on posterior surface of the cornea. Syphilis must be excluded, although the author did not find it at all a common cause, possibly because private cases, from which his reports were taken, subject themselves to better treatment. The urethra must be examined for gleet, the urine for shreds, the prostate massaged, and a careful bacterial examination made. Nine cases of recurrent iridocyclitis are reported, in eight of which the gonococcus was demonstrated.

Treatment.—Leeches, aspirin at bedtime, and a gonococcus vaccine of mixed strain in dose of twenty millions was used.

W. R. P.

Miner's Nystagmus.

Butler, T. Harrison (*The Ophthalmoscope*, December, 1912), advocates adopting the term suggested by Mr. J. Jameson Evans, "Coal Miner's Neurosis," for the reason that the disease is solely confined to workers in the coal mine, and is a different clinical entity from occupational nystagmus. He also holds that nystagmus is not essential to the diagnosis of the disease, and describes three cases in which it was absent. He proves by case reports that hemeralopia is a symptom of the disease; but that refractive errors were no more common than among normal miners. Relapses are the rule, and the author believes the miner who has suffered an attack of miner's nystagmus will never be able to return to his work without a recurrence of its symptoms.

In conclusion he says: "I am quite unable to form any opinion as to the exact cause of the disease. I believe it to be a central cerebral disease, like the nystagmus of insular sclerosis,

It is characterized by twitching and rhythmic movements of the various groups of muscles, the ocular muscles being chiefly involved. The hemeralopia is still a puzzle and requires elucidation.

"The affected men always appear to me to be highly strung and of nervous types, but this is only a personal opinion. The disorder of coordination is caused by a condition which is peculiar to the colliery. Lack of light is an almost certain factor. Inhalation of poisonous gases may be a factor, and there are probably other factors which have so far escaped our notice." W. R. P.

Lengthening a Rectus Tendon in Squint Operations.

Harman, N. Bishop (*The Ophthalmoscope*, January, 1913), describes the following operation for lengthening a rectus tendon, either alone or in conjunction with the shortening of the opposite rectus:

"The tendon to be lengthened is exposed a short distance from the insertion. A small vertical buttonhole is cut parallel to the plica semilunaris and close to its edge. Tenon's capsule is cut and pushed back similarly. A squint hook is passed beneath the tendon and slowly lifted, so as to draw the tendon into view. Then two cuts are made in the same edge of the tendon, one on either side of the hook, as far apart as possible, so as to divide the tendon at each cut up to the middle line of the tendon. Then the hook is pushed slightly to one side, so that a cut may be made from the opposite edge of the tendon between the two cuts already made, and this cut is made from the edge right across the middle line of the tendon so as to sever two-thirds of its width. Immediately this third cut passes beyond the middle line the tendon will be felt to give, and it will yield distinctly as the cut is continued."

The operation has been performed in six cases with good results. W. R. P.

A Case of Soamin Poisoning Resulting in Optic Atrophy.

Elliott, R. H. (*The Ophthalmoscope*, January, 1913), reports a case of optic atrophy following intramuscular injection of soamin. The patient, a man of 32 years, with secondary manifestations of syphilis, was given ten doses of ten grains

each on alternate days. Seven days later, the vision of the right eye became blurred and he was greatly annoyed with photopsia. Examination showed right vision with correction 6/9, left vision 6/6. Right disc was very pale, except for a narrow margin on the inner side. The left disc was also very slightly paler than normal. The right visual field showed extreme contraction, and the left field was also somewhat contracted. W. R. P.

A Year's Record of Cataract Extractions.

Killick, Chas. (*The Ophthalmoscope*, January, 1913). The intention of the paper is to describe a few points in connection with the cataract extractions performed during 1911 at the Kent County Ophthalmic Hospital. The series comprises seventy-six cases, sixty-nine of which were primary extractions and seven secondary.

The method adopted is the combined operation, which is preferred to the simple extraction, mainly because of the elimination of the danger of iris prolapse.

Preliminary iridectomy is not regarded with favor, on the ground that it seldom hastens maturity of the lens and that less traumatism is inflicted upon an eye if both operations are performed at one sitting.

The patients are allowed to walk from the operating room back to the ward.

The cataracts are removed, irrespective of ripeness, as soon as the patient's ability to perform his usual occupation is markedly impaired. The only complication encountered, after-cataract, is dealt with later on.

With regard to the operation, the following points are emphasized: A large corneal section, including a conjunctival flap of moderate size; not too much iris should be cut away, because of the disfiguring coloboma resulting—if too little is removed, there is a tendency to adhesion of the pillars; and utmost care should be given to the toilet of the wound.

Complications.—Loss of vitreous occurred in three cases, in one of which no sight was restored. Iritis was responsible for one lost eye. Nineteen patients had after-cataract, ten of which were needled with good result. A list of patients, with the tabulated results as far as can be ascertained in each case, is appended. W. R. P.

Brawny Scleritis.

Verhoeff, F. H. (*The Ophthalmoscope,* January, 1913), after reviewing the literature on "Brawny Infiltration of the Sclera and Conjunctiva," reports a case in which a positive Wassermann reaction was obtained and histologic examination made.

The condition was observed in a man of 76 years, who for three years had occasional inflammation of his left eye for several weeks at a time. During the last few months the eye had been very painful at times.

Examination of left eye.—The cornea is clear except for fine precipitates on its posterior surface. The bulbar conjunctiva and episcleral tissue are moderately congested and thickened all around the cornea. Above, there is a flattened quadrilateral swelling, yellowish in color, corresponding to the insertion of the superior rectus, and on the nasal side a similar swelling corresponding to the insertion of the internal rectus. The pupil, semidilated (atropin), shows no definite synechiæ. The lens is slightly cataractous, preventing a good view of the fundus, which, however, seems normal. Tension slightly elevated. Vision of left eye, light perception only.

One month later the right eye became similarly involved. The episclera was moderately congested throughout, and showed two thickened areas at the sites of the superior and internal recti tendons. Otherwise the episclera was free from infiltration. In the zone of the perforating vessels above, the sclera showed a number of irregular bluish translucent areas, not elevated, the largest measuring about 3 mm. in diameter.

The left eye was enucleated. Pathologic examination showed two flattened quadrilateral nodules, each about 7 mm. in diameter, one corresponding to the tendinous insertion of the superior rectus, the other to that of the internal rectus. On section the sclera is seen to be greatly thickened, especially at the sites of these two nodules, where it presents a gelatinous apparance. The ciliary body and anterior part of the choroid are also greatly thickened all around and gelatinous in appearance. In places there is no line of demarkation between the ciliary body and sclera.

Histologically the essential changes consisted in an invasion of the anterior portion of the sclera and recti tendons with granulation tissue richly infiltrated with plasma cells, and dif-

fuse plasma cell infiltration of the ciliary body and anterior part of the choroid. There were a few giant cells, and also areas of fatty degeneration infiltrated with pus cells and endothelial phagocytes, but no definite caseation. There were marked peri- and endarteritis.

Brawny scleritis is a distinct type of scleritis, differing essentially in both its clinical and histologic aspects from anterior nodular scleritis. Clinically it is characterized by the advanced age at which it occurs (usually over sixty), its insidious onset and extremely chronic course, and the diffuse congestion and thickening of the sclera and episclera without the formation of definite nodules. The infiltrated recti tendons, however, may simulate scleritis nodules. Ultimately the anterior part of the sclera becomes involved around its entire circumference, and the process also invades the cornea. Evidences of intraocular involvement, such as vitreous opacities and iritis, occur late and are relatively slight. Pain likewise does not occur until late. The intraocular pressure is normal or elevated. Both eyes are usually affected, although not always simultaneously, and the disease usually leads to blindness in one eye at least.

In the early stages there is a diffuse plasma cell infiltration of the sclera and episclera. Later on, possibly at the same time the sclera becomes pervaded by granulation tissue, the plasma cell infiltration increases and involves by continuity first the anterior part of the choroid and ciliary body, and, finally, the whole uvea. Necrosis of the granulation tissue takes place, showing itself as areas of purulent infiltration containing numerous endothelial phagocytes filled with fat, or as well-marked caseation. Giant cells may or may not be numerous. Peri- and endarteritis are marked in the affected tissues. Even in the advanced stages, where there is intense infiltration of the ciliary body, there is no formation of cyclitic membrane. Separation of the retina ultimately occurs, due to exudation of serum from the choroid.

The character of the lesions in brawny scleritis strongly indicates a syphilitic origin for the affection. This is also indicated by a positive Wassermann reaction obtained in the present case, but until such reactions have been obtained in a number of cases, or spirochetes have been demonstrated in the lesions, it cannot be regarded as absolutely established that brawny scleritis is a manifestation of syphilis. W. R. P.

Experiments on the Excretion of Salicylic Acid in the Ocular Humors.

WITHAM, FLOYD B. (*The Ophthalmoscope,* February, 1913.) With a view to explaining the therapeutic action of salicylic acid in sympathetic ophthalmitis, a series of animal experiments were carried out to ascertain its excretion in the aqueous.

Salicylic acid was found in the aqueous of rabbits' eyes four hours after injection; more strongly after hexamethylenamin salicylate than other salts; also the strength of the excretion was augmented by hot applications, dionin and subconjunctival injections which tended to increase the blood supply to the eye. The aqueous containing the excreted saylicylic acid was found also to have an inhibitive action on bacterial growth.

W. R. P.

Gonorrheal Infection in Eye Diseases.

CRIDLAND, BERNARD (*The Ophthalmoscope,* February, 1913), describes fully the effects of gonorrheal infection upon the various parts of the eye and its treatment.

There appears to be a variability in the virulence of the gonococcus itself, in the reaction of the conjunctiva to the gonococcus, and in the susceptibility of the individual to the infection.

Recent observations have shown that there is some relationshipship between trachoma and gonorrheal infection, some writers suggesting that a gonorrheal infection of the conjunctiva may produce or be followed by trachoma.

Most of the structures of the eye, as well as the lacrimal gland, may participate in a general infection by the gonococcus and its toxin. Gonococci have been found in the secretion of a number of cases of metastatic conjunctivitis in late stages, but have not as yet been obtained from the deeper structures of the eye.

Metastatic conjunctivitis is described as follows: A mild inflammation, mostly affecting the bulbar conjunctiva. The discharge, commonly mucoid, is scanty or may be absent. There may be chemosis or swelling of the lids, but there is no papillary hypertrophy, as may follow the inflammation in the direct infection. It is frequently the initial symptom, and sometimes the only manifestation of systemic gonorrhea, of which it is generally an early sign. As a rule, both eyes are affect-

ed simultaneously. Conjunctivitis runs its course as a pure conjunctivitis in 65 per cent of cases, whilst in 35 per cent complications are found, the most common of which is a superficial vesicular keratitis. Iritis is also a frequent complication. The average duration is about two weeks.

Metastatic keratitis is almost always recorded as a complication of conjunctivitis, but it may also occur in the course of metastatic iritis. It is of the superficial vesicular type, and tends to get well without any resultant leucoma. It may be symmetrical or asymmetrical, central or peripheral.

Affections of the sclera are not at all common; the few cases reported are regarded as an evidence of an extension of the inflammation to the interior structures of the globe.

While iritis of sytemic gonorrheal origin is more frequent than has hitherto been supposed, it is nevertheless a comparatively rare cause of the condition. On pathologic grounds, it is better to speak of the condition as iridocyclitis rather than iritis, even in the mildest cases, for there is evidence to show that the ciliary body is usually considerably affected even in cases where the stress appears to fall on the iris alone, and that in only a mild degree.

While gonococci have not yet been demonstrated in the uveal tract, the difficulties of bacteriologic examination are so great that it is not right to conclude that they are absent. It is reasonable to consider that the gonococci are brought to the uveal tract, lodge there and multiply, and that their presence and local formation of toxins produce changes in the structure. It is more often bilateral, and there is a tendency to recurrence.

As to the types of uveal inflammation, Byers differentiates the following: Mild, severe, or plastic iridocyclitis, exudative iritis, hemorrhagic iritis, recurrent and relapsing iritis, suppurative iridochoroiditis, and, lastly, those occurring in association with other conditions, namely, conjunctivitis, keratitis, retinitis and neuroretinitis, and dacryoadenitis.

It would rather seem that one has to deal with an inflammation of the uveal tract in which the stress falls on the iris and ciliary body, rarely on the choroid as well, and that perhaps bilaterality in the cases in which it occurs, together with a tendency to recovery, are suggestive in making the diagnosis when compared with like cases from other causes.

With regard to inflammation of the nerve and retina due to this infection, thirteen cases of neuritis and neuroretinitis have been reported to date, and one case of Gowers' of double retrobulbar neuritis associated with myelitis.

One case of tenonitis and several of dacryoadenitis have been reported due to gonorrheal infection.

In the treatment of these conditions vaccine therapy has proved a valuable adjunct. W. R. P.

The Postoperative Treatment of Keratokonus.

GRUNERT, Bremen (*Ophthalmology*, Vol. IX, No. 2, January 13, 1913), describes his experience with a new operation, which he has used on eleven eyes. He has modified Elschnig's method as follows: With a flat electrode a line is cauterized at the upper limbus for a length of 2 or 3 mm., the burn reaching into the parenchyma; then with the finest wire tip this line is extended into an equilateral triangle, one apex being continued as a fine line to the center of the cone. Two days later the chief operation is done under narcosis. The slough is scraped off, the cornea is split along the middle of the burned line from the center to the limbus. The central meridian of the cornea is then covered with a conjunctival bridge, after Kuhnt's method. Four weeks later the flap is transplanted back.

The following details are further emphasized: The pupil must be contracted to a minimum by eserin before the beginning of the chief operation. After careful removal of the slough, the conjunctival bridge is first formed, preferably from the external scleral conjunctiva. It should contain as little subconjunctival connective tissue as possible. It should be laid experimentally over the perpendicular meridian of the cornea, the sutures put in and tied, to see if it lies tense and covers at least a width of from 5 to 7 mm. The sutures are then loosened, the flap put aside and the cornea slit. He passes the point of a Graefe's knife 1 mm. below through the center of the cone, the sharp edge up, as in slitting an abscess, carries the knife point to the angle of the anterior chamber, elevates the knife and slits exactly the middle of the burnt line up to the scleral border. After the aqeous humor has flowed off the cone collapses, forming many small folds. The conjunctival flap is now laid over it and fixed with sutures. It lies loosely,

with the anterior chamber opened, and becomes tense only when the chamber forms again. Later as it contracts its tension increases, and is exerted upon the cone. The patients are left in bed for six to eight days with a double bandage. With each change of dressings eserin or pilocarpin is instilled.

When the sutures do not cut spontaneously, they are removed on the sixth day. The lower part of the flap retrogrades slowly toward the side, as it lies on intact corneal epithelium. Four weeks after the chief operation he restores the conjunctival bridge to its original bed, leaving the small portion that has become adherent to the denuded surface of the cornea. In some cases it had become atrophic, so that a transplantation appeared useless. It was then simply cut away. Four weeks later the part of the flap covering the burn not becoming atrophic, he removed or retransplanted this piece also.

We must confess that the details of the author's procedure are not clear from his description. E. C. E.

Observations Concerning Foreign Bodies Within the Eye Orbit.

Rogers, W. K., Columbus (*Ophthalmology*, Vol. IX, No. 2, January, 1913), presents the deductions from 116 cases of foreign body in the eye treated by different procedures and under varying conditions during nineteen years. In 102 cases the body was found by the X-ray, and localized eighty-eight times. Ninety-three were in the globe (eighty-one behind the lens, five in the lens, and seven in the iris or anterior chamber) and twenty-three in the orbit. Two of the foreign bodies were wood, two glass, three stone or brick, seven copper, six lead, and ninety-six iron or steel. Ninety-three magnet operations were done, two of which were for fragments of steel in the orbit, and ninety-one for substances in the globe; six cases declined operation, and two had their operations elsewhere. In fourteen the Hirschberg or Gruening magnet was employed, forty-two were done with the Lippincott magnet or a flexible shaft extension to the giant magnet, and twelve exclusively with the giant magnet. In no case did the Lippincott magnet or flexible shaft fail to remove a foreign body located in the interior of the globe. There were ten operative failures out of fourteen cases with the Hirschberg magnet. There were six failures with the Lippincott magnet among twelve cases submitted to simple X-ray examination out of fifty-four cases

in which it or the flexible shaft was used. In sixty-four of these cases, therefore, the smaller magnet was used, in thirty-five the larger. In twenty-two both were used—sixteen times designedly, and six times because of failure in seven cases with the giant type. In the forty-two hand magnet cases thirty were treated within a week, five within a month, four within a year, two within two years and one in four years. The giant magnet was used exclusively in only twelve cases—all within three days, and most within twenty-four hours from the time of injury. In all of these cases removal occurred through the original wound. After operation, including subsequent removal of opaque cortex, vision was 6/6 in five cases (42 per cent), 5/20 to 6/10 in four cases (33 per cent) and 6/100 to 6/50 in three cases (25 per cent), with no subsequent general trophic disturbances or untoward operative sequelæ and an operative success of 100 per cent. This is, of course, a small group, of selected cases, affording the most favorable opportunity for the giant magnet. The portable magnet now in general use affords the highest percentage of operative success, so far as the mere removal of a foreign body from the eye is concerned; it is better adapted to the removal of encapsulated foreign bodies of long standing than the giant magnet, or foreign bodies located in the anterior structures, if the original wound has united. But when the foreign body is small, less than 3 or 4 mm. in area, and can be drawn into the anterior chamber and out through a marginal incision, a higher percentage of good vision and quiet eyes will result with the giant magnet than with the small magnet and posterior incision. When the foreign body is as much as 5 mm. in area, or if it is embedded in the posterior wall of the globe, or if it has entered through a wound back of the ciliary zone which is still open, the portable or auxiliary magnet, with a posterior incision as close to the foreign body as feasible, is to be preferred. As little traumatism as possible should be inflicted by the introduction of the magnet. But in spite of every caution more extensive hemorrhage, either from the incision or manipulation, with disturbance of vitreous and secondary detachment, will occur with this procedure than with a large magnet. He has had but two cases in 102 examinations in which X-ray findings were not verified. There are few surgical conditions about which the weight of opinion is more united

than that a metallic foreign body back of the lens must be removed, or the eye enucleated, for the safety of its fellow—instances of long toleration, to the contrary notwithstanding. He has not been able to save any eyes when the foreign body has been over 1 cm. in area, or when the globe has been extensively damaged, especially in the ciliary zone. Prompt enucleation seems to be the conservative procedure in such cases. If ciliary injection persists after a period of three months, enucleation becomes advisable. Infection is singularly rare. E. C. E.

Roentgenography of Foreign Bodies in the Eyeball.

Stover, G. H., Denver (*Ophthalmology*, Vol. IX, No. 2, January 13, 1913.). This lecture was given during the post-graduate ophthalmic course at the University of Colorado in 1913, and emphasizes the necessity for the X-ray examination in case of possible foreign body. The author prefers the method of Dr. Sweet, and is alive to the necessity for accurate work. An interesting observation is to the effect that he has found experimentally that pieces of thin glass from an electric lamp are shown in a well made skiagram of the eyeball.
E. C. E.

Colored Glasses for Hunting and Other Outdoor Occupations.

Schanz, Fritz, Dresden (*Ophthalmology*, Vol. IX, No. 2, January, 1913). After explaining the desirability of protecting the eyes during hunting and other outdoor occupations, the desirability of having glasses which afford protection without lessening the acuity of vision is also dwelt upon. This is especially necessary as regards the ultra violet rays, which are capable of producing inflammation of the eyes and skin. The best glass, according to Schanz, is what is known as Euphos glass, and for hunting purposes he advises Euphos-light A. Amundsen, in his South Polar work, used Euphos B. glass, and attaches a letter of endorsement. Speaking of artificial light, it is suggested that the source of light can be enclosed in a globe made of Euphos glass. E. C. E.

The New Antiglaucomatous Operations.

Dor, Louis, Lyons (*Ophthalmology*, Vol. IX, No. 2, January, 1913). A brief history is given of the different sugges-

tions for the relief of glaucoma, many of which are of only historic interest. Of the more recent measures, cyclodialysis is mentioned with faint praise, and the opinion given that it deserves to be studied. Most interest centers in the efforts to produce a subconjunctival fistula, which detail the author thinks belongs entirely to La Grange. The Elliot method of trephining the sclera is described as follows: He makes, first of all, a triangular flap of conjunctiva, dissecting it up as far as the cornea. The dissection of the flap ought not to be tangential, otherwise one may perforate the flap, but it is necessary for the point of the scissors to be directed in the plane of the posterior pole of the crystalline. The point at which the trephine should be applied upon the sclerotic ought to be also as near as possible to the limbus. One is made aware that he has penetrated into the anterior chamber by the flow of the aqueous humor mixed with blood, by a special sensation of sinking in, and by a movement of the patient. All trephines which have a diameter greater than two millimeters are considered by Elliot as being too large. In the course of the trephining it may happen that the disc will fall into the anterior chamber, but that complication is of no great importance. It may happen also that the iris becomes protruded. In such a case it should be incised in the radial direction; exceptionally one can also make a small iridectomy, but it must be without dragging upon the iris. When the pupil is somewhat displaced, or when the anterior chamber becomes filled with blood, the author practices lavage of the anterior chamber with the Mackeown irrigator. It is needless to suture the flap.

Sympathectomy is mentioned as one of the things that were, and the author thinks it will never be revived. His admiration is excited by the mention of posterior sclerotomy, which he thinks is a valuable operation, and should be a preparatory operation in the acute forms not already operated on, and the operation of salvation to the eye in the postoperative acute forms. E. C. E.

Visual Symptoms of Accessory Sinus Disease.

Fridenberg, Percy, New York (*Ophthalmology*, Vol. IX, No. 2, January, 1913). Among the more evident agencies, we have to deal with nerve irritation, either in the form of reflexes or from direct action of toxic substances, mechanical

pressure or hyperemia from vascular involvement. Among the superficial reflexes, which may be motor, sensory or secretory, we need but refer in passing to lacrimation, clonic or tonic spasm of the lids, fleeting edema in the same locality (independent of inflammatory processes), transient conjunctival or scleral injection, myosis, indicating hyperexcitability of the iris, and occasionally spasm of accommodation which cannot be explained by the usual reflex factors or by refraction error. Among the secretory neuroses we note transient rise of intraocular tension with prodromata, or actual pronounced glaucoma in an acute attack, or with continued high tension, disappearing promptly under treatment of the accessory sinus involvement. It is possible that vitreous dust and some lenticular opacities and changes may well be due to disturbed nutrition of the choroid, dependent on long continued reflex irritation, although here the factors of toxic inflammation and of chemotactic action probably play a more important role. Sensory neurosis, causing fleeting or more or less continuous pain in and about the eyeball, radiating to temple, brow and occiput, and often of an exquisitely hemicranic type, have been reported in cases where inflammatory conditions of the orbit, the general and immediate cause, could with certainty be excluded. The symptom complex of asthenopia, whether accommodative, conjunctival, muscular, or retinal, is not infrequently found in cases of long standing accessory sinus disease, and careful rhinologic examination is imperative in every case of this nature in which the condition of the refraction and of ocular balance is not such as to explain the symptoms or in which their correction fails to give immediate relief. Disturbances of central vision can hardly be explained on the basis of reflex irritation, and give evidence of direct optic nerve involvement on a mechanical, vascular, or toxic basis. Motor disturbances are an indication of mechanical interference by dislocation of adjacent structures, such as a bulging accessory sinus wall. Pure nerve palsies are rare. The involvement of the optic nerve is often manifest to ophthalmoscopic examination, either as neuritis or choked disc in acute cases, and as a general atrophy including the entire disc or a more localized pallor of the temporal halves in many chronic cases. Hyperemia and minor changes in the vessels may be observed at a compara-

tively early stage. In optic nerve affections having their point of attack some distance behind the globe, as in posterior ethmoid or sphenoid sinus disease, a retrobulbar neuritis is the rule rather than the exception. In this form of neuritis the optic nerve involvement may be a purely toxic type. There is no form of visual field contraction which can be considered characteristic or pathognomonic, and there is hardly a single one which may not depend on accessory sinus suppuration. The commonest form is, however, central or paracentral scotoma of retrobulbar neuritis, ring scotoma, and irregular central defects, with or without concentric contraction for white and colors, and frequently without ophthalmoscopic findings. Another form of central defect to which attention has of late been called is the enlargement of Mariotte's spot. The frontal sinus plays a minor role in the optic nerve complications.

E. C. E.

Theory and Practice in the Treatment of Glaucoma.

Parsons, J. Herbert (*Lancet*, January 6, 1912). Glaucoma, in the broad use of the term, is the condition of pathologically increased intraocular tension. Two great groups of cases may be distinguished: those in which increased tension is the result of inflammatory changes occurring in the ciliary body, and those in which there is no evidence of primary inflammatory change in any part of the eye. It is well to reserve the term glaucoma, in its narrower sense, for the latter group. The pathology of these cases is quite different, and it is amongst them that iridectomy and cognate operations are most clearly indicated. This group again is broadly subdivided into two subgroups—primary acute and chronic glaucoma.

Primary acute glaucoma is remarkably amenable to operative treatment by iridectomy. The effect is little short of magical: tension and pain are relieved immediately, and if the operation is performed sufficiently early, vision is rapidly restored. In chronic glaucoma, on the other hand, iridectomy often fails to stay the progress of the disease. It is by the brilliant results of iridectomy in primary acute glaucoma that von Graefe is still held to merit that crown of immortality which he wears as the benefactor of mankind.

Von Graefe had noticed the diminution of intraocular tension following iridectomy in cases of partial anterior staphylo-

ma, corneal ulcer, and so on. He was of the opinion that experimental researches on animals supported the view that excision of a broad piece of iris permanently diminished the tension of even the normal eye. Subsequent experiments by more delicate methods do not support this view, and it must be conceded that iridectomy for glaucoma was founded upon deductions from false premises.

Then follows a resume of the generally accepted theory as to the constancy of normal intraocular pressure. Upon this theory is built the retention theory of glaucoma, viz., that the increased tension of glaucoma is caused by the retention of an excess of lymph within the eye. Owing to obstruction at the angle of the anterior chamber, the path of the fluid from the anterior chamber to the canal of Schlemm is blocked and the tension of the eye rises. The explanation of the efficacy of iridectomy is that the operation opens up the filtration angle and thus restores communication with the canal of Schlemm. Iridectomy in chronic glaucoma is held to fail because the obstruction at the filtration angle is due to firm fibrous adhesion of the root of the iris to the corneosclera, and the operation fails to restore permeability of these tissues.

Not infrequently the operation of iridectomy for glaucoma has been attended by the incarceration of a small portion of the iris in one angle of the wound. In such cases the scar is weak in this situation and subsequently bulges, so that a so-called cystoid cicatrix forms. Although a weak scar of this nature has several grave disadvantages and dangers, it has been found that the effect of the operation on the progress of the glaucoma has been much better than when an apparently more perfect surgical result is obtained. This effect has been so striking that in spite of the dangers of late infection, sympathetic ophthalmia, and so on, a deliberate effort has been made to produce a cystoid cicatrix.

In other cases the iridectomy wound has not healed firmly, although no incarceration of iris occurred. The subconjunctival tissue over the wound has been swollen and edematous, and has remained in this condition for an indefinite period. Such cases have also done unexpectedly well from the point of view of the relief of glaucomatous symptoms. The explanation again has been that the weak scar permitted the permeation of the intraocular fluid, and such scars have been termed "filtering cicatrices."

In this case again the effect has been so striking as to have appealed very strongly to surgeons of wide experience, so that over and over again, attempts have been made to elaborate some method of insuring the formation of a filtering cicatrix in this operation. Such are the "small wedge operation" of Lieutenant-Colonel Herbert and the modified iridectomy operation of Lagrange. Others have relinquished the iridectomy and aimed direct at the development of a filtering cicatrix without adventitious aid. Such are the trephine operation of Major R. H. Elliott and the "small flap operation" of Lieutenant-Colonel Herbert.

Now, these operations have given satisfaction in direct proportion to their success in producing the object aimed at—viz., the provision of a channel permeable to the intraocular fluid. When that object has been attained the ameliorative effect upon the progress of the disease has also followed. Of course, in such cases there is great danger of reasoning in a circle and attributing success or failure to the wrong cause. But so far as they go, they support the view that the establishment of a filtering cicatrix is a cure for chronic glaucoma, or, at any rate, as much a cure as iridectomy is for primary acute glaucoma.

While the theory of filtering cicatrices is perfectly logical with the assumption that aqueous outflow is filtration, it is diametrically opposed to the circulating conceptions of intraocular pressure, which are:

"1. The intraocular pressure is vascular in origin and nature, and stands and varies with intraocular venous pressure. 2. The intraocular pressure is influenced directly and absolutely by a rise in general venous pressure, but only relatively by increase in arterial pressure. 3. The intraocular volume is a fixed quantity. 4. The corneoscleral envelope represents a rigid case." It will be seen that the primary assumption is that the walls of the globe form a rigid case like the skull, and that, therefore, the whole of Dr. Leonard Hill's work on the cerebral circulation can be applied directly to the intraocular circulation.

Dr. Thomson Henderson's arguments in favor of the view that the walls of the eye are rigid, consist chiefly in criticisms of my own writings. I do not regard it as "flat contradiction" to say that "unlike the cranium, however, the eyeball is not a rigid case," and that the stretching is "quite an appreciable

amount," even when the intraocular pressure is raised from 19 mm. to 70 mm. Hg. The last statement is based upon reliable experimental observations by Koster. Dr. Henderson brings forward no evidence whatever to controvert these statements, and we must therefore conclude that, though within the range of physiologic pressures the walls of the globe may be regarded as practically a rigid case, beyond that range deformation occurs which must be taken into account if accurate deductions are to be made.

Within the narrow range of pressures in which the eyeball may be regarded as rigid, the general application of Dr. Hill's researches may be freely admitted. Even they, however, should not be pressed too far. Under the conditions named the general features of the intraocular pressure are doubtless the same as those of the intracranial pressure, but only direct experiments on the eye can demonstrate what modifications in detail may be present. Beyond the given range one fact alone suffices to show that the conditions are quite dissimilar. When the animal is killed the intracranial pressure promptly sinks to zero; not so, however, the intraocular pressure, which, under these circumstances or when the eye is excised, only reaches zero after a prolonged period—in fact, after fluid has filtered out.

With regard to the production of aqueous, Dr. Henderson adopts the secretory view, in common with many who hold what he calls the "volumetric" theory.

Resorption of aqueous is regarded as a pure diffusion into the veins, particularly the canal of Schlemm and the veins of the iris. Dr. Henderson believes that many of the ciliary vessels which have been described as arteries are really veins.

On the assumption that even under pathologic conditions of increased tension the walls of the eye are still a rigid case, the explanation of glaucoma is held to be due, not to a "retention of intraocular volume," but to a "retention of intraocular pressure." The language is cryptic, but taken with the context the meaning is clear. On blocking the venous exits—canal of Schlemm by sclerosis of the ligamentum pectinatum and anterior ciliary veins by peripheral anterior synechia—the elastic blood vessels are transformed into a rigid system of tubes. In such a system the outflow pressure is always higher than in a similar system of elastic tubes; hence in glaucoma the lowest

circulatory pressure is that in a rigid system, and therefore the intraocular pressure is maintained at a correspondingly high level.

Resorption of aqueous is reduced to the area of the iris veins. The aqueous is therefore not entirely cut off from the veins; the aqueous volume is displaced by increase of total vascular volume, so that the anterior chamber becomes shallow. The explanations of the dilatation of the pupil, haziness of the cornea, occlusion of the angle of the anterior chamber, and so on, are very ingenious, but are open to criticism in many respects.

The efficacy of iridectomy in glaucoma is attributed to the free opening up of access to the iris veins.

There yet remains an operation for chronic glaucoma which has not been considered—cyclodialysis. By this means Dr. Heine attempted to provide an exit of the intraocular fluid by way of the suprachoroidal space. It appears to be satisfactory so long as the artificial detachment of the ciliary body from the sclerotic persists, but fibrous reunion occurs and the intraocular tension again rises. Dr. A. Freeland Fergus combines the operation of trephining with cyclodialysis.

In conclusion, if the criticisms put forward here are just, the formation of a filtering cicatrix holds out the best hope of alleviating chronic glaucoma. N. M. B.

A Note on Glaucoma.

Hill, L. (*Lancet*, January 27, 1912). In his interesting paper on Theory and Practice in the Treatment of Glaucoma (abstract of which appears in this number) Mr. J. Herbert Parsons makes the following statement: "The physical conditions of the formation of lymph in other parts of the body are consistent with its production by a process of filtration out of the capillaries; the amount poured out and its chemical composition are dependent upon the difference of pressure on the two sides of the filtering membrane—i. e., the capillary wall." I think that the evidence which has accumulated on all sides in recent years controverts this statement, which is altogether opposed to the present position of physiologic knowledge. The evidence is decisively in favor of the view that the flow of lymph is controlled by the activity of the tissue cells—that is, controlled by their changing and elusive physicochemical state,

or, if we choose to call it so, by their vital selective activity. I venture to say that there is no evidence which demonstrates that there is a hydrostatic difference of pressure on either side of the capillary wall. The capillaries are lined by wet protoplasmic cells and are surrounded by wet protoplasmic tissue cells. There is nothing equivalent in structure to a rigid filtering membrane. The delicate choroidal fringes in the eye hang in a bath of aqueous fluid, and the cells lining the fringes secrete the fluid. Each pulsatile expansion in the arteries of the eye helps to drive a little of the aqueous into the efferent veins, and thus the effective circulation of this fluid is maintained—by secretion and the pulse.

I would say that the cause of the increased tension in glaucoma primarily is altered metabolism. The altered metabolism is produced by bacterial toxins or otherwise, and results in chemical changes in the colloids of the eye which swell by absorbing more water. Obstruction of the venous and aqueous outflow by sclerotic changes with resulting lack of oxygen and increased production of acid may well be a possible cause. Martin Fischer has shown that an excised eye becomes glaucomatous if placed in acidulated water, and to such an extent that it may burst the sclera. The presence of any salt markedly lessens the swelling produced by acid, and "subconjunctival injection of 1/8 to 1/6 molecular (4.05 to 5.41 per cent) solutions of chemically pure sodium citrate in clinical cases of glaucoma is entirely harmless and is always followed by a prompt fall in ocular tension." The fall in tension is appreciable within ten minutes, and lasts from three to six days, with relief of all the subjective symptoms. The enucleated eye placed in an acid solution shows a progressive decrease in the depth of the anterior chamber. This Fischer attributes to the unequal swelling of the colloids of the eye, those posterior to the lens swelling more than those anterior. Fischer suggests, then, that the obliteration of the so-called filtration angle is not the cause but the result of the glaucomatous condition.

The eye is to all intents an indistensile structure (unless its coats are altered by metabolic change). The increased swelling of certain tissue elements in the eye must be compensated for by a diminished volume of blood, and this entails increased pressure in the capillaries and veins within the eyeball. In such case there must be an approximation towards a rigid system of

vessels, for otherwise the circulation would not be maintained. The tension of the eyeball is the capillary venous pressure which obtains in the eye of the normal or glaucomatous person. The eye, according to the varying state of its metabolism, can contain more tissue substance and less blood, or more blood and less tissue substance. It is distended with tissue fluid absorbed by the colloids in the eyeball as well as with blood, and hence the positive pressure does not wholly disappear at once when the circulation ceases. Dr. Thomson Henderson has done great service in drawing attention to the conditions which control the tension of the eyeball and the circulation, but I think he has not laid sufficient stress on the primary cause of the edema—viz., metabolic change in the tissues.

If the primary cause of glaucoma is disordered metabolism, the best treatment is the promotion of a greater flow of tissue lymph. Just as in other acute and chronically inflamed parts, incisions, congestions, cupping, etc., provoke the healing process by bringing more blood and tissue lymph, so in the glaucomatous eye that operation will be most effective which allows the most free circulation of blood and of aqueous fluid.

N. M. B.

A Case of Acute Myelitis With Optic Neuritis (Neuromyelitis Optica).

Clowes, E. F. (*Lancet*, March 23, 1912), reports a case with remarks by Dr. F. Taylor, as follows:

Double optic neuritis is occasionally seen in association with acute myelitis. The optic neuritis generally precedes the myelitis by some days or weeks; but it may occur simultaneously, or first appear some days after the onset of the myelitis. The neuritis is in some cases only shown by a temporary amaurosis; in others there is obvious papillitis. The myelitis is, as a rule, not different in its symptoms and course from myelitis unassociated with an ocular lesion. The prognosis of the case must depend on the severity of the myelitis, and the mortality has been about 50 per cent. The optic neuritis has often subsided, and vision has been recovered.

There is no satisfactory conclusion as to the nature of the lesion; most authors are inclined to regard it as infection attacking the cord and the optic nerve separately. The evidence is strongly against the spread of infection, or inflammation, from the spinal cord to the optic nerve.

Pathologically, the lesion of the cord is seen to be a diffuse or disseminated myelitis, affecting either the cervical or dorso-lumbar region, or both; and histologically, in some cases, numerous endothelial cells undergoing fatty degeneration have been found around the vessels in the affected parts. To these importance has been attached by some authors, but others are satisfied that such elements are not peculiar to those cases. In a few of the fatal cases some indications of encephalitis have also been present. In two cases by Auerbach there was clinical evidence of cranial nerves being involved; and in the present case there were noted a diminution in the sense of smell and loss of taste in the left half of the tongue. A reference to a few cases will show some of the points of difference among them.

In my own case vision declined and was lost in the course of two days, and paralysis of the legs began a fortnight later. No papillitis was ever observed, but the optic discs were atrophied three months later and I inferred that there had been a retrobulbar neuritis. Some improvement nevertheless took place in the patient's vision for a time, to the extent of her being able to see objects, but it was still much impaired twelve months later. The arms were slightly involved, and hyperesthesia of the chest wall was present at the upper border of the fourth costal cartilage. The patient died after fourteen months' illness. There was no postmortem examination.

The case which forms the subject of this paper was much more rapid. The disease was an acute ascending paralysis, commencing with indications of meningitis in the form of acute pain and spinal rigidity. Vision was impaired on the following day, and on the day after this evidence of slight papillitis, more on the right side, was observed. The upper limit of hyperesthesia was one inch below the nipples. On the ninth day of illness the breathing was almost entirely abdominal, but the arms could be moved apparently without any loss of power. On the fourteenth day marked dysphagia set in, and she died while attempting to swallow fluid. N. M. B.

Corneoscleral Trephining (Lt.-Col. R. H. Elliot's Operation).

Lang, B. T. (*Lancet*, April 13, 1912). It is widely admitted that every kind of successful operation for primary glaucoma produces a leak, and that within certain limits the success of

the operation is proportional to the amount of leakage produced. In many operations the eventual leakage area is of uncertain size, and depends on the extent of the failure of scar formation in the wound. On this account the results obtained by such operations are far better in elderly people with feeble powers of repair than they are in middle aged people whose wounds heal soundly.

Lieutenant-Colonel R. H. Elliot, I. M. S., has solved the problem. From beneath a conjunctival flap he removes a large portion of the corneosclerotic with a trephine. The resulting hole is too wide to become occluded by scar tissue. But in order to obtain efficient leakage the hole must be made into the anterior chamber. The aqueous can then escape into the spaces of the subconjunctival tissue.

So far as I am aware, all the cases of failure of this operation have resulted from one of two causes—either because the trephine hole is too small and gets blocked by scar tissue, or because it is made too far back and gets blocked sooner or later more or less completely by the iris or iridic exudate.

Then follows a detailed description of the operation.

N. M. B.

The Treatment of Early Stages of Senile Cataract.

Smith, H. (*Lancet,* April 20, 1912). This is a subject of supreme importance, both to the patient himself and to every member of the profession who has to deal with him. I have again and again been asked, "Can you do nothing to prevent the development of cataract, to cause it to disappear in its early stages, or to stay its development?" Until recently my answer has been in the absolute negative; that no such remedy is known to science. Some months ago a European lady came to me from a station eight hundred miles away, complaining that she could no longer see to read or write, and that her vision for distance was becoming rapidly useless. On examination I found a thin nebula on the front of each cornea in the pupillary area, the result of old-standing trachoma. I dilated her pupils with homatropin and observed that the nebulæ were only partially the cause of her failing sight, as she had incipient cataract in both eyes. I explained to her that we hoped to clear the nebulæ, which were very thin, and that thus we might improve her vision a little, but that she had cataract, which I

would advise her to have operated on a little later. I gave her a subconjunctival injection of cyanid of mercury (20 m. of 1 in 4000). She had to leave two days later, but wrote to me about a month later that the result was marvelous, as she could now see distance as well as ever and could thread a cambric needle with her ordinary presbyopic glasses. The corneal haze, having cleared up, was not sufficient to explain this, considering the condition of the lens. It was only explicable on the understanding that the hyperemia induced had acted on the lens as well as on the cornea. How this came about I leave to pathologists to explain.

I then determined to try this remedy on the early stages of cataract in patients whom I could keep under observation for a sufficient length of time.

Then follows a report of five cases in which this was tried.

The pain induced by a subconjunctival injection of cyanid of mercury under cocain is very severe—it lasts for three or four hours, after which it amounts to a mere inconvenience. To control this it is necessary to put the patient lightly under chloroform and to give him a hypodermic of at least one-third grain of morphia. The eye looks exceedingly ugly for several days, and patients should be warned beforehand not to be alarmed at this. I have never seen any evil results from the use of subconjunctival injections of cyanid of mercury; and the conjunctiva, after a few weeks, resumes its physiologic condition.

The improvement in these cases was first noticed by the patients on the third or fourth day, and improvement goes on steadily for close on a month. Time will show if this improvement will be permanent. I hope to be able to give the condition of the patients a year hence and to supplement the list.

N. M. B.

The Operative Treatment of Concomitant Strabismus.

Campbell, E. Kenneth, and Alexander, G. F. (*Lancet*, June 1, 1912). Admitting that for success in correcting strabismus by operation experience is all essential, it is yet necessary to be acquainted with the principles upon which our procedures are founded. In regard to the lateral rotators, the "muscular insertion" may be defined as the distal end of the fleshy belly of the muscle, the "tendon insertion" as the anterior extremity

of its tendon of insertion, whether natural or produced by resection of a portion, and the "potential insertion" as the point of the sclerotic touched by a tangential line drawn from the origin of the muscle. For a given cross-section the traction of one of these muscles varies, first, as the strength of the innervation to its contraction, and second, as the degree of its elastic tension.

It is obvious that by operative measures we cannot directly influence the former; hence we need only concern ourselves with the behavior of the muscles as elastic bands. The degree of their elastic tension varies directly as the distance between their origin and muscular insertion; hence it follows from Hook's law, "ut tensio sic vis," that, the innervation remaining the same, the traction is equally increased by the artificial rotation of the globe in the opposite direction to that of the action of the muscle and by the advancement of its muscular insertion over an equal number of degrees.

Increase of traction may thus be obtained by the advancement of the original tendon insertion, which may be carried up to 1 mm. from the corneal margin—i. e., simple advancement, and still more by resecting a portion of its tendon and advancing its new tendon insertion over a greater distance, which may extend up to the above point. The linear amount of advancement of the tendon insertion, original or new, is related to the number of degrees of the surface of the globe over which it is carried, as follows: Taking 23 mm. as the diameter of the scleral globe, its circumference $= 23 \times 3.1416 = 72$ mm., and hence 1 mm. of this corresponds to $360° \div 72 = 5°$. From this it is universally laid down that for every millimeter of advancement we obtain 5° of rotation of the globe; but, as will be shown, this is erroneous, being double the amount obtainable, which accounts for so many failures as to have brought about abandonment of the operation on a thoretic basis.

If T represents the traction of the internal rectus, it must also represent that of the external rectus, and if t represents the increment or diminution given to T by each degree of advancement or retirement of the tendon insertion of either muscle, it is obvious that if we advance that of the external rectus over $n°$ its traction becomes $T + n\ t$, and that as for every degree the globe is rotated outwards the traction of the

internal rectus is raised from T by t, while that of the external rectus falls from T + $n\,t$, also by t, it follows that equilibrium will be established when the traction of each muscle has arrived at T + $n/2\,t$ — i. e., when the globe has rotated through half the number of degrees of the advancement. Thus, to obtain a rotation of $n°$ we must advance the tendon insertion over $2n$ or $2/5\,n$ mm., and conversely an advancement of n mm. will effect a rotation of $5/2\,n$ — i. e., for every millimeter of advancement we only obtain 2.5° of rotation of the globe.

On account, however, of the yielding of the new tendon union, advancement, even on this basis, is generally found to be insufficient: hence a slight overcorrection of the deviation at the time of the operation should be aimed at, and this in cases under chloroform, which normally brings about a divergence, necessitates our giving the eyes a degree of divergence which the inexperienced would naturally consider excessive.

As the tendon insertion of the internal rectus is 5 mm. and that of the external rectus 7 mm. from the corneal margin, 4 and 6 mm. may be taken as the extent to which we can advance their muscular insertions without resection: hence the maximum rotation we can thereby obtain is 10° and 15° respectively. As the length of the tendon of the internal rectus is 3 mm. and that of the external rectus 7 mm., and as for the sutures to hold they must grip the tendon fibers, the maximum rotation we can obtain by resection with attachment of the new tendon insertion to its old site is for the former 5° and for the latter 15°, while from advancement to the edge of the cornea combined with resection the maximum rotation we can obtain is for the former 15° and for the latter 30°.

Tenotomy obviously acts in the opposite sense to advancement, the traction of the muscle being lessened by approximation of its muscular insertion to its origin—i. e., its relaxation; and as from 5° to 15° are obtained by tenotomy, this corresponds to a retirement of the tendon insertion over 2 mm. to 6 mm. A serious objection to tenotomy rises from the fact that when effective it is followed by limitation in the rotation of the globe in the direction of the action of the muscle, whereby concomitancy is lost and diplopia results for an object carried sufficiently far in this direction.

As both the internal recti acquire increased traction from the hypertonicity induced in them by the exalted innervation to

convergence, the rational treatment lies in conferring on both the external recti a correspondingly increased traction by advancement; hence, in strabismus of any considerable degree, we are in favor of advancing the external rectus of one eye to the extent sufficient to correct half the degree, and, preferably after four or six weeks, advancing that of the other to the extent requisite to obtain a slight primary overcorrection. In this way we secure retention of concomitancy.

It is only in cases of a degree beyond the power of a double advancement to correct that tenotomy should be resorted to, and if it is decided upon, as its effects are so variable, it should be done first, and after four or six weeks its action supplemented by the necessary advancement. Naturally it should be done on the less serviceable eye and will rarely be required on both.

This is followed by a brief description of the author's method of operation. N. M. B.

A Case of Color Blindness.

Edridge-Green, F. W. (*Lancet*, June 23, 1912). The following case is that of a man, aged 20 years, seen by me for the first time.

1. Examination with my lantern.—This examination was made with the largest aperture of my lantern, measuring seven-eighths of an inch in diameter. He called red A, nothing and green; yellow, red; red B, white; neutral 1, green; and green, white and red. This test was the shortest of any I made and lasted less than a minute, as I only asked the subject of it at the most to name fifteen lights.

2. Examination with the official test of the Board of Trade.—This test is an improved Holmgren wool test in which two new test colors have been added similar to the violet and orange in my classification test. The examinee picked out and matched all five test colors, green, rose, red, purple, and orange-yellow, easily and correctly; he did not touch a confusion color. Had I examined him by this test alone I should have passed him and had no suspicion that he was color blind. It must be noted that color names must not be used in testing by the Holmgren method.

3. Examination with my spectrometer.—The examinee said that the spectrum consisted of two colors, red and purple, with an intermediate yellowish or no color between. The red com-

menced at λ670. The uncolored region, which was quite uniform, extended from λ586-λ516. The purple extended from λ516-λ400. The most luminous portion of the spectrum was λ527-λ583.

4. Lord Rayleigh's color mixing apparatus.—This instrument is for making a mixture of thallium green λ535 and lithium red λ670 to match sodium yellow λ589. An absolutely normal match under rather difficult conditions was made by the man. His match was the same as that of Professor Trouton, Professor Porter, and myself. I must state, in justice to Lord Rayleigh, that this instrument, which he has kindly lent me, was not constructed as a test for color blindness, but for ascertaining the variations which are found in different people in making the above match. It is, in my opinion, the best piece of apparatus which has yet been designed for this purpose. I give the above observation simply as an example of his ability to make this match, as it is generally stated that a color-blind person is not able to do so.

5. Nagel's test.—Passed.

6. Stilling's test.—Could not read some of the figures. Rejected.

7. My bead test.—Rejected. Left many definite colors; put yellow with green and called yellow, green and put violet with blue.

8. My pocket test.—Rejected. Called brown, red; green, gray; and green, red-green.

9. My classification test.—1. (Orange.) Orange and yellow-brown. 2. (Violet.) Violet, blue, and rose wools; blue glass and blue silk; purple wool, silk, and cards. 3. (Red.) Red wool; rose silk; purple glass and orange card. 4. (Blue-green.) Green and brown wools; brown, yellow, and gray silks and neutral glass.

This case, which is similar to many that I have examined, shows how completely the official Board of Trade test fails in detecting a very dangerous case of color blindness. The lights used in my lantern are bright and definite colors, and similar to those used on the railway and at sea. It also shows the absolute necessity of color names in a test for color blindness. Many color-blind people are able to match very accurately; in fact, I have examined the pictures of a color-blind Royal Academician and have been unable to detect any fault in them. (*Archiv. für die gesamte Physiologie*, Band CXLV, p. 298.)

Can we wonder that there are accidents at sea when such a test as the above is official with the Board of Trade, and not a single medical man, either on the first examination or on appeal, is employed by the Board of Trade? It is now over twenty years since I, as adviser to the Board of Trade and on the International Code of Signals Committee, pointed out the defects of the Holmgren test. Though the Admiralty have made the lantern which I constructed for the Board of Trade their official test, the Board of Trade still uses the Holmgren test, though in a modified and not much improved form. The Holmgren test, in addition to rejecting many normal-sighted persons, allows half or more than half of those who are dangerously color blind to pass. Many will wonder why the examinee failed with my classification test, in which colored wools are also employed. This is because the method is entirely different. Color names are used and the selection of the colors is different. A color blind person with shortening of the red end of the spectrum may name ten pink wools correctly, but call the eleventh blue very decidedly, because the last chiefly differs from blue by the addition of rays occupying the shortened portion of his spectrum. This is the color we require in a test, whilst the other ten are useless. N. M. B.

The Ophthalmology of General Practice.

Hepburn, M. L. (*Lancet*, July 6, 1912). Many general practitioners would prefer to separate the two departments mentioned in my title, while others claim that there is no branch of ophthalmology with which they are not competent to deal after a few months' experience at an ophthalmic hospital. It is better to aim at an intermediate course, and a certain amount of knowledge of the subject is indispensable in practice, since unfortunately the family medical man is expected to be thoroughly acquainted with the diseases of every part of the body, including all the special departments. How difficult a standard this is to attain the best general practitioners know only too well, yet in many districts they are compelled to make the attempt.

Ophthalmology, perhaps more than any other subject, requires plenty of time and a large amount of clinical material to render one efficient and (which is so essential in the life of

most busy general practitioners) quick in diagnosis; and thus it happens that, starting with the best intentions, they get tired of the subject and prefer not to have the trouble of ophthalmic practice. It is when either an urgent or a very extraordinary case presents itself that we want proper principles to guide us in making a diagnosis and initiating a line of treatment.

Although there may be exceptions applicable to special circumstances, I will say at once that, speaking from my own personal experience as a general practitioner, I exclude the greater part of refraction work, all detailed ophthalmoscopic examinations, and all but a few operations on the eyeball and its appendages.

From the general practitioner's point of view, diseases of the eye may be divided into two groups: (1) External diseases, or defects which show some visible external signs; and (2) defects of sight, or diseases which show no visible external signs. These may be subdivided into: (a) Refractive errors, and (b) intraocular disease, or both.

Under the head of glaucoma, Hepburn says: "It is easy to see at once that the subjective symptoms may be, not without reason, attributed to a bilious attack, for which they are most commonly mistaken. An examination of the eye will quickly dispose of this error. The treatment consists in only one course, viz., the performance of an iridectomy. Eserin drops (½ to 1 per cent) instilled into the eye frequently is the only form of legitimate temporizing, and this can only be adopted for a few hours while preparations for operation are being made."

I have no hesitation in saying that the performance of iridectomy undertaken by the general practitioner himself in a case of acute glaucoma is an extremely injudicious procedure, since it is one of the most difficult and delicate operations in ophthalmic surgery, and yet where each point in the technic is of vital importance to the patient; it is comparatively easy to do an iridectomy of some sort, but to perform the operation in the proper way and restore the patient's sight, while avoiding at the same time all complications, is another matter altogether.

On the subject of squint and defects of muscular action the advice is given that although it is not essential, nor indeed advisable, that the general practitioner should carry through on his own account the treatment of a case of squint in every

detail, still he must be perfectly familiar with the various steps necessary to bring about as satisfactory a cure as possible, both as regards the deformity and also the visual acuity of the squinting eye.

I should advise a general practitioner to consider carefully before he undertakes any ophthalmic operation; it is impossible for him to create a good impression, but more often than not he will lose all the reputation he had already gained.

If it is thought that in one or two places I have expressed myself too strongly, it is because, after several years' independent experience of an ophthalmic and a general practice, I realize the difficulties met with in both, and that although they must necessarily be combined to a certain extent, a distinct line has to be drawn between the two; and I also believe it to be the sincere desire of many men in private practice to know how near they may approach this line with safety, alike in the interests of their patients and of their own professional reputation. N. M. B.

Pulsating Exophthalmos in Which the Carotid Artery Was Ligatured.

James, R. R., and Fedde, Fedden W. (*Lancet*, July 27, 1912). Cases of pulsating exophthalmos are not very common, only about twenty having been published in England, so far as we have been able to discover, since Frost's classical paper in the Transactions of the Ophthalmological Society, 1884 (Vol. III).

Ligature of the carotid appears to have been practiced in about half of these cases, and while there is nothing very unusual in our two cases, yet in our opinion they are worth recording. Both cases must be looked upon as examples of arteriovenous communication, presumably in the cavernous sinus, secondary to a fracture of the base of the skull.

While it is of course impossible to say that these two cases would have done just as well eventually had they been left to themselves, yet in our opinion the operation did good service by bringing about a cessation of the headache and buzzing, and thereby allowing the patient to get some much needed sleep. We have a vivid recollection of the pitiable state the first patient was reduced to before the vessel was ligatured.

N. M. B.

Eye Symptoms and Early Diagnosis of Diseases of the Nervous System.

Hinshelwood, J. (*Lancet*, September 14, 1912). There is too great a tendency, especially in this age of specialism, to regard the eye as one of those organs of the body which must be handed over to the exclusive care of the specialist, and hence sufficient care is frequently not bestowed by the general practitioner on the careful observation of the eye symptoms as an aid to general diagnosis. We must never lose sight of the fact that the eye is a part of the human organism, sharing in its fluctuations of health and often manifesting the leading characteristics and idiosyncrasies of the organism as a whole.

In fact, special knowledge and the general practice of medicine are so closely and intimately allied to each other, that you cannot divorce the one from the other.

Eye symptoms are very frequent in the course of diseases of the nervous system, and they are often among the earliest symptoms of the disease. Hence they frequently afford the first unequivocal manifestations of nervous disease, and may lead directly to the detection of grave organic disease of the nervous system, which had hitherto been unsuspected. In many of these cases successful treatment is only attainable when the diagnosis is made at an early period in the development of the disease, before extensive organic changes have occurred.

The patient may complain of no visual disturbance, and yet on careful examination of the eye indubitable symptoms may be present having a most important bearing on the case.

Ocular Paralyses.—Ocular paralyses are frequently of the very greatest importance in the diagnosis of diseases of the brain and spinal cord. Take, for example, meningitis in children, which often arises in a very gradual and insiduous way, and hence is very difficult to recognize with any degree of certainty at the onset. If, however, we find the child suddenly develops a squint, which on examination is found to be due to paralysis of an ocular muscle, then it gives a very different significance to the headache of which the child is complaining. It tells us that the headache is due to organic disease of the brain or of its membranes, and hence is no longer to be regarded as due to some functional disturbance.

A very excellent illustration of the great value of ocular

paralysis as a factor in diagnosis is to be found in the transient ocular palsies which are frequently met with in the early and preataxic stages of locomotor ataxia. There is another form of ocular paralysis, permanent in duration, partial or complete, which, however, is more commonly met with in the later or ataxic stages of the disease, when the diagnosis has been made evident from the presence of prominent symptoms. The transient ocular palsies, however, are most frequently seen in the very early stages of the disease, and not infrequently lead to its detection. These transient palsies may attack any ocular muscle, but most frequently the external rectus. These attacks of palsy last generally only for a very short period—a few hours, days, or weeks, disappearing spontaneously. The symptom observable by the patient is diplopia. Hence it should be an invariable rule in all cases of transient diplopia, particularly if this is recurrent, to strongly suspect the probability of the early stage of locomotor ataxia. No ataxia may be present at this stage. But examine carefully the condition of the knee jerks and with Argyll-Robertson pupillary phenomena, with probably a history of pains in body and limbs often described as rheumatic. The diagnosis is then clear, and the eye symptoms have led directly to it.

Pupillary Signs.—The best illustration of this is the Argyll-Robertson pupillary phenomenon, when the pupillary reaction to light is lost, whilst the contraction associated with convergence is preserved. Although not pathognomonic of locomotor ataxia, being sometimes met with in general paralysis of the insane and in cases of cerebral syphilis, it is frequently a very valuable aid to the early diagnosis of this condition. It is a very frequent symptom, according to Sir W. R. Gowers, being present in four-fifths of all cases. What gives it special importance is the fact that it is so frequently an early symptom, being often present in the preataxic stage of the disease.

Nystagmus.—Nystagmus is a not infrequent symptom of organic disease of the nervous system. This phenomenon occurs frequently in local affections of the eye which disturb vision, in albinism, and in miners. But the fact of importance to us is that it occurs in diseases of the nervous system of the most varied seat and character. It is usually present in disseminated sclerosis and in hereditary ataxia (Friedreich's disease), but not in locomotor ataxia. It occurs in many diseases

of the brain, diffuse and focal, and it is especially common in tumors of the cerebellum. Its diagnostic value is chiefly in excluding mere functional disorder and pointing to organic disease of the nervous system. It is of special value in the diagnosis of disseminated sclerosis, where it frequently occurs as an early symptom, and since the early diagnosis of this disease is often very difficult, it is frequently of great importance in calling attention to the true nature of the symptoms at an early stage.

Visual Fields.—In many cases the alterations in the visual fields may be the very first indubitable symptoms of cerebral disease, and hence its recognition is necessary for the early diagnosis of the condition. The best example of the direct bearing of defects in the visual field on the problems of medical diagnosis is seen in the case of lateral homonymous hemianopsia.

Optic Neuritis.—Routine examination of every case of disease of the nervous system with the ophthalmoscope should be made a part of every examination. A patient may have a well marked optic neuritis without being aware of any subjective visual symptom, as there may be no perceptible falling off in the visual acuteness, or at least without its being appreciable to the patient. Nor should one examination suffice.

Double optic neuritis is one of the most frequent symptoms of cerebral disease. Out of the twenty-four consecutive cases examined by me in the Glasgow Western Infirmary, I found neuritis of more or less intensity present in thirteen. The two cerebral conditions most frequently associated with optic neuritis are cerebral tumors and cerebral meningitis. Out of eighteen consecutive cases of cerebral tumor I found double optic neuritis present in ten. Most statistics give a much more frequent occurrence of optic neuritis, and Sir W. Gowers says that in his own experience neuritis occurs in about four-fifths of the cases of cerebral tumor. Sometimes optic neuritis may be amongst the very earliest symptoms of intracranial tumor. Next to cerebral tumor, optic neuritis is most frequently associated with meningitis, and in these cases, often very insidious at their onset, the recognition of optic neuritis is often the first indubitable symptom of intracranial disease.

Hyperemia of Optic Discs.—Apart from optic neuritis, however, there is another condition, not so well known, which is frequently a valuable aid to the early diagnosis of meningitis,

viz., hyperemia of the optic discs and distention of the veins. The color of the optic discs in conditions of health is very variable, and there is no strictly normal standard. In one patient the discs may be very pale, and in another distinctly pinkish, and yet this may be the normal character of each. When the hyperemia is slight, its pathologic character can be recognized only by the fact of its having developed under observation.

If the discs are observed to become more hyperemic, as evidenced by the increased redness, or by the fact that a large number of previously invisible little vessels become visible upon the disc, then this is a sign of great significance, and particularly if this hyperemia of the disc is accompanied by distention of the retinal veins. Hyperemia of the discs and neuritis are much more frequent accompaniments of the meningitis at the base than at the vertex, and hence these symptoms are met with most frequently in tubercular meningitis.

Atrophy of the Optic Nerves.—Atrophy of the optic nerves is so frequently associated with degenerative disease of the central nervous system, that in every case of optic atrophy the patient's reflexes ought to be examined very carefully, with a view to ascertaining their condition. The two diseases with which it is most frequently met are locomotor ataxia and disseminated sclerosis. If the patient's knee jerks are examined and found to be absent, the probability is the case is one of locomotor ataxia, but if they are exaggerated, and especially if accompanied by ankle clonus, the case is probably one of disseminated sclerosis. It is a matter of clinical observation that when the eye symptoms appear early in locomotor ataxia, the spinal symptoms are exceedingly slow in development, and even when they do appear, they seldom manifest the intensity met with in other cases. Next to tabes, disseminated sclerosis is the nervous disease most frequently associated with optic atrophy. Here also the optic atrophy is frequently an early symptom, occurring long before the muscular tremors and other characteristic symptoms appear. In the early stage of disseminated sclerosis there is often great difficulty in determining as to whether the initial symptoms, often of a transitory character, are hysterical or due to organic disease. The recognition of atrophic changes in the optic discs is often, therefore, most helpful in enabling the physician to arrive at a correct diagnosis, even at an early period of the disease.

N. M. B.

Colobomata of the Eye. (Continued.)

Hird, R. B. (*Ophthalmic Review*, November, 1912). Coloboma of the ciliary body was not noticed in any of the author's cases, although he would not say that there was no abnormality of the ciliary body in any of them.

The ciliary body has been shown to take place in the abnormality, and seeing that the iris and ciliary are both developed from the same mass of mesoblast, this is not to be wondered at.

Coloboma of the Choroid and Retina.—These must be considered together, owing to the intimate way they are associated. This condition of coloboma of the choroid and retina is commonly present with coloboma of the iris, but may occur alone. It may vary in size and shape. It may for instance involve the disc and extend towards the periphery in an ever widening area until it is lost in the region of the ciliary processes, or there may be present, in the line of the fetal cleft, an area of oval shape in the midst of apparently normal tissue. They can all be explained if it is considered that the defect is due to an abnormal adhesion of the retina to the mesoblast, so that when this abnormal adhesion takes place before the retinal fissure is closed, the coloboma is devoid of a covering of retina, and an absolute scotoma exists, whereas when it occurs after the closure of the fissure, the retina is everywhere present, and there is no scotoma.

Macular Colobomata.—This is the term given to an atypical coloboma situated at the macula. They are usually horizontally oval with sharply defined pigmented margins, and blood vessels from the retinal or ciliary arteries may be present. They are often ectactic, and so myopia is a frequent occurrence. The condition may be bilateral.

Colobomata at the Optic Nerve Entrance.—Coats calls our attention to two points to be observed: (a) Relation of the intervaginal space to the ectasia. A coloboma of the nerve will show an ectasia related to the inner or pial portion, whereas coloboma of the choroid will present an ectasia related to the outer or dural portion. (b) Absence of central vessels or atypical development. This does not mean that there is a coloboma of the nerve, for the cleft may have closed properly and the nerve be normal, the blood vessels being left out. On

the other hand, the presence of vessels in the nerve does not exclude coloboma, as the cleft may have failed to close.

As he says, it is really impossible to draw any hard and fast distinction between coloboma of the nerve and coloboma of the adjacent choroid, and indeed the two occur in combination. He divides the cases into three groups, as follows:

1. Those in which the lesion is a coloboma of the choroid beneath the nerve, the nerve itself being normal and only sharing passively in the deformity.

2. Those in which the lesion is a coloboma of the choroid and nerve.

3. Those in which the lesion is a coloboma of the nerve alone, the adjacent choroid being normal.

The appearances of coloboma at the optic disc may vary considerably. Usually there is enlargement of the disc and its typical character may be entirely lost, as was the case in some of my examples. The surface of the coloboma is generally white, and there may be partial or total ectasia of the surface.

Caspar has divided the arrangement of the vessels into three groups:

1. All the vessels emerge from the lower part of the pseudodisc, even those which subsequently turn upwards.

2. They emerge at or a little above the center and are nearly normally arranged.

3. The vessels appear at the edges around the whole circumference.

Colobomata of the Vitreous.—I have no experience of this condition. Some cases have been reported in which there has been indentation in the lower part of the vitreous, the cleft being filled with vascular connective tissue.

Colobomata of the Lens.—Whether coloboma of the lens is as rare as it is thought to be, I cannot say, but as it consists of an irregularity of the border, and this, when not marked, can only be seen when the pupil is fully dilated, there must be quite a number of cases, of the slighter type at any rate, that go undetected.

Various explanations have been forthcoming to explain the cause of coloboma of the lens, such as deficiency in nutrition from maldevelopment of the vascular sheath; absence of suspensory ligament at the site of the coloboma, which in conse-

quence did not exert any traction on the developing lens; most important is Hess's view that the vessels in the vascular sheath persisted too long and so prevented the growth of the lens locally by pressure. This is made possible by the fact that the vascular sheath does not disappear until late in fetal life.

Personally I believe that colobomata of the eye are due to some faulty development, and would advance the following in support of this:

1. There is no doubt that heredity plays an important part. Nothing more need be said, after the tables I have reproduced. Is it likely that a condition, handed down from generation to generation and always affecting an eye in a similar manner, is due to an inflammatory origin? von Hippel's experiments support this, for he was able to breed rabbits from a colobomatous parent and obtained the defect in twenty-three out of one hundred and twelve eyes. Microscopic investigation entirely favored the theory of maldevelopment. There were no signs of any inflammatory condition.

2. The microscopic evidence, as just stated and quoted above, does not support the theory of inflammation.

3. Coloboma of the lens does not appear to offer any reasonable explanation from an inflammatory point of view.

4. The presence of other congenital defects so often found in these cases strengthens the supposition that they too owe their origin to an error of development. N. M. B.

Ganglionic Glioneuroma of the Optic Nerve.

Ruhland, G. C. (*Jour. Amer. Med. Ass'n*, February 1, 1913). Ganglionic glioneuroma belongs to the rarer forms of nerve tissue tumors, and is found most commonly in the central nervous system and cord. The following case is of special interest, on account of the unusual location and evolution of the tumor:

The patient, a girl, first began to show evidences of eye trouble at the age of six. At the age of eight she contracted scarlet fever with rapidly developing exophthalmos and complete blindness of the eye. An enucleation was done and an oblong tumor, 3 cm. in length, and 1.5 cm. in width, was found occupying the optic nerve. Microscopic examination showed neuroglia tissue forced apart by hemorrhage and edema, with typical ganglionic cells and nerve fibers. The eyeball was not

involved. The tumor was undoubtedly congenital in origin and represents misplaced nerve tissue. Its growth was slow until the febrile condition of the scarlet fever with its accompanying hyperemia stimulated the tumor into an active growth. It is histologically a benign growth and there has been no return during a period of one and one-half years. E. S. T.

A Study in Dextrophoria.

Valk, Francis, New York (*Ophthalmic Record*, December, 1912), asks whether we may not have an anatomic condition of the lateral moving muscles that tends to turn each eye to the right or left. He answers this question in the affirmative, and asserts that the tendency to turn the eyes to the right, to which he gives the name of dextrophoria, is not uncommon. Less frequently sinistrophoria may occur.

He lays this condition to an increased or decreased development of the internus or externus respectively, and is not able to explain the essential cause, but believes it to be congenital.

Nearly all cases of squint that are corrected by glasses will be found to have dextrophoria.

For the diagnosis of this condition the routine methods of examination will not suffice, and the tropometer of Stevens, "rightly used," is the only method by which the diagnosis can be made. To these conditions Valk lays some of the occasional failures in the operative correction of strabismus.

In two thousand cases of refraction from his private records of the last six years, dextrophoria and sinistrophoria occurred fifty times in connection with heterophoria, and also in many cases of heterotropia.

In ordering prisms, Valk occasionally orders base in over one eye, base out over the other, with good results.

He refers to the value of the tucking operation first described by him in 1895.

Report of Case of Steel Passing Through Eyeball Into the Orbit.

Kreber, Edward E., Oelwein, Iowa (*Ophthalmic Record*, December, 1912), reports a case in which a piece of steel, 5 mm. long and 2 mm. wide, passed completely through the eyeball into the orbit, and lodged about 6 mm. to the nasal side of the nerve head, close to the globe. Enucleation was necessary. C. S. D.

The Technic of Advancement.

Elschnig, A., Prag (*Ophthalmic Record*, December, 1912). Exact fixation to the sclera is the most necessary requisite of the perfect advancement.

Elschnig disapproves of Denig's proposal to carry the suture through the corneoscleral margin into the anterior chamber. He does not believe that exact fixation can be secured by the now almost universal method of passing the suture through the superficial scleral lamellæ.

Elschnig uses one suture which fixes the muscle to the corneal margin, and two additional sutures which are carried through the conjunctiva and episclera to the upper and lower edges respectively of the muscle. These are then carried through the superficial sclera and through the fan-shaped insertions of the superior and inferior recti tendons.

The advantage of this triple fixation is that the muscle is securely fixed, and a binocular bandage is necessary for only a short time, twelve to twenty-four hours.

Elschnig avoids resection of the muscle, except in cases of paralytic squint. He does not believe that a mathematic regulation can be obtained by exact advancement or graduated tenotomy. G. S. D.

Trachoma and Its Surgical Treatment.

Fox, L. Webster, Philadelphia (*Ophthalmic Record*, December, 1912), lauds grattage in the more chronic and obstinate cases of trachoma. He performs it after the method used by Darier. The conjunctiva is first scarified with a three-bladed scalpel, and is then scrubbed with a tooth brush steeped in corrosive sublimate solution of 1 to 100. Soft gelatinous granulations are treated by rubbing with gauze. G. S. D.

A Pupillary Disc for the Correction of Spheric Aberration.

Mason, Albert B., Atlanta (*Ophthalmic Record*, December, 1912). To correct the spheric aberration present when the pupil is dilated with a cycloplegic, Mason has devised a pupillary disc which may be used in the trial frame. This disc contains openings 2, 3, 4, 5 and 6 mm. in diameter, arranged so that any one of them can be centered over the opening on the slide. G. S. D.

A Case of Macular Hole Due to Traumatism.

Blake, Eugene M., New Haven (*Ophthalmic Record,* December, 1912). Patient, a man aged 52 years, had been struck in the left eye with a baseball. Two days later there was seen in the region of the macula lutea a sharply defined, bright red area of about one-third the diameter of the disc. The edges of the spot were slightly wavy, and in the depths of the red area were three small white dots, probably sclera. Vision: fingers at fifteen feet. Field of vision normal, except for scotoma corresponding to the defect above described.

G. S. D.

A Case of Retrobulbar Neuritis of Toxemic Origin.

Allport, Frank, Chicago (*Ophthalmic Record,* December, 1912), describes an acute retrobulbar neuritis in a boy aged 18 years, suffering from catarrhal jaundice, and lays the eye condition to intestinal toxemia. G. S. D.

Migratory Ophthalmia Followed by Recovery of Useful Vision.

Fisher, W. A., Chicago (*Ophthalmic Record,* December, 1912). Sympathetic disease in a boy about six years old. Right eye was injured by a piece of copper. Left eye became affected about four weeks after. Developed a plastic iritis. The injured eye was removed. Iridectomy and lens extraction, followed later by iridectomy, after Ziegler, was performed and resulted in a final vision of 20/20. G. S. D.

A Case of Unusual Atrophy of the Choroid.

Chance, Burton, Philadelphia (*Ophthalmic Record,* January, 1913). Patient showed two distinct and marked areas of choroidal atrophy of a peculiar type. Picture suggested three optic discs lying on a line horizontally. About 1 P. D. from the papilla temporally lay the first rounded area of choroidal atrophy, bordered by pigment, and showing pigment flecks on its scleral surface. One P. D. to the outer side of this was a second area of the same type.

Chance is inclined to regard these areas as the result of a choroiditis in late fetal or early infantile life, not unlikely produced by emboli invading the choriocapillaris. G. S. D.

Dentistry and Optometry—A Parallel.

Crisp, William H., Denver (*Ophthalmic Record*, January, 1913), likens the optometry situation to that which previously existed in dentistry. He favors antegraduate specialization in medicine, or a special supplementary degree in ophthalmology after a series of postgraduate courses. G. S. D.

Atrophy of the Optic Nerve Following Injection of Olive Oil and Lanolin for the Removal of Wrinkles.

Fisher, W. A., Chicago (*Ophthalmic Record*, January, 1913). An injection of olive oil and lanolin was followed in five days by the loss of vision in the left eye, and from that time the blindness was complete. The history suggested an acute retrobulbar neuritis. Fundus examination showed optic atrophy.

Fisher states that when injections are made near the orbit for cosmetic effect, pressure should be made at the inner side of the orbit at the time of injection and for some time afterwards. G. S. D.

A Case of Injury in Which Six Pieces of Steel Were Discovered in an Enucleated Eye, Only One Piece Being Found by the X-Ray.

Allport, Frank, Chicago (*Ophthalmic Record*, January, 1913). The principal features of this case are well described by the title. The eye was enucleated. G. S. D.

Retinal Changes in Adolescents.

Knapp, Arnold, New York (*Archives of Ophthalmology*, January, 1913), describes four cases showing changes in the retinæ of young adults associated with lesions in the retinal veins. The picture suggests changes following intraocular hemorrhage, and are sometimes confined to the retina and at other times invade the vitreous, where they may produce a proliferating retinitis and be followed by detachment.

When extensive changes of this nature are found in one eye, it is of importance to examine the other to see if a similar process may not be in its infancy there.

The primary pathologic change has been found to take place in the walls of the retinal veins.

A number of papers describing the retinal changes of this

nature have been published in the last few years. Axenfeld and Stock speak of them as recurring hemorrhages in the tuberculous. Knapp regards the tuberculous origin as probable.

Tuberculin treatment, on the whole, seems to be the most successful. In one of Knapp's cases good results were obtained; a second is still under treatment; while in two there was no improvement. G. S. D.

Eye Troubles Caused by the Use of Hair Dyes.

Fernandez, Juan Santos, Havana (*Archives of Ophthalmology*, January, 1913). It seems probable that diseases of the eye may be occasioned by dyeing of the hair, although the proportion of eye troubles occurring in this connection is very small. The effects are due in most cases to the coloring substance used and to the susceptibility of the user.

The usual picture is edema of the eyelids and chemosis. In most of the cases observed by Santos Fernandez the vision was not impaired.

He concludes that all hair dyes in use at present are more or less toxic in effect. There are two kinds of injurious effects, inflammatory and toxic. The eyes alone may be affected. The most dangerous preparations are those containing anilin derivatives. G. S. D.

Peribulbar Implantation Cyst After Removal of Staphyloma of Cornea.

Samuels, Bernard, New York (*Archives of Ophthalmology*, January, 1913). Patient, male, 30 years old, came to hospital with a staphyloma involving three-fourths of the cornea. It was excised and the free edges of the sclera drawn together.

Three years later a cyst-like body occupied the space formerly taken up by the eyeball. The remnants of the eye were removed, and a pathologic examination showed a cyst lined with epithelium which entirely surrounded the shrunken eyeball.

Samuels regards it as an implantation cyst, and believes that great care should be taken to suture accurately all wounds in the conjunctiva. G. S. D.

Calcareous Degeneration of the Cornea and Lens Capsule.

Tooke, Frederick, Montreal (*Archives of Ophthalmology*, January, 1913). Tooke's case presented a round, dense scar of the cornea, completely covering the pupillary area. Tension was raised, and light perception absent. The eyeball was enucleated on account of pain and inflammation.

The pathologic examination showed large irregular masses of lime salts in the cornea. In attempting to cut the lens it cracked like an egg shell and the fluid contents escaped. There remained a covering which was white in color, with a regular and smooth surface. It proved to be calcium carbonate.

Tooke regards the condition of the lens capsule as unique, although partial calcification is met with in old anterior capsular cataracts. Condition of the lens and of the cornea was not to be confounded with that of actual bone formation. Condition found is held to be a primary degenerative process, similar to the formation of vesical or renal calculi. G. S. D.

Short Clinical Accounts With Microscopic Demonstrations of Two Cases of Tumor of the Optic Nerve.

Sattler, Robert, Cincinnati (*Archives of Ophthalmology*, January, 1913). Sattler's first case was a fibrosarcoma, apparently taking its origin from the dura mater and surrounding the optic nerve.

The second tumor occurred in the orbit of a boy of four years, and was accompanied by exophthalmus. It was removed without resection of the outer orbital wall. It proved to be an encapsulated, hard, egg-shaped mass, fully one inch long. It was necessary to remove the globe several days later. The pathologic report showed a primary intradural fibrosarcoma of the optic nerve. G. S. D.

The Clinical Course of Conjunctival Affections Associated With Socalled Trachoma Bodies.

Cohen, Martin, New York (*Archives of Ophthalmology*, January, 1913). Trachoma bodies were found in cases of trachoma in four types: (a) Hypertrophic. (b) Papillary. (c) Follicular. (d) Atrophic or cicatricial. Also in cases of nongonorrheal blennorrhea neonatorum, and in gonorrheal blennorrhea in young girls.

In the trachoma cases the infection was of a rather acute type. The socalled trachoma bodies were present for periods varying from two to nine months. Usual time required for resumption of a normal appearance was three or four months.

In the nongonorrheal blennorrhea neonatorum, trachoma bodies were found from four days to two weeks after birth. The course resembled that of mild cases of gonorrheal conjunctivitis. The conjunctiva returned to normal within three or four months.

In gonorrheal blennorrhea of young girls, the appearance of gonococci and trachoma bodies were irregular, one variety being present at one examination while the other might be present with the next, and occasionally both were found. The socalled trachoma bodies persisted even after the cure of the gonorrheal infection.

The conjunctiva became normal in from three to four months, but showed some congestion two and a half years later in several. G. S. D.

On Acquired Retraction Movements of the Eyes.

Salus, Robert, Prague (*Archives of Ophthalmology*, January, 1913). Retraction movements of the eye may be due to different causes. The congenital form is not at all uncommon and is caused by purely muscular anomaly, such as either a congenital aplasia of the external rectus, or a far posterior insertion of the internus.

Acquired retraction movements are much less common, and may be divided into four groups:

1. Comparatively common. Cicatricial adhesions following inflammatory processes or injury of the muscles in the orbit, usually combined with enophthalmos and restriction of mobility.

2. Cases in which psychic emotions cause reflex contractions of the ocular muscles with short retraction movements. Salus has often observed retraction, especially during the removal of foreign bodies from the cornea. This retraction is momentary and spasmodic, and 2 to 3 mm. in extent.

3. An obscure group in which enophthalmos apparently occurs when the lids are drawn apart.

4. In this group lie those cases of retraction movements in which the cause is to be found, not in abnormal musculature, but in the central nervous system.

He discusses a case reported by Koerber, in which divergent strabismus developed and a paresis of the internal rectus superior oblique. On attempting to look upward there were retraction movements of both eyes and other signs. Koerber supposed that the condition was due to a disseminate sclerosis or chronic polioencephalitis superior.

Second case of Koerber's developed paresis of several branches of the third nerve following influenza. When he looked upwards there were marked retraction movements of the eyes. Retraction movements were due, he believed, to an abnormally increased innervation of the recti, which occurred when the patient attempted to innervate the paretic elevator of the eye.

Salus reports a third case. Man, 25 years old, developed somnolent condition following some months of severe headache. Vomiting had been present. Left palpebral fissure was wider than right. On attempting to look in any direction there were marked retraction movements of both globes, spasmodic and jerky. Choked disc was present. Pathologic examination disclosed a cysticercus in the region of the fourth ventricle. Seat of the lesion was undoubtedly in the floor of the aqueduct of Sylvius. G. S. D.

On the Chemistry of Senile Cataract.

Jess, Adolf, Würzburg (*Archives of Ophthalmology*, January, 1913), alludes to the researches of Reiss, who examined cataractous lenses by means of the cystein reaction.

In the normal lens there was no difference in the behavior of the peripheral and of the central layers to this reaction.

In senile cataract the reaction disappeared entirely or in part.

Traumatic cataract behaved like a normal lens.

In hypermature cataract, the reaction was entirely wanting. In immature cataract the cortex nearly always reacted plainly, and even some cases of the nucleus.

The age of the patient had no bearing on the reaction.

Jess confirms Reiss's results. He is also able to confirm Morner's statement of the presence of a considerable portion of insoluble albumin in the lens.

The details of the various processes used are to be found in his article. G. S. D.

The Control of Ophthalmia Neonatorum in Massachusetts

Cheney, Frederick E., Boston (*Boston Medical and Surgical Journal,* January 23, 1913). Under the Massachusetts law, if conjunctivitis develops in an infant at any time during the first two weeks after birth, the physician or attendant must report within six hours to the Board of Health. The state furnishes each physician with a prophylactic (nitrate of silver 1 per cent). An explanation of the ophthalmia neonatorum reporting law is printed on the blanks for birth returns. During the last two years there have been a number of prosecutions of physicians and midwives for nonobservance of the law.

Cheney urges laws requiring that all cases of ophthalmia neonatorum be placed under the care, or at least the supervision, of an oculist within a certain time after the symptoms of the disease are first noted, and also that literature on the subject of ophthalmia neonatorum be sent out regularly to medical men at three or even six month intervals for the next ten years. Also that a special notice to parents be sent immediately after the receipt of the notice of a birth to acquaint them with the dangers of ophthalmia neonatorum.

G. S. D.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

ALBERT C. SAUTTER, M. D.,

PHILADELPHIA.

MAX W. JACOBS, M. D.,

ST. LOUIS.

On the Anatomy of Acquired Luxation of the Lens and Its Sequelæ.

BURK, Kiel (*Graefe's Archiv. f. Ophthal.*, Vol. 83, Part 1), presents his views based on the clinical and anatomic study of ten cases.

He agrees with v. Michel that for a spontaneous or traumatic luxation to occur into the anterior chamber, a complete laceration of the zonula fibers is necessary. Burk's series includes three such cases. In one case of traumatic origin he found remains of the zonula fibers on both the anterior and posterior capsule. v. Michel and Ask never found zonular remains on the capsule in the cases they studied.

In two cases the writer observed a rare complication—a rotation of the lens in an arc of 180 degrees, the lenticular epithelium being directed posteriorly. Lenticular astigmatism due to rupture of zonula fibers is a frequent complication, or the lens may be distorted by the traction of scar tissue. Opacities usually are present, and in old cases there may be shrinkage of the lens cortex. A defect in the capsule was never observed.

He claims that luxation may be associated either with partial or complete laceration of the fibers or with no laceration; in the latter the luxation being the result of traction on the lens or fibers by scar tissue. Complete detachment of the fibers from the ciliary processes did not occur in the author's cases. Rolled-up fibers were seen only on the ciliary processes, never on the orbicularis. The true zonula (fibers between the processes and

lens) may be detached in its entire circumference. The fibers usually tear away at their insertion in the lens.

Concerning the etiology, positive conclusions cannot be drawn; however, the findings rather favor Arlt's (Dehnung) theory. Burk believes that rupture of the corneoscleral ring must be preceded by partial rupture of the zonula. In four cases with partial rupture of the zonula, the lens was dislocated down and out, the zonula rupture up and in, the region of the eye especially liable to rupture of the sclera.

In four cases there was excavation of the papilla and peripheral synechiæ, in one, peripheral synechiæ only. The anterior chamber was obliterated and the iris atrophic in two of these. One case was of interest because it showed a probable preglaucomatous state. There was no tension, but a chronic inflammation in the angle, which probably would have led to synechia formation in the course of time. In the causation of secondary glaucoma the exciting factor is probably irritation of the ciliary body by the lens or by traction on the zonula fibers.

He thinks it possible for the luxated lens to lead to choroidal changes. The fact that choroiditis in these cases is nearly always unilateral argues in favor of such a view. A. C. S.

Some Measurements Concerning the Diathermancy of the Human Eyeball, Its Media and the Upper Lid, With Remarks on the Biologic Action of Ultra-red.

Vogt, Aarau (*Graefe's Archiv. f. Ophthal.*, Vol. 83, Part 1), ends his article with the following summary:

In a human eye subjected to the radiation from a carbon filament lamp of 32 mk., only 3 per cent of the total number of rays reach the retina. Of the latter, less than 1 per cent penetrate the orbit.

Of the rays from the same light source impinging on the cornea, 20 to 25 per cent reach the anterior chamber. The iris, lens and vitreous are strongly absorptive. The sclera is as permeable as the cornea. The tarsal portion of the upper lid allows 6 per cent of the rays to reach the surface of the globe.

About four-fifths of the rays passing through the globe and its parts are invisible and belong to the ultra-red portion of the spectrum.

Glass (spectacle glass) protects only against the long ultra-red waves, but not against the penetrating short ultra-red waves.

A pupillary reaction cannot be obtained with ultra-red, but by illumination of the lids and anterior portion of the temporal orbital wall with incandescent lamps or sunlight.

The exacerbations in vernal catarrh may be attributed to thermic influences.

The number of penetrating short ultra-red waves emanating from an illuminant is directly dependent upon the temperature of the illuminant. Solid bodies heated to 500 or fewer degrees do not emit measurable radiation through the human ocular media.

A toxic action of the higher intensities of both the long (upon external ocular parts) and short (upon the iris) ultra-red waves has been experimentally proven. A. C. S.

Further Investigations Concerning the Pathogenesis of Hemostatic Glaucoma, and the Valve Action of the Sinoscleral Plate in the Etiology of Hemostatic Glaucoma.—Part 2.

Heerfordt, Copenhagen (*Graefe's Archiv. f. Ophthal.*, Vol. 83, Part 1), presents the results of further anatomic studies concerning the sinus vorticosus and the scleral canal and their relation to hemostatic (inflammatory) glaucoma. Thus anatomic examination of a glaucomatous eye in which hemostatic glaucoma had existed five to six months prior to enucleation, showed in a main branch of a vortex vein a valve-like constriction because of altered position of the sinoscleral plate occluding two-thirds of the opening into the scleral canal. In the main branch of a second vortex vein a similar valve occlusion occurred, almost completely shutting up the opening into the scleral canal. While these findings so far are limited to three venous branches in two eyes, he is convinced of the importance of the valve action of the sinoscleral plate in the etiology and symptomatology of hemostatic glaucoma. The article contains numerous drawings and several colored plates which add much to the value of the work A. C. S.

The Etiology of Phlyctenular Eye Disease.

Ruebert (*Klin. Monatsblätter für Augenheilkunde*, September, 1912). As a result of exhaustive experiments on rabbits and guinea pigs, the writer comes to the following conclusions: It is possible by instilling tuberculin or the toxins of staphylococcus pyogenes aureus into the conjunctival sacs of these

animals, to produce structures similar to phlyctens in the eyes of healthy animals which had previously been treated with tuberculin or inoculated with the tubercle bacillus. In view of the fact that bacteria have never been definitely demonstrated in these structures, it is reasonable to assume that they are the result of the action of metabolic products. General conditions, be they the "exudative diathesis" or "autointoxication," unless accompanied by tuberculosis, cannot apparently be blamed for the presence of these structures. Whether factors such as chemical substances, nasal disturbances, etc., can produce like effects, requires further investigation, but external causes alone apparently do not produce the picture known as recurrent phlyctenular conjunctivitis.

The conjunctivæ of tuberculous rabbits are very susceptible to the poisons used by Rubert, but guinea pigs were refractory as regards staphylococcus, and reacted but slightly to tuberculin. On the contrary, however, in guinea pigs, both tuberculous and nontuberculous, corneal opacities followed the instillation of the substances into the conjunctival sac. Perhaps this will lead to an understanding of the condition known as scrofulous keratitis, and may help explain the fact that pannus trachomatosus seems to occur largely in scrofulous persons. Rubert concludes that his experiments prove that the resistance of cornea and conjunctiva are lowered under the influence of the toxins of tuberculosis. M. W. J.

On the Pathologic Anatomy of the Lacrimal Caruncle.

Rados (*Klin. Monatsb. f. Augenh.*, September, 1912). This is a report of a case of soft fibroma of the caruncle in a man of 27 years. The growth had been noticed for three years. It is the fourth case reported, and, like its predecessors, was marked by gradual growth over a long period with sudden increase in size. Elschnig asserted that spontaneous hemorrhage is characteristic of this form of tumor, but none of the four cases reported here presented this feature. M. W. J.

Papillomata of the Limbus of the Cornea.

Rosenbach (*Klin. Monatsb. f. Augenh.*, August, 1912). This is a report of a number of cases of papilloma situated at the limbus corneæ, and the author seeks to impress the reader with the importance of histologic examination of such growths.

One of his cases showed papillomatous tissue on examination, and had a recurrence later which was carcinomatous.

M. W. J.

The Tubercle Bacillus in Parinaud's Conjunctivitis.

Moellers (*Deutsche med. Woch.*, 1912, No. 44; Abst. in *Woch. f. Ther. u. Hyg. des Auges.*, January 30, 1913) obtained pure cultures of human tubercle bacilli from two cases of Parinaud's conjunctivitis. In no case has the bovine tubercle bacillus been positively demonstrated. The writer is therefore inclined to ascribe the disease to infection by the human tubercle bacillus, though he considers infection by the bovine bacillus a possibility.

A. C. S.

Concerning Wormlike Twitchings of the Sphincter Pupillæ.

Sattler (*Klin. Monatsb. f. Augenh.*, September, 1912). The condition described by Münch in 1907 has been observed by Sattler, who noted that the worm-like writhings, although weak, are occasionally to be seen in normal eyes. The phenomenon is seen particularly in the diseases producing a sluggish or fixed pupil. Such sluggishness or fixedness may be of central origin, as in the case of cessation of the reflex light stimulus or other disturbance of the nerve paths. In the case reported recently by Hirschberg, the cause was of peripheral nature, as has occasionally been noted. Münch tried to explain the condition by saying that when the stimulus is weak, as in oblique illumination of low grade, the innervation impulses are transmitted only along certain fibers, but in two of Sattler's cases the writhing movements persisted in spite of undoubted amaurosis. Münch's other assumption, that the light stimulus which in healthy persons produces a general sphincter contraction, in cases of oculomotor paresis causes only the worm-like movements, is not confirmed by Sattler, who claims that the intensity of these movements ought to vary with the grade of light stimulus, if Münch's idea is correct and the findings were otherwise.

M. W. J.

Observations on the Work of Robert Hesse, "Contraction of the Pupil During Near-Vision."

Isakowitz (*Klin. Monatsbl. f. Augenh.*, August, 1912). Hesse claims that when an eye suffering with oculomotor paralysis fixes a near object, the other healthy eye turns out-

wards (secondary deviation), and the pupil of the deviating eye contracts. Hesse thinks this contraction is due to the influence of the accommodative impulse. Isakowitz thinks a convergence impulse may still be at work in producing the contraction and that Hesse's experiment is not conclusive. Isakowitz quotes an experiment of Otto Weiss, published in 1904, to refute another experience of Hesse, in which the latter seeks again to prove his contention that pupillary contraction is brought about by the accommodative impulse alone. Isakowitz believes that accommodation and convergence, acting together, cause contraction of the pupil. M. W. J.

Seven Cases of Pupillary Membrane.

Zubiria, Barcelona (*Arch. de Oftalm.*, August, 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, November 28, 1912), cannot accept the view attributing persistent pupillary membrane to intrauterine inflammation. A. C. S.

The Eye Movements Originating in the Auditory Apparatus (Labyrinthine Ophthalmostatics).

Bartels (*Klin. Monatsbl. f. Augenh.*, August, 1912). Recent studies in nystagmus by otologists, and efforts on the part or oculists to utilize the eye movements as an aid in the diagnosis of the location of nerve lesions, prompt Bartels to review the recent work in this direction. He mentions briefly the earliest work by Purkinje and others, the investigations of Jansen and Urbantschitsch, as well as the most recent activity of Bárány. After a sketch of the physiologic phenomena and a classification of nystagmus, he describes briefly how far our present knowledge has been of practical use. As Bartels has given the subject much attention in the past, he has a grasp of the subject which could not be expected in a mere reviewer. It is a valuable paper, but possibly a bit too concentrated for the ophthalmologist who has not kept in touch with the recent advances in the study of nystagmus by otologists. M. W. J.

Deafness in Sympathetic Ophthalmia.

Komoto (*Klin. Monatsb. f. Augenh.*, August, 1912) reports a case of deafness complicating an attack of sympathetic ophthalmia, which was pronounced cerebral in character by the consulting aurist. As a result of observation of this case

and a study of the literature, Komoto comes to the conclusion that deafness in this disease is of cerebral origin, is usually bilateral, of equal intensity on the two sides, and is generally without prodromes. The deafness appears within very wide limits; one case developed immediately with the sympathetic ophthalmia, others many months later. According to the writer, the prognosis is bad, but he states that enucleation seems probably to have a good effect. After a discussion of Deutschman's theory of sympathetic ophthalmia, and a consideration of intoxication as an explanation of the deafness, Komoto suggests that the theory of metastasis offers the simplest explanation. He also suggests the possibility of a purely toxic deafness which might follow treatment of sympathetic ophthalmia with salicylates or salvarsan. M. W. J.

Elephantiasis of the Lid Following Suppuration of Neighboring Lymph Glands.

Roessler (*Klin. Monatsb. f. Augenh.*, September, 1912) describes a case of swelling of the left upper lid which microscopically presented the picture of pachydermia lymphangiectatica. The patient, a young man of 18, had had a slight pustular infection over the left zygoma three years before, followed by an infection of the parotid on the same side. A blow over the parotid was a factor in producing the infection. The gland was repeatedly incised. The infection was followed by the lid swelling, which persisted for nearly three years, when Roessler excised a portion of the upper lid so that the patient regained sufficient control to raise the lid border to the middle of the cornea. Up to the time of the excision the upper lid was immovable. M. W. J.

Hematoma of the Eyelid Complicating the Removal of Nasal Polyps.

Jannulis (*Klin. ther. Woch.*, 1912, No. 45; Abst. in *Woch. f. Ther. u. Hyg. des Auges*). During an operation for the removal of nasal polyps a rather profuse hemorrhage occurred, necessitating tamponage. Soon afterwards the patient experienced pain in the eye, associated with swelling of the upper lid, going on to a complete hematoma. He attributes the complication probably to retrograde stasis because of the tamponage in a severed anomalous vein. The subsequent history was uneventful. A. C. S.

The Simultaneous Occurrence of Two Chancres on the Face.

Rollet and Genet (*Lyon. med.*, 1912, No. 42; Abst. in *Woch. f. Ther. u. Hyg. des Auges,* December 5, 1912) report a case of chancre involving the whole lower lid, associated with a chancre on the chin on the same side. Spirochetes were obtained from both lesions. A. C. S.

Ocular Lesions Caused by Observation of the Solar Eclipse April 17, 1912.

Hoppe (*Muench. med. Woch.*, 1912, No. 45; Abst. in *Woch. f. Ther. u. Hyg. des Auges,* December 19, 1912) reports seven cases in which more or less serious ocular injury occurred because of prolonged observation of a solar eclipse; in a few, in spite of protective measures. All were blonde, with light colored irides. In five cases both eyes were affected. In one there was conjunctival injection with lacrimation.

The fundus changes confined themselves to the macular region, consisting of a circular or vertical oval yellowish orange disc surrounded by a darker red brown zone. Scintillation of the disc was rather frequently observed.

Four patients exhibited a positive absolute scotoma, two a sharply defined circular defect in the lower right hand portion of the scotoma. There was, of course, impairment of central vision, also marked retinal fatigue enduring some weeks. Foerster's photometer revealed decreased sensibility in the central retina. Metamorphopsia within the scotoma occurred in four patients. In the region of the scotoma the color sense was entirely lost, but fully regained in two weeks. While an ideal restoration of the retinal functions did not occur, useful vision was regained in every case within six weeks after exposure. A. C. S.

Injuries to the Anterior Ocular Segment Caused by Observation of a Solar Eclipse.

Kaz, St. Petersburg (*Woch. f. Ther. u. Hyg. des Auges,* December 5, 1912), reports a case of transient paresis of the sphincter iridis, a case of partial cataract, and a case of keratoconjunctivitis following observation of an eclipse of the sun. The first case occurred in a hypermetrope, and he thinks prolonged ciliary spasm responsible for the paresis.

A moderate astigmatic error was present in the second

case. In neither case were fundus changes observed. He refers to Lasarew's cases, in which macular hole formation occurred only in emmetropic eyes, and to the possible influence of refraction upon the intensity of the macular lesion, a thought suggested by Tschemolossow. Perhaps the ametrope is more liable to injuries of the anterior segment because of decreased macular irritation which encourages prolonged exposure. It was impossible to determine the refraction in the third case on account of corneal opacities. A. C. S.

Eye Injuries Produced by Blank Cartridges.

Van der Hoeve (*Klin. Monatsb. f. Augenh.*, August, 1912). Blank cartridges, according to van der Hoeve, are extremely dangerous within a six meter distance. At this distance he found infections of the cornea a positive fact, and records cases of perforation of the eyeball by portions of such missiles at a distance of four meters. M. W. J.

Concerning Late Infection in Ophthalmia Neonatorum.

Crede-Hoerper (*Muench. med. Woch.*, 1913, No. 1; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, January 23, 1913). While in the newborn late infection of the conjunctiva by the gonococcus is usually due to indirect transference of the infective organism, in some cases the writer thinks infection occurs in a different manner, his views being based on a study of two patients who immediately after birth were taken from their mothers. In these cases there occurred infection of the lid glands (Meibomian), followed by suppuration and rupture of the infectious contents into the conjunctival sac, with subsequent involvement of the conjunctiva. A. C. S.

A Case of Congenital Luetic Parenchymatous Keratitis After Linear Extraction.

Lacomete (*Ann. d'Ocul.*, September, 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, December 12, 1912) reports a case of posttraumatic parenchymatous keratitis from the Fuchs clinic. A linear operation for the removal of a cortical cataract had been performed in a fifteen-year-old girl; three days later a parenchymatous keratitis developed at the site of the incision and subsequently spread over the whole cornea. There was a positive luetic history with positive Wassermann.

The case complied with Terrien's postulates, which demand absolute integrity of the concerned tissue before the traumatism, the absence of any objective ocular lesion prior to the trauma and the occurrence of a positive traumatism, followed soon after by the development of the affection. A. C. S.

Ophthalmia Nodosa.

Dalmer (*Zeit. f. Augenh.*, Vol. 28, Part 4: Abst. in *Woch. f. Ther. u. Hyg. des Auges*, December 19, 1912) reports two cases of ocular injury by caterpillar hairs. In one the hairs became lodged in the iris tissue. A. C. S.

Symblepharon and Ulcer of the Cornea.

Brueckner (*Zeit. f. Augenh.*, Vol. 27, Part 6; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, November 28, 1912) reports four cases of symblepharon following ulcer of the cornea. The causative factors include orbital cellulitis, measles, diplococcic infection, and erysipelas. In obstinate cases the writer suggests artificial symblepharon instead of conjunctival plastic, the subsequent division of the adhesion being attended with little difficulty, the only disadvantage being, of course, the exclusion of the ulcer from observation. A. C. S.

Metastatic Opthalmia Following Extraction of a Tooth.

Jampolsky (*Wiener klin. Woch.*, 1912, No. 35; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, December 12, 1912). Five days after extraction of a lower molar in an eleven-year-old girl, a grayish yellow reflex was observed in the pupil of the eye on the same side, this condition being preceded by fever and vomiting of two days' duration. On the sixth day herpes of the lip, catarrhal angina and suppurative iritis (with hypopyon); no socket infection. In spite of treatment, phthisis bulbi resulted. Pyemia followed by embolic metastasis to the choroid or retina, the writer considers as the etiologic explanation. A. C. S.

Two Cases of Echinococcus of the Orbit.

Cosmettatos (*Klin. Monatsb. f. Augenh.*, September, 1912). While the echinococcus is very frequently met with in Athens, where Cosmettatos resides, the author's two cases are of ex-

ceptional interest, viz., two large echinococcus cysts of the orbit, one of which was of at least six years' standing, and of especial interest because it was attached to the bony wall of the orbit. M. W. J.

Atypical Keratitis—Exogenous Infection of the Cornea Associated With Gummata of the Iris Followed by Cyclitis of the Fellow Eye (Parasympathetic Ophthalmia).

Morax (*Ann. d'Ocul.*, October, 1912: Abst. in *Woch. f. Ther. u. Hyg. des Auges*, January 23, 1913) reports a case in which after injury to the cornea by a straw halm there ensued a small central corneal ulceration, followed by the appearance of iris nodules, resembling gummata of the iris. Three months later, cyclitis with descemetitis in the fellow eye. Inflammation finally subsided in both eyes, leaving the patient with some impairment of vision due to corneal opacities. Sporotrichosis, tuberculosis and syphilis could be excluded. Morax considers the affection in the fellow eye a parasympathetic inflammation induced by hematogenous transference of the infection. A. C. S.

Echinococcus Cyst in the Orbit.

Sleraxdi (*Archiv. de Oftalm. Mexico*, September, 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, December 12, 1912) reports a case in a forty-four-year-old man, the first symptom being ptosis, noticed nine years previous to his admission to the clinic. On admission there was ptosis, exophthalmos, a fluctuating mass behind the eye, and perforating ulcer of the cornea with iris prolapse. Puncture showed scolices. Incision and irrigation with sublimate. Five days later extrusion of the sac, followed by a speedy cure. Subsequent ptosis operation. The conservative treatment in this class of cases thus receives further support. A. C. S.

Unilateral Exophthalmos in Basedow's Disease.

Worms and Hamant (*Gas. des Hop.*, 1912, No. 70, and *Wien. klin. Woch.*, 1912, No. 37; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, December 12, 1912) report two such cases, making the number so far reported 114. v. Graefe and Stellwagon's sign were present. In these cases the general symptoms are apt to be less severe than in Basedow's disease with bilateral exophthalmos. A. C. S.

Retinochoroiditis (Edmund Jensen).

Petersen (*Klin. Monatsb. f. Augenh.*, August, 1912) reviews fifteen cases reported in the literature as similar to the condition described by Edmund Jensen, in 1908, as retinochoroiditis juxtapapillaris, and brings out a number of facts which may eventually help in our understanding of the condition. He finds that the disease occurs between the ages of twenty and thirty-five, in otherwise healthy individuals, and is characterized by hazy vision, associated with a small cotton-like lesion, having a predilection for the papilla. In some cases a string-like opacity springing from the lesion has been noted. The visual fields show defects which are sharply defined and explained by Petersen as due to lesions in the nerve fiber layer. A striking feature of the disease is its proneness to recurrence in the vicinity of earlier lesions; but in the face of this the prognosis is good. Petersen considers this as evidence against the disease being of tubercular origin. Syphilis is apparently of no consequence in the etiology. Petersen comes to the conclusion that the disease has its seat in the retina, as the destruction in the choroid is not at all so severe as in disseminated choroiditis. The writer concedes, however, that the etiology is still very much in the dark, and will probably remain so until an opportunity arises to examine a case histologically. M. W. J.

Contribution to the Subject of Recognition of Tuberculous Changes in the Retina.

Rados (*Klin. Monatsbl. f. Augenh.*, September, 1912). The patient was a boy of ten years, whose left eye was involved. It became very painful after the process had persisted some time with seclusio and occlusio pupillæ. He died, one year after the enucleation, of meningitis tuberculosa. Iris and ciliary body were the starting points of the process, which then spread backwards along the retina, the choroid remaining practically normal. M. W. J.

Chorioretinitis Familiaris Hereditaria.

Lutz (*Anal. de Oftalm. Mexico*, August, 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, December 12, 1912). Chorioretinal disease occurred in four sisters of a family consisting of three brothers and six sisters. The parents were

healthy, there was no history of consanguinity, Wassermann negative, family history negative. Normal vision and fundus in parents and healthy brothers and sisters. The disease began between the tenth and twelfth years, and affected both eyes. Within a few months vision sank to 3/60—1/60. Fundus changes occurred only at the posterior pole, consisting of grayish or black pigmentation. The light sense was much impaired, and there was a central scotoma in each eye.

A. C. S.

Three Cases of Embolism of the Central Artery of the Retina Complicated With Pregnancy.

Teillas (*Ann. d'Ocul.*, September, 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, December 5, 1912) reports three typical cases of embolism of the central artery, which he attributes to blood changes occurring in the pregnant state. In each instance the ocular complication occurred in the last three months of pregnancy, at a time when blood changes are most pronounced. All other etiologic factors could be excluded.

A. C. S.

Forms of the Visual Field in Tabetic Ocular Nerve Atrophy.

Langenbeck (*Klin. Monatsb. f. Augenh.* August, 1912), as a result of a study of the visual fields of 130 tabetics, comes to the following conclusions:

There is no absolutely typical form of visual field in tabes.

We find most often peripheral defects, contraction of the color fields, and early loss of color perception throughout the field. Less often we find partial defects with well preserved function in the parts remaining.

The rarer cases with a central defect require repeated examination for the determination of a possible retrobulbar complication.

Hemianopic visual fields are not found in uncomplicated tabetic atrophy of the optic nerve.

M. W. J.

Enlargement of the Blind Spot (van der Hoeve's Symptom) and Central Scotoma in Disease of the Posterior Sinuses of the Nose.

Ruebel (*Klin. Monatsbl. f. Augenh.*, August, 1912) reports four cases in which the visual fields were carefully studied in relationship to the nasal condition of his patients. He wishes

to call attention and stimulate study of the condition described by van der Hoeve. His observations lead him to the conclusion that van der Hoeve's symptoms is not constantly present in affections of the sinuses behind the nose, but that it has real worth as a diagnostic aid. M. W. J.

Contribution to the Etiology of Bitemporal Hemianopsia With Especial Consideration of Hypophysis Disease.

Bogatsch (*Klin. Monatsb. f. Augenh.*, September, 1912). Recent interest in the connection between acromegaly and disease of the hypophysis dates from 1886, when Pierre Marie directed attention to the subject. Bogatsch found 315 cases of bitemporal hemianopsia in the literature, and adds thirty-four which he tabulates in detail. These thirty-four were carefully gone over by various specialists and a Wassermann test made. He found that in 50 per cent a positive or practically positive diagnosis of hypophysis disease could be made by means of operation, postmortem or Röentgen plate findings. Up to 1886 there are fifty-nine cases in the literature; in these the percentage of hypophysis disease is 5 per cent.

Comparison of these various statistics leads to the following results:

	Before 1886.	After 1886.
Hypophysis disease	about 5%	about 50%
No etiology	about 40%	about 13%

Bogatsch quotes Hirsch, who dwells on the importance of the three points: temporal hemianopsia, habitus of the patient, and Röentgen picture.

Regarding five cases of bitemporal hemianopsia in tabes, reported by Fuchs, who thought a lesion in the chiasm was at the bottom of the phenomenon, Bogatsch seeks to disprove the Vienna authority's assumption, by analyzing the cases of writers who have reported similar cases, and states that until such cases are examined histologically, the opinion of Fuchs cannot be accepted. M. W. J.

Acute Ethyl Alcohol Amblyopia.

Kaiser, Dresden (*Muench. med. Woch.*, 1912, No. 46; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, January 9, 1913), reports a case in a fifty-three-year-old man after an alcoholic debauch. Ocular examination showed equal pupils of moderate size, reacting to light and convergence. Fixation was preserved,

but there was inability to count fingers. The eye grounds were normal. No central or peripheral perception of colors. The following day vision had improved to counting fingers at one to one and a half meters, there was marked concentric contraction of the field, but no central scotomata. Ten days later vision in each eye was practically normal and the fields had also shown decided improvement. He attributes the condition to direct toxic lesion of the fibers of the optic nerve.

A. C. S.

A Case of Evulsio Nervi Optici.

Natanson (*Klin. Monatsb. f. Augenh.*, August, 1912). In this case the head of the optic nerve was torn from the eyeball and the nerve luxated to one side. The injury was produced by the patient falling on his cane. Salzmann first called the condition evulsio nervi optici. M. W. J.

Posterior Superficial Crossed Sclerotomy.

Wicherkiewicz (*Ann. d'Ocul.*, July, 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, November 28, 1912), after exposing the sclera, makes four to six parallel, meridional incisions each 10 to 12 mm. long, almost through the entire thickness of the sclera. Similar incisions are then made at right angles to these and the wound closed by two or three sutures. This operation is free from danger and indicated in simple glaucoma, hemorrhagic glaucoma and any glaucoma in which an anterior operation has proved unsuccessful. In keratoglobus, in hydrophthalmos, and in secondary glaucoma due to luxation of the lens into the vitreous, the operation is of distinct value. To obtain the best results the operated eye should be massaged during the following nine or ten days. A. C. S.

Remarks Concerning Enucleation in Phlegmonous Ophthalmitis.

Genet and Bussy (*Lyon med.*, 1912, No. 49; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, January 23, 1913) call attention to certain points in the evolution of phlegmonous ophthalmitis and to factors which may complicate enucleation in this affection. Thus, on account of adhesions between the sclera and Tenon's capsule, it is often impossible to luxate the globe forward after division of the tendons. In one case the entire posterior portion of the capsule had become adherent to the sclera, the capsule being thickened by fibrous tissue. Within this re-

gion there was a distended posterior ciliary vessel, but no perforation of the sclera. In other cases a serous exudate is found which escapes from the peritendinous spaces after incision of the conjunctiva. Infection of adjacent structures probably is effected through the lymph sheaths of the posterior ciliary vessels or nerves. Perforation of the sclera apparently does not occur. A third possibility is for the inflammation to break through the capsule and invade the orbital fat, probably also by way of the vessel sheaths. Pyogenic organisms, however, seem to remain behind. A. C. S.

Celluloid Film as Artificial Conjunctiva and Ocular Prothesis.

Kaz, St. Petersburg (*Woch. f. Ther. u. Hyg. des Auges*, January 2, 1913), describes a case of total ankylosymblepharon in which the introduction of celluloid film behind the lids acted very favorably, being followed by disappearance of granulations and enlargement of the cul-de-sac. The film was well borne by the eye. Subsequently he inserted a film prothesis, consisting of two layers of celluloid enclosing a piece of very fine silk upon which he had an iris sketched. The cosmetic result was a good one, as on account of the transparency of the film it was hard to tell that there was any scleral covering.

While subsequent suppuration necessitated removal of the prothesis, the case suggests three possible uses of the celluloid film: 1. As a corneal bandage in keratoectasia and staphyloma, as a substitute for Kuhnt's conjunctival plastic, as a means of separating a trachomatous pannus from the upper lid. 2. As a protection against symblepharon, by plain film protheses. 3. As a prothesis in total leucoma instead of tattooage.

A. C. S.

The Treatment of Impending Corneal Perforation.

Chalous (*Ann. d'Ocul.*, October, 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, January 16, 1913), in impending corneal perforation, recommends paracentesis at the limbus 4 to 5 mm. in extent, to be followed in twenty-four hours by separation of the wound margins and reopening of the chamber. This procedure is repeated daily. In the five cases he reports it had to be done at least five times. By this method complete cicatrization without ectasia results. The operation is not contraindicated in cases with marked infection of the conjunctiva.

A. C. S.

The Local Use of Neosalvarsan in the Eye.

Rosenmeyer, L. (*Muench. med. Woch.*, 1912, No. 45; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, December 12, 1912), administered neosalvarsan locally in a case of interstitial keratitis due to congenital lues. Treatment with Hg. had proved ineffectual. In one eye he introduced several grains of the powder, in the other instilled a few drops of a 2 per cent solution. Within two days clearing of the opacities, and in the eye treated with the solution, subsidence of inflammatory infiltration were noted. Continued use of atropin and neosalvarsan in one solution resulted in marked improvement.

A. C. S.

Extraction of a Copper Splinter From the Vitreous.

Haase (*Klin. Monatsb. f. Augenh.*, September, 1912). Hippel's recent paper on the same subject prompted Haase to report a case operated on in 1908 with good results up to date. He used a lamp fixed to his forehead and made a long meridional incision. A second splinter in the same eye was eventually cast out spontaneously. M. W. J.

Ophthalmologic Observations Concerning Puncture of the Corpus Callosum (Balkenstich).

Hessberg (*Berl. klin. Woch.*, 1912, No. 50; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, January 23, 1913), reports five cases of hydrocephalus and two cases of brain tumor in which puncture of the corpus callosum was performed. From a study of these cases and the literature he draws the following conclusions: Puncture of the corpus callosum is a comparatively simple cranial operation for the relief of increased intracranial pressure, even infants in general bearing up well under this treatment. There usually follows a decided lowering of tension, showing itself objectively in the writer's cases by a decrease in exophthalmos with improvement in the visual field and regression of the nerve swelling; subjectively by disappearance of headache and improvement in the general condition. In several cases of hydrocephalus the improvement was permanent, and in a few a cure seems to have resulted. The operation is less dangerous than a palliative trephinement, and not followed by cerebral hernia.

A. C. S.

Meningitis Following Enucleation for Panophthalmitis.

Jacqueau (*Ann. d'Ocul.*, September, 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, December 12, 1912). After enucleation of an eye with panophthalmitis due to a penetrating steel injury, there occurred an acute meningitis with fatal termination three days later. In spite of this unfortunate occurrence the writer favors enucleation in panophthalmitis, provided it is done early. In cases in which enucleation is contraindicated, he recommends a de Lapersonne exenteration. (Crucial incision, destruction of the whole ocular content by thermocauterization.) A. C. S.

Iris Prolapse.

Sloutchevsky, Odessa (*Woch. f. Ther. u. Hyg. des Auges*, January 23, 1913), advocates, in cases of iris prolapse in which operation is contraindicated or refused, careful massage with three per cent boric or four per cent xeroform ointment, home treatment consisting of instillations of atropin or eserin. The author claims this treatment brings about a gradual disappearance of the prolapse, or, rather, a reposition, and reports three illustrative cases. A. C. S.

A Case of Tuberculosis of the Retina Cured by Tuberculin.

Dor (*Lyon med.*, 1912, No. 38; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, November 28, 1912) reports a case of tuberculous gumma of the optic nerve and retina with detachment, in which three months' treatment with tuberculin resulted in a cure. A. C. S.

Yellow Ointment and the Silver Stick in Folliculosis and Trachoma.

Kaz, St. Petersburg (*Woch. f. Ther. u. Hyg. des Auges*, January 9, 1913), reports excellent results in three cases of folliculosis (following conjunctivititis) treated with the yellow mercurial oxid ointment. The patients themselves at bedtime introduced the ointment and applied massage. In each case a complete return to normal conditions occurred. In the treatment of isolated follicles, follicles remaining after rolling, and papillary proliferation of the conjunctiva (trachoma, chronic blennorrhea, vernal catarrh), he advocates applications with the silver stick. A. C. S.

Rupture of the Choroid as Probable Cause of a High Degree of Nearsightedness.

Pichler (*Klin. Monatsb. f. Augenh.*, September, 1912). The patient suffered a blow on the right eye when six years old. There was some inflammation, and the eye squinted from that time on. Examination showed a clearcut light yellow zone surrounding the disc, with an accumulation of pigment. Pichler was prompted to report this case because Pfalz in 1887 published a description of a case of myopia following a blow on the eye. Pfalz's patient had signs of an old choroidal rupture, but the history was not reliable. Pichler suggests a careful study of cases of myopia with a history of a previous blow, in order to bring out the connection between the two facts.

M. W. J.

Concerning the Myopia Question.

Jaspers (*Zeit. f. Augenheilk.*, Vol. 27, No. 6; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, November 28, 1912). Among 37,484 patients treated at the Marburg Eye Clinic from 1901 to 1911, 2,998 (7.99 per cent) were myopes, of whom 495 showed an anisometropia of 2 D. or more. High-grade myopia was observed more often in women. The near-workers predominated only among the low myopes, while among the higher myopes few near-workers were found. The most frequent complication, especially in men, was found to be staphyloma or conus. Other complications, such as choroiditis, vitreous opacities, divergent strabismus, and detachment of the retina, occurred more often in the women patients. Divergent strabismus and staphyloma were found oftener in near-workers, the other complications oftener in those not using their eyes for near work. Visual acuity diminished with increase of myopia, particularly in women. More defective vision, especially in the higher myopes, was found in the non-near-workers than in the near-workers.

A. C. S.

Concerning the Undoubted Existence of a New Error of Refraction—Biastigmatism.

Marquez, Madrid (*Arch. d. Oftalm. Mexico*, September, 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, December 12, 1912), ascribes this term to cases in which the corneal and lenticular axes of astigmatism form either an acute or obtuse angle with each other. The treatment consists in combining

two cylindrical lenses at the axes found by the ophthalmometer, and tests with the astigmatic chart. He suggests the possibility of triastigmatism. A. C. S.

The Eye Cup.

Wolffberg, Breslau (*Woch. f. Ther. u. Hyg. des Auges,* December 12, 1912), urges more general use of the eye cup (he recommends the Hess model) in affections of the lid and conjunctiva, and as a hygienic adjuvant to individuals engaged in dusty work. The eye bath is the best method of keeping clean the prothesis socket. A. C. S.

Dor's Improved Eye Cup.

v. Pflugk, Dresden (*Woch. f. Ther. u. Hyg. des Auges,* January 2, 1913). This is a glass eye cup to which a rubber collar is fitted, enabling a snug fit without undue pressure on the orbital margins. Moreover, removal of the same may be accomplished without spilling the contents. A. C. S.

A Simple Illuminating Apparatus for the Removal of Foreign Bodies From the Cornea.

Emanuel (*Klin. Monatsb. f. Augenh.*, September, 1912) describes a 5 cm. concave mirror of 160 mm. radius of curvature and focal distance of 80 mm., attached to a headband with a ball and socket joint. M. W. J.

Regarding the Question of the Diagnostic Value of Onesided Choked Disc and of Onesided Exophthalmos in Brain Tumor.

Mohr (*Klin. Monatsb. f. Augenh.*, October, 1912) had at his disposal the entire literature on brain tumor which was gathered for Uhthoff's work on "The Eye Changes in Diseases of the Cerebrum and Cerebellum," as well as a number of cases seen in the hospitals of Breslau since that work appeared. He is inclined to the opinion of Leslie Paton, who questioned whether we can come to a practical conclusion as regards tumor localization from the intensity of the changes in the eye grounds. In forty-one cases of choked disc, limited absolutely to one side, he found the tumor on the same side in 56.09 per cent of the patients. When both optic nerves were involved, the more intense process was on the same side in 70.8 per cent. In the rare cases of onesided neuritis, the process and tumor

were on the same side in 80 per cent. Contrary to Horsley, he did not find in cases with retinal involvement (hemorrhages, etc.) the most pronounced changes on the same side as the tumor. Where choked disc existed on one side and atrophy on the other, the results were always the same, i. e., atrophy and tumor on the same side.

In cases of exophthalmus the more proptosed eye, or if one-sided, the proptosis was on the same side in 85 per cent of the cases. M. W. J.

The Relations Between Perleche (Sores at the Angles of the Mouth) and Blepharoconjunctivitis, Both Induced by Diplobacilli.

Ishihara, Tokio (*Klin. Monatsb. f. Augenh.*, October, 1912). 1. The eczematous condition of the angles of the mouth known as perlèche, apparently very common in Japan, is due to the diplobacillus of Morax-Axenfeld. 2. Eyes inoculated from such lesions develop a typical blepharoconjunctivitis. The treatment of such mouth lesions is a measure of prophylaxis against possible eye disease. Ishihara some time ago pointed out that blepharoconjunctivitis probably follows the skin lesion and considers it proved by finding the diplobacillus in the mouth lesion. M. W. J.

Further Investigations Concerning the Presence of Pneumococci in the Normal Conjunctiva, Especially Concerning the Variance in Results.

Metafune and Albanese, Naples (*Klin. Monatsbl. f. Augenheilk.*, October, 1912), find that occurrence of pneumococci (chains) on the normal conjunctiva is subject to change. The organisms appeared and disappeared from the same conjunctiva without any apparent external cause. This difference in results is not due to the culture medium alone, but rather to the fact that the Elschnig-Ulbrich method, which they used, does not always reach the scant number of pneumococci present. The number of organisms present, as well as their vitality, is subject to change, and these factors may make it easy or difficult to demonstrate their presence. They believe that this method (Elschnig-Ulbrich) gives a relatively reliable measure of the germ content of the conjunctiva. Although the result of their work showed that about 40 per cent of normal con-

junctivæ contain pneumococci, still they believe this number is too low. They are not ready to admit, however, that the figures of Gasparini (80 per cent) represent the degree in which pneumococci are found on the normal conjunctiva.

M. W. J.

Sympathetic Ophthalmia and Aural Disturbances.

Peters, Rostock (*Klin. Monatsb. f. Augenh.*, October, 1912), believes, with Komoto, who recently discussed the subject in the same journal, that the deafness is due to involvement of the labyrinth, and offers as a possible explanation of the relationship between sympathetic ophthalmia and deafness the following interesting facts: In man, as well as in lower animals, pigment is present in the labyrinth, and Peters suggests that this pigment may stand in close relationship with that found in the eye. As evidence, he calls attention to the fact that deafness has been found in albinotic cats and dogs, and that these animals lack this labyrinthine pigment. This is in line with the recent publications of Elschnig and Kümmel, who suggested that the question of sympathetic ophthalmia may be explained as a phenomenon of anaphylaxis due to sensitizing of pigment. Peters suggests the possibility that the eye pigment may similarly be influenced by that of the ear, or by the ear phenomena seen in some cases, and that we may in this way explain those socalled spontaneous double-sided iridochoroiditides which have arisen under the picture of a sympathetic ophthalmia. Incidentally the possibility of explaining the blanching of cilia on the side of the sympathizing eye or its fellow by the same process is commented upon. M. W. J.

A Clinical Contribution to the Subject of Stimulation of the Smooth Lid Muscle Fibers.

Hessberg, Essen a. Ruhr (*Klin. Monatsbl. f. Augenheilk.*, October, 1912). A man aged 39 was struck on the right eye with a blunt object. Exophthalmos of slight degree ensued, with slight dilatation of the pupil, and on looking down the right upper lid did not descend with the left. The width of the right tarsal cleft became greater under the influence of cocain, and the author considers the symptoms due to a stimulus of the smooth muscle fibers of the lid. He believes that the action of the cocain proves that the lid phenomenon was not

Graefe's sign, and that these facts are in accord with the anatomic findings of Krauss. He thinks this case bears out Krauss' conclusions regarding the manner of action of the membrana orbita palpebraris musculosa, by which term he designates that portion of the smooth musculature of the orbit which lies in the anterior portion of the cavity in close relationship with Tenon's capsule and the levator palpebrarum superioris. It has also been called the superior tarsal muscle. Landstroem recently brought these fibers to our attention, because he thought he had discovered a new muscle. Sattler and Krauss have since denied his assertion. M. W. J.

On the Occurrence of a Hemianopic Scotoma in Disseminated Sclerosis and Retrobulbar Neuritis (Neuritis Chiasmatis et Tractus Optici).

Rönne, Copenhagen (*Klin. Monatsbl. f. Augenheilk.*, October, 1912), reminds his readers that a primary chiasm disease is known to occur in the optic neuritis which accompanies an acute myelitis, called by the French neuromyélite optique aiguée. The condition is accompanied with temporal hemianopsia. Primary chiasm disease has been described in a case of blood poisoning by Elschnig, and in tabes by Fuchs and others. The condition has been seen in disseminated sclerosis, but no hemianopic scotomata were found in these cases. Rönne found such fields in two cases of multiple sclerosis, and in a patient suffering with retrobulbar neuritis in which the involved field was limited to one eye. A fourth case, of double retrobulbar neuritis, showed hemianopic central scotomata, and Rönne thinks the patient had multiple sclerosis. The fifth patient with hemianopic scotomata had an acute retrobulbar neuritis. M. W. J.

On the Success of the Elliot Trephine Operation for Glaucoma.

Stock, Jena (*Klin. Monatsb. f. Augenheilk.*, October, 1912), after having performed this operation repeatedly, comes to the following conclusions:

1. Rise of tension is the cause of the excavation and disturbance of vision.

2. The tension must be reduced.

3. Theoretically, it would be best to operate on every primary glaucoma patient having increased tension.

4. The trephine operation of Elliot is to be recommended above all others.

5. The trephine operation of Elliot, in every case, can take the place of the ordinary iridectomy.

6. The trephine operation is easier and less dangerous than the old iridectomy or all other glaucoma operations.

7. There are, of course, cases in which we would not take the risk of operating. In this class are old persons whose tension can be reduced by miotics and who we know are positively going to use the drug as prescribed. Also occasional cases of glaucoma with relatively slight rise of tension and great loss of the visual field, where we can no longer expect the operation to check the advance of the disease.

8. The sooner the operation is done the better our chances to cure the patient, and therefore we should propose it as early as possible.

9. We can do this more easily if the proposed operation is not very dangerous, and Stock considers the trephine operation of Elliot one of the least dangerous. M. W. J.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

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SAN FRANCISCO.

AND

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CINCINNATI.

Mottled Degeneration of the Macula Lutea.

Nuel, J. P., Liege (Dégenerescence pommelée de la macula lutea, *Archiv. d'Ophtalmologie*, August, 1912, p. 465). Many macular alterations which have been recognized with the ophthalmoscope have not found their counterpart in anatomic demonstration, just as the reverse is true that we do not know the ophthalmoscopic appearance of macular changes which have been seen under the microscope. Nuel's anatomic description of the macular star seen in Bright's disease met with a certain amount of skepticism, which he hopes his recent demonstration at the Congress of the French Society of Ophthalmology has dispelled. In this article he presents a case of mottled degeneration of the macula lutea, which he had formerly described under the name of vesicular edema of the macula lutea. Having occasion to enucleate an eye with this macular change, Nuel found that the anatomic change did not correspond with his first idea. This mottled condition of the macula is sometimes of traumatic origin, sometimes idiopathic, and it is of the latter form that Nuel writes. It is seen in old people, with arteriosclerosis and more or less cardiac changes, both eyes (generally) showing a marked amblyopia (fingers at several meters), generally without contraction of the visual fields. Once established, the amblyopia shows small tendency towards diminishing, but, on the other hand, seldom leads to total blindness. The bilaterality and the chronicity of the

affection, and the kind of amblyopia (central scotoma), suggest toxic origin, but the ophthalmoscope establishes the true diagnosis. The macular region, and this only, is dotted with small bright circles, the edges of which fade into the surrounding retina. Their location may be restricted to one side of the macula, and the color is shrimp-pink to yellow. The optic disc, which is normal in appearance at first, later on shows a temporal pallor similar to that seen in toxic amblyopia. There is central scotoma, generally double, and a diminution of vision which is more intense when the macula proper is the seat of the lesions. As a rule the patients complain of metamorphopsia at the point of fixation; this becomes less with time. A prominent symptom is nyctamblyopia, and achromatopsia is often complained of in the region of the central scotoma.

A photomicrograph shows a cut through the foveal region of one of the cases. Throughout the macular region the pigmented epithelium of the retina is raised in spots by a solid transparent exudate; this exudate is finely granulated, shows no evidence of a lamellar structure, and takes none of the stains used by the author. The covering pigment epithelium is normal in appearance, except that it is somewhat thinned where it is uplifted. The internal lamella of the choroid is also normal. The fovea proper is not the seat of an exudate, but shows great disturbance of the nerve elements, the cones being elongated and warped.

At first sight one would think that the interstices between the exudates are normal; a stronger power, however, shows that the exudates are connected by a thin layer of the same substance. As to the provenance of the exudate, one is tempted to assume that it is of the same nature as that contained in the "drüsen," and that the choroid is therefore the origin. Nevertheless, there are differences between the two, inasmuch as the "drüsen" are discrete and the retinal pigment very thin over them when they attain to any considerable size. Furthermore, the "drüsen" are seen more often at the periphery than in the macular region, and show a striation parallel to the surface, as a result of the successive deposits of material, and stain well with eosin.

The pathologic findings explain the clinical symptoms very well: the central scotoma, the metamorphopsia (due to the disarrangement of the cones), the central retinal torpor, etc.

This is a rare condition, but not as rare as ophthalmologic literature would lead one to suppose. It can be recognized in the upright image only. The author has seen five cases. Nothing is said about the therapy. M. W. F.

Degeneration of the Palpebral Conjunctiva, Especially Colloidal Degeneration.

Cazaux, J., Hanoi, French Indo-China (Les dégénérescences de la conjonctive palpebrale, et de la dégénérescence colloide en particulier, *Archiv. d'Ophtalmologie*, August, 1912, p. 472). An Ammanite woman, aged 44 years, had noticed a swelling of long standing in both lower lids. In addition, she had old trachoma scars in both lower lids, both of which showed ectropion. The right eye bore a large pterygium. The field of vision was limited on account of the great narrowing of the palpebral fissure, but the central visual acuity was good. The masses in the lower lids were extirpated, the pterygium removed, and an ectropion operation done on both upper lids, giving the patient great relief and increased visual field. The body of the article is devoted to a historic resume of hyalin, amyloid and colloidal degeneration, and must be read in the original to be appreciated. M. W. F.

Ocular Complications in Paget's Disease.

Coppez, Brussels (Complications oculaires de la maladie osseuse de Paget, *Archiv. d'Ophtalmologie*, Vol. XXXII, September, 1912, p. 530), describes the ocular complications which he has seen in four cases of Paget's disease (osteitis deformans). The changes consisted in fine spots of a yellowish color, and about the size of a pinhead in the upright image, situated in or near the macula. In one case small hemorrhages were added to the spots. Metamorphopsia was present in all cases, likewise lenticular changes. In one case there was diplopia, due to the displacement of the pulley of the superior oblique by the osseous growth. The patients were all middle aged or old, and were suffering with chronic gout or rheumatism. Wassermann was negative in all cases. Therapy was of no avail. The macula being one of the parts of the economy sensitive to trophic disturbances, it does not surprise one to find these changes in a disease involving so many trophic disturbances in other parts of the body. M. W. F.

Operations on the Vertical Eye Muscles.

Landolt, E. (Les opérations sur les muscles moteurs verticaux des yeux, *Archiv. d'Ophtalmologie,* Vol. XXXII, October, 1912, p. 593). It is very refreshing to hear the truth about the operations on the eye muscles from this indefatigable worker in that field. He tells us that vertical strabismus, sursum et deorsumvergens, is much rarer than strabismus in the horizontal plane, and never attains the high degrees of the latter, 20° of vertical strabismus representing the maximum degree, whereas 45° and more are often attained in horizontal strabismus. The ultimate effect of operations on the verticals is much less than that of operations practiced on the horizontals. No sensible clinician will attempt to predict with any accuracy the final result of any operation for strabismus, as there are many other factors besides length and insertion of an ocular muscle, and these defy any approach to mathematic accuracy. It is, therefore, an absurdity to predict that the effect of an operation will amount to so and so many degrees, and, for the same reason, to say that a certain amount of advancement or retrodisplacement is indicated in a given degree of strabismus. This does not, however, prevent us from estimating and dosing these procedures in an approximative way. Thus, we may say, roughly speaking, that a tenotomy of the superior rectus will change the direction of the eye by about 5 degrees. Landolt hastens to add that in doing the tenotomy he is very careful to incise the conjunctiva along one of the borders of the muscle, and to detach the tendon without injuring the adjacent tissue. He rarely does a tenotomy on the horizontal muscles, as he finds that an advancement, combined, if needs be, with a resection of the muscle, is sufficient to overcome almost any amount of horizontal strabismus. The moderate tenotomy of the superior rectus, however, seems to Landolt to be more justified than the tenotomy of any other eye muscle. The reason is that the resultant loss of power, which amounts almost to a paresis, shows itself after a tenotomy of the superior rectus in a rarely used position of the eyes, that of looking upwards, and this defect can be remedied by tilting the head upwards. Tenotomy of the superior oblique is therefore justified, if the deviated eye does not show a strabismus of more than 5°. He would never, on the other hand, do a tenotomy on an inferior rectus, for the paresis would inter-

fere with a position of the eyes which is of the greatest importance, that of looking downwards, even though the correction in the primary position were perfect. As high degrees of vertical strabismus are due to a paralysis of a depressor or elevator, the logical procedure would seem to be the advancement of the paralyzed muscle. The advancement of the oblique presents such difficulties, however, that it has never been attempted. Besides, the advancement of the rectus muscle associated with the paralyzed oblique has given Landolt such excellent results that he has never thought of undertaking an advancement of the oblique. As illustrations Landolt cites first the case of a man with a paresis of the superior rectus, a deorsumvergent squint of 10°, and a divergent squint of 5°; advancement of the much resected muscle gave a perfect result, the immediate effect being a marked overcorrection. In another case the eye was turned down 13°, out 3.5°, and could be raised only 15° above the horizontal. The superior rectus was resected several millimeters and advanced to the margin of the cornea. Five days after the operation the eye stood 5° above its fellow. One month later there was perfect fusion of the visual images, and the eye could be raised to 55° above the horizontal, the excursion in this direction having been increased by 40°. This result had already been maintained twelve years. In a case of traumatic paresis of the superior oblique resulting from an operation on the frontal sinus, an energetic advancement of the inferior rectus gave an overcorrection downwards of 8°, but in a fortnight perfect fusion of the images had been established and has since existed for ten years. A similar result was obtained in a young man in whom the defect had existed since childhood; fusion was perfect in the primary position, but in looking to the right or left the paresis of the superior oblique was still manifested by a lowering or raising of the eye. In 1899 a man thirty-two years old presented himself with paresis of both internal recti, and of the external rectus of the left eye. The excursions of the left eye amounted to 10° inwards, and 22° outwards; those of the right eye to 15° inwards, and 60° outwards. Resection and advancement of both internal recti were done, with the result that the man was enabled to attend to his affairs without trouble for thirteen years, when he again presented himself, this time with a paresis of the inferior rectus of the left eye. The left eye was

deviated upwards 12°, and outwards 6°. The inferior rectus was shortened 4 millimeters, and attached to the corneal limbus by two stout sutures. The immediate effect of the operation was to place the left eye 16° lower than its fellow, giving as a result of the advancement 28°. A few weeks later the overcorrection had disappeared, and fusion was perfect. The amplitude of accommodation amounted to 11.25, thus depassing the normal.

Whereas the advanced horizontal muscles willingly take a new insertion near the cornea, the verticals seem to show a marked tendency to recede from the place to which they have been transplanted. The overcorrection in operations on the verticals is therefore more necessary for final success than in operations on the horizontals. M. W. F.

The Syndrome of Mikulicz as a Physiologic Condition.

Frenkel, H., Toulouse (Sur le syndrome de Mikulicz a l'état physiologique, *Arch. d'Ophtalmologie*, Vol. XXXII, p. 721, December, 1912), recalls the conclusions which he formulated in 1909, which do not seem to have received the proper consideration:

1. Along with the physiologic syndrome of Mikulicz, consisting of a symmetric hypertrophy of the salivary and lacrimal glands, we must admit the existence of an analogous physiologic syndrome concerning only the salivary glands of both sides.

2. In the physiologic syndrome of Mikulicz the parotid, sublingual and submaxillary glands are concerned, showing an increase in size, hardening, but no pain or derangement of function.

3. The glandular hypertrophy is symmetric, with small variations between the sides as well as between the increase in size of the parotids and the other salivary glands.

4. The submaxillary glands are often displaced, both as to their surface relations and as to their depth and nearness to the larynx.

5. The histologic examination of a submaxillary gland excised from a living subject has shown the perfect integrity of the acini as well as of the cellular components.

6. The frequency of this physiologic syndrome may be estimated at 1 per cent of the population(this is for Toulouse),

affecting men more than women, and seeming to be dependent somewhat on heredity.

7. The parotid swellings, resembling mumps, are the first to attract attention, and lead to the detection of the other glandular swellings.

8. The other glands throughout the body, and the lymphatic system, are normal, and the blood shows no abnormalties.

If to the physiologic syndrome an inflammation of the lacrimal glands is added, the picture of Mikulicz's disease is complete. An attempt to assign a tuberculous etiology to this syndrome seems absurd to Frenkel. M. W. F.

Contusion of the Crystalline Lens.

Bonnefon, Bordeaux (La contusion du crystallin, *Arch. d'Ophtalmologie*, Vol. XXXII, December, 1912, p. 748), has undertaken a number of experiments on rabbits to determine the results of direct trauma of the lens. He used solid hard rubber rods, with which blows of varying force were directed immediately upon the eye. After examining the eye in corpore the animal was killed, the eye enucleated, and laid, with the cornea downward, on a compress. With a sharp razor an incision is made behind the equator, and the incision is enlarged with scissors to comprise about two-thirds of the posterior hemisphere. This leaves a cup filled with vitreous, at the bottom of which is the lens resting on the iris, with intact zonula. Three cuts with the scissors through the sclera as far as the ciliary region, and the detachment with the blunt handle of the scalpel of the three resulting flaps from the ciliary insertion, allow the transfer of the lens and zonula in an intact condition into a glass cup, where the lens can be examined from below, by oblique illumination, etc. Following the first examination the lens is immersed in a solution of methylene blue for three to four minutes, and then examined under a low power. The capsule is then incised in the equator, laid flat, and again examined.

While the conditions under which the trauma takes place must always be considered, still the result is the same as those obtained by Bonnefon, provided the zonula is not ruptured. When a rupture of the zonula takes place, the stress on capsule and lens matter is so slight that a rupture of the capsule or a disarrangement of the lens fibers does not take place, and such a luxated or subluxated lens will retain its transparency.

With the lesser traumata the changes are generally limited to the epithelium of the anterior capsule, and a restitutio ad integrum is the rule. With repeated or stronger traumata there results destruction of the lens fibers and of the posterior lens capsule, which are more apt to be permanent. The immersion in coloring fluid shows that the injuries in these cases generally follow the natural lines of cleavage in the lens.

M. W. F.

Active Congenital Enophthalmus With Simultaneous Closure of the Lids, Associated With Ophthalmoplegia Interna.

Aurand, Lyons (Enophtalmie active congénitale avec occlusion simultanée des paupières. Ophtalmoplégie interne associée, *Revue Générale d'Ophtal.*, November, 1912), describes the following case: Patient was a net-maker, 23 years of age, whose vision had been failing for two months. No constitutional disturbances nor subjective pain, and no hereditary taint. Has a healthy child, and wife has had no abortions. Superficial examination revealed a moderate mydriasis in the right eye alone. Light reflexes were absent in both eyes, but pupil of left eye reacted to accommodation. Ophthalmoscopic examination showed normal fundi. While able to read easily at proper distance with the left eye, a + 3.0 was necessary to utilize the right eye, revealing a unilateral paralysis of accommodation. Treatment with pilocarpin and antispecifics gave a partial result within one and one-half months, so far as accommodation was concerned, but light reflexes remained in abeyance. Wassermann was negative. Upon closer examination, a complete paralysis of the right externus muscle was revealed, and in adduction of the left eye the right took on a secondary convergent squint. When patient looked to the right the lids of the left eye closed almost completely and the eyeball sunk back into the orbit, in proportion to the effort made, so that between the quivering lids only a small portion of the cornea was visible. In extreme adduction the eye was drawn slightly upward, although the lids were pressing tightly against the retracted globe. Elevation and depression were normal, with no lid movement. This condition had existed since birth, although there was no history of traumatism during delivery. Similar cases reported by Green, Galezowsky, Murray and Brown are briefly described. Duane

has reviewed and tabulated the complete literature on the subject, but no fitting explanation for the phenomenon has been offered. J. S. W.

A New Ether Apparatus in Ophthalmic Surgery.

Rollet, Lyons (Nouvel appareil à éthérisation pour la chirurgie oculaire, *Revue Générale d'Ophtal.*, December, 1912), uses local anesthesia wherever it is practicable, but in certain plastics, enucleations, deep orbital operations, and when the eye is inflamed and painful, he feels the need of a general anesthetic. Chloroform proved fatal in one of his patients, and he has abandoned this means. Ethyl chlorid, in quantity not over 10 cc., allows him to perform bilateral iridectomies, strabismus operations and work upon children. When a longer time is necessary, he supplements the anesthesia with ether, and for this administration has devised an apparatus which does not interfere with the surgeon. A small rubber mouthpiece fits over the chin and rests on the cheek; it is connected with a rubber bag by a 20 cm. metal tube, which has an angle to allow the long axis to run horizontally. The bag is the ether container and has an opening to allow for air and renewing of the anesthetic. The length of the tube permits the rubber sac to rest upon the shoulder of the patient, removed from the operator's field of vision, and allows the eye and its adnexa to be in uninterrupted view. The illustration explains the procedure. J. S. W.

Duboisin Should Be Preferred to Atropin in the Treatment of Ocular Disease Especially for Infants.

Santos Fernandez, Havana (La duboisine doit être préférée a l'atropine dans le traitement des maladies des yeux, surtout chez les enfants, *Revue Générale d'Ophtal.*, December, 1912), formerly used atropin, but since de Wecker and Panas reported so favorably upon the more powerful and less toxic effect of duboisin, has been converted to its use. Children absorb atropin very readily through the lacrimal passages, and show marked intoxications which do not follow duboisin. This also applies to adults who show drug idiosyncrasies. The action upon the nervous system of duboisin is sedative and hypnotic, and can be used with success in mania, insomnia, alcoholics, etc. Children are flushed and excited by

atropin, so that the author always dilutes one drop of a one-half per cent solution in fifteen drops of water in newborn children, as we know that atropin dilates the pupil in doses of 0.0002. Several examples of the disagreeable effects of atropin are related: in one case a young woman was delirious for several hours, from instillations into the conjunctival sac. As this is not a passionate outburst in favor of a substance which the author employs with much success, he relates a case in which one drop three times a day of a one per cent solution of duboisin was quit toxic. In conclusion, Fernandez finds the action of atropin and duboisin nearly equal, but the toxicity of the latter is less violent and less frequent than the former, and he recommends its exclusive use, without exception, in all cases of children. A full bibliography accompanies the article. J. S. W.

Milky Cataract Opening Spontaneously Into the Anterior Chamber.

Rollet and Genet (Cataracte citeuse ouverte spontanément dans la chambre antérieure, *Revue Générale d'Ophtal.*, January, 1913) describe a rare case. The patient, a blacksmith, 67 years of age, was operated seventeen years previously for cataract of the left eye, by the simple method and with good result. Gradually he lost sight in the right eye, but paid no attention to this, as the vision in the operated eye was good. On September 27th he experienced much pain in the right eye, with redness and loss of light perception, and this continued for three days, when he presented himself to Prof. Rollet. The cornea was milk white and had the appearance of an interstitial keratitis, iris not visible and tension increased; the picture of a glaucomatous attack. Under miotics the tension diminished, the anterior chamber cleared, and three weeks later, with round pupil and tremulous iris, the condition resembled that of the old operated eye. The explanation shows that the patient had a Morganian cataract which ruptured into the anterior chamber with a disappearance of the nucleus into the vitreous, which produced the hypertension, a gradual absorption of the exudate, and the aphakic eye coming back into its normal state. J. S. W.

ABSTRACTS FROM SPANISH OPHTHALMIC LITERATURE.

BY

WILLIAM H. CRISP, M. D.,

DENVER.

Hermofenil and Fluorol in Lacrimal Affections.

LANDAZABAL, Vitoria (*Archivos de Oftalmologia*, October, 1912). A number of cases of dacryocystitis were treated with one or both of these drugs by injection of 5 to 7 and 2 per cent solutions respectively, after or without probing. The results with hermofenil were especially gratifying, and the author considers that success was obtained in a number of cases in which extirpation of the sac would otherwise have been necessary.

Salvarsan in Ocular Affections.

MORALES, A. (*Archivos de Oftalmologia*, October, 1912). In a case of iritis with condylomata, pain ceased within twenty-four hours, and complete cure occurred in eight days, after intramuscular injection of four decigrams of salvarsan. Notable improvement in visual acuity was obtained in a case of tabetic optic neuritis. A case of vitreous opacity which had resisted long-continued treatment with mercury and iodid, and in which vision had been reduced to one-third, improved so that the visual acuity was almost normal forty-eight hours after intravenous injection of four decigrams of salvarsan.

The "Ora Serrata."

LEOZ ORTIN, Galo (*Archivos de Oftalmologia*, October, 1912). Careful microscopic study by special staining methods indicates that the common conception of the ora serrata, as a line along which the visual retina suddenly loses many of its elements and narrows into the pars ciliaris, is inaccurate. The transition begins in the region of the equator and proceeds slowly and almost imperceptibly. There is no retinal rim or

projecting border (except in the rabbit), and the descriptions of such an arrangement are due to artificial conditions arising during fixation processes. The disposition of the several retinal layers is described in some detail.

New Ophthalmoscope.

Marquez, M., Madrid (*Archivos de Oftalmologia,* October, 1912). On the basis of a plane mirror, the alternative use of either plane or concave mirror is obtained. This is done by adding to the plane mirror, when the concave effect is desired, a plano-convex lens of two diopters. The lens has an aperture to correspond with that in the mirror.

Ocular Accidents From Lightning.

Santos Fernandez, J., Havana (*Archivos de Oftalmologia,* October, 1912). Cataract developed in the right eye of a boy who had been struck unconscious by a lightning flash. The right eye of a telegraphist who approached his apparatus during a thunder storm was exposed to an intense flash of light during an electrical discharge, although he did not lose consciousness and did not feel the effect of the current in his body. Five days later the lids and conjunctiva of this eye were edematous, the pupil fixed and contracted, the aqueous turbid, and the lens cataractous. Light perception was permanently lost. In the third case the patient's history indicated a lightning stroke as the primary cause of a total adherent leucoma.

Bilateral Aniridia and Congenital Zonular Cataract.

Marin Amat, M., Almeria (*Archivos de Oftalmologia,* October, 1912). The parents were cousins. The iris was entirely absent in each eye, and each lens showed an annular punctate opacity midway between the pole and equator. Vision was: Right eye, 1/3; Left eye, 1/20; not improved by lenses.

Serous Iritis.

De Gouvea, H., Rio de Janeiro (*Anales de Oftalmologia,* October, 1912). In each of the four cases reported the disease had persisted for a considerable period, and had been unsuccessfully treated by various methods. Vision was reduced in two cases to fingers at 50 cm., in one to quantitative per-

ception of light, and in the fourth to fingers at four meters. In every instance a tuberculin test was positive. Under tuberculin treatment, begun with very small doses, cures were obtained with respective vision of 1., 0.5, 1., and 1.

Corneal Ectasia, Retinitis Pigmentosa, and Congenital Optic Atrophy in Three Sisters.

Pons Marques, L., Mahon (*Archivos de Oftalmologia,* November, 1912). The remarkable feature of these cases is the simultaneous presence in three sisters of conditions not ordinarily so associated. All three sisters were blind from birth, in each the fundus presented complete optic atrophy and the characteristic deposits of retinitis pigmentosa, and in all three both eyes showed marked bulging of the cornea. The mother asserted that the corneal condition had been noticed shortly after birth in each sister. In two of them there was marked, in the other only slight, nystagmus. The patients were otherwise in good health and normal, and had never had any attacks of pain in the eyes. There was no consanguinity or history of eye disease in the ascendants, nor could evidence of syphilis be discovered. Two sisters had died in infancy, and one of these was said to have been blind. Another sister and a brother, who had both died in adult age, had had no disturbance of vision, and two living brothers had good eyes.

Question of Late or Noninterference in Traumatic Cataract.

Santos Fernandez, J., Havana (*Archivos de Oftalmologia,* November, 1912). In the first case reported, the patient was 33 years of age. His right eye was cut with a broken bottle, the wound extending from the center of the cornea to the limbus, and involving the lens. The patient was kept quiet and the eye covered with an antiseptic dressing. After eight days there was some pain, which yielded to an analgesic. A month after the accident the eye was perfectly quiet, and the lens was diminishing in volume. Two weeks later the patient counted fingers with this eye. At the end of three months the media were perfectly clear, and good vision was obtained with a plus 12 sphere. The author's second case is similar in history to the first. He argues from these and other similar observations that interference with traumatic cataract is unduly frequent.

Gaseous Subconjunctival Injections.

Blanco, T., Valencia (*Archivos de Oftalmologia,* November, 1912), states as the result of his experiments (which, however, he does not describe) that gaseous subconjunctival injections considerably diminish the intensity of the subjective symptoms of superficial corneal affections, such as phlyctenules, herpes, and the corneal lesions accompanying trachoma. The process of repair also appears to be hastened. In episcleritis, scleritis, and deep corneal affections, the effects are merely palliative as regards the symptoms. Hot fomentations or vapor douches, combined with instillations of dionin, and where necessary with subconjunctival injections of scopolamin, have infinitely more value than injections of air in the treatment of parenchymatous keratitis. The difference in intensity of action between injections of air and of oxygen is clinically imperceptible. All such gases act purely in a mechanical way by virtue of their bulk.

Retraction of the Upper Lid.

Lutz, Anton, Havana (*Anales de Oftalmologia,* December, 1912). The patient was a man of 27 years. The anomaly had been definitely noticed at the age of five years, and was probably congenital. Fundus and pupillary action were normal. There was slight ptosis of the right eye, and a moderate weakness of the right superior oblique. The other ocular movements were entirely normal, and the position of the eyes had no influence on the anomalous feature of the case. This consisted of a marked retraction of the right upper lid, sometimes occurring on opening the mouth, but always provoked by lateral movement of the lower jaw to the left. The patient also had the power of voluntarily retracting the right upper lid without the accompaniment of other movements, the mouth being kept shut. This power of voluntarily producing the abnormal movement distinguishes the case from all similar ones hitherto reported. The author assumes a supranuclear location for the central defect controlling the anomaly, probably in the posterior longitudinal bundle or the optic thalamus.

ABSTRACTS FROM NORWEGIAN OPHTHALMIC LITERATURE.

BY

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DENVER.

Unilateral Amaurosis, With Fundus Appearance of Embolism of the Central Retinal Artery, Following Criminal Abortion —Striking Restoration of Vision.

GJESSING, HARALD, Drammen (*Norsk Magazin for Laegevidenskaben*, November, 1912). Pregnancy was interrupted at five weeks by means of a bougie introduced into the uterus. A week later the twenty-year-old patient became blind in the left eye. The heart was normal. Ophthalmoscopic examination showed the characteristic appearance of embolism of the central artery of the retina. Several days later the affected eye counted fingers at 0.5 meter. Fixation was eccentric. A 5 mm. object was not perceived over the whole lower half of the field and in a large central area. But vision was good in an arched area, extending on the temporal side to 40°, above to 40°, and on the nasal side to 40°, and whose lower limits extended approximately to the horizontal meridian. There were two large cilioretinal arteries running towards the macula, and two on the other side of the disc. The central artery divided into its two main branches back of the lamina cribrosa. Vision gradually improved, until seven weeks after blindness began the vision, a little to the temporal side, was 5/36. The absolute central scotoma was replaced by a relative one for white and colors. The presence of the cilioretinal arteries, with softening of the embolism, are regarded as responsible for the relatively good recovery.

Two Cases of Amaurotic Idiocy.

MAGNUS, V. (*Norsk Magazin for Laegevidenskaben*, November, 1912). In the first case the child was twenty months old at the time of examination. At seven weeks the mother

had noticed that the baby could not hold up its head, "that the head dangled," and that the child cried day and night. At six months the child had intestinal catarrh for six weeks. At sixteen months there were a number of epileptiform convulsions. At the time of examination the chin rested constantly on the chest; and if the head was raised and let go, it flopped either forward or backward or to one side. The arms and legs were flaccid. The patient could not take firm hold of anything. Attempts to seize objects were very clumsy, reminding the surgeon of the intention tremor of a marked case of disseminated sclerosis. The pupils were equal and reacted to light. With the ophthalmoscope both discs were found pale and sharply outlined, and in the macular region was a round white spot with a red central point. None of six other children were ailing, and nervous and mental disease were unknown in the family as far back as the parents' record went. The parents themselves were unrelated, and were of old Norwegian peasant origin, without any intermixture of Jewish blood. The second case reported is that of a boy of seven years with defective central vision, nystagmus, some difficulty of speech, and choreic movements of the face, head, hands and legs. There was distinct optic atrophy, though the macular region appeared normal. A sister of this boy had died at fourteen years, after a group of symptoms which included blindness, palsy, and dementia.

The Refractive Coefficients of the Ocular Media.

Schiötz, Hj., Christiania (*Norsk Magazin for Lacgevidenskaben*, February, 1913). The measurements relating to the aqueous and vitreous humors were made with a Zeiss refractometer. Fourteen tests were made on aqueous which had been taken in the course of operations on cataractous and other eyes. The average value was 1.335, or rather lower than given by Helmholtz and Tscherning (1.3365) and Krause (1.342). For the vitreous freshly enucleated eyes were used, all of course more or less pathologic, but in all except one of the thirteen eyes used the vitreous appeared quite clear and transparent. In every case the coefficient was slightly higher than that of the aqueous, the lowest value being 1.33544. The lowest figures were had from a severely wounded eye, a case of absolute glaucoma, one of secondary glaucoma, and two of hypopyon

keratitis. Intermediate values were given by a cyclitic eye, an eye with a perforating wound, a case of staphyloma following serpent ulcer, one of choroidal sarcoma, and one of secondary glaucoma. The highest figures were had from an eye in which iridocyclitis had followed dislocation of the lens into the vitreous, 1.34; from one of ulcus serpens with iris prolapse, 1.344; and from a case of corneal staphyloma and ulcer in which the vitreous was slightly infiltrated, 1.348. The coefficient of blood serum is 1.3505. The refraction of an eye diminishes as that of the vitreous increases, yet in conditions like cyclitis we sometimes find that the refraction of the eye becomes greater instead of less. This is probably due to spastic accommodation. The author is disposed to attribute to changes in the refraction of the vitreous those variations in refraction sometimes seen in the eyes of diabetic patients.

Nine measurements with the microscope of the refraction of the cornea gave an average coefficient of 1.393; and ten measurements of the lens refraction an average of 1.4102, as against Tscherning's 1.42, Helmholtz's 1.4519 and 1.4414, etc. The increase in refraction of the lens with age was very slight.

SOCIETY PROCEEDINGS.

BY

ARTHUR J. BEDELL, M. D.,

ALBANY.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Meeting of May 20th, 1912. Dr. Thomas Faith, President, presiding.

SYMPOSIUM OF CHRONIC GLAUCOMA.

Etiology of Chronic Glaucoma.

Dr. Martin H. Fischer, Cincinnati: Glaucoma is an edema of the eyeball, and all the clinical signs of this pathologic entity are so explained. The eye, like any other tissue in the body, holds normally a certain amount of water. The amount thus held is determined by the hydrophilic colloids of the eye (the proteins chiefly) and the state in which these exist. Edema is a condition in which the amount of water thus held is increased. In glaucoma the hydration capacity of the tissues of the eye (including the vitreous and aqueous humors) is increased. Various conditions are able to increase the hydration capacity of a protein colloid and so to lead to an edema of the affected part. A most important factor in this regard is an increase in the amount of acid present in the part. Any circumstance which will lead to an abnormal production or accumulation of acid in the eye will lead to glaucoma. What are ordinarily classed as causes of glaucoma (arteriosclerosis, circulatory disturbances, kidney disease, hard mental or muscular work, worry, high protein diet, diabetes with acidosis, local circulatory disturbances in the eye, intoxications of a general or local type which affect the eye, injuries and operations affecting the eye, cold, starvation, etc.)

all have this in common, that they lead to an abnormal production or accumulation of acid in the eye. In consequence of this abnormal acid content the hydration capacity of the ocular colloids is raised, and a glaucoma results, not because water is pushed into the ocular colloids, but because these suffer changes which make them suck in water from any available source. Obliteration of the filtration angle is not the cause of glaucoma, but a consequence resulting from the fact that in glaucoma the colloids behind the lens swell more than those in front, and so the lens and iris are crowded forward. As the swelling progresses the glaucomatous eye tends to make itself worse, for in swelling it compresses the blood vessels within the eye and so adds to its already precarious state the superimposed effect of a lack of oxygen due to defective blood supply; and so by the resulting further abnormal acid production and accumulation a vicious circle is established. Eserin and other drugs which by contracting the iris open up the vessels in the ciliary body and so give a better blood supply may, therefore, at any time be successful in removing a last straw which makes an eye just on the edge of a glaucomatous attack go over; on the other hand, atropin, cocain and similarly acting drugs have a reverse effect, favoring not only a compression of blood vessels, but adding a direct toxic effect which in the end leads to an abnormal production and accumulation of acid. In the treatment of glaucoma we must first get as clearly as possible before our minds all the conditions which in our patient are leading to an abnormal production or accumulation of acid in the eyeball. Rarely will only one etiologic factor be responsible. An abnormally high acid content may be induced in an eye quite as easily through an abnormal acid production which results from too hard muscular work, a leaking heart or a bad dietary regime; an arteriosclerosis that manifests itself especially in the circulatory apparatus of the eye, an inflammation of the ciliary body or a cataract extraction. When we have removed as many of these conditions as possible, we then meet the effects of those which we cannot remove. We need to give alkali to neutralize the acids present in abnormal amounts; we need to increase the salt content in the tissues of the eye, for all salts, including such neutral salts as sodium chlorid, decrease the amount of water that can be held by any protein swelling in the presence of an acid; and, finally, we need to give water

to wash out the acids (and any other substance) which are capable of increasing the hydration capacity of the ocular colloids. In actual practice this is accomplished as follows: As the patient is usually in the midst of a glaucomatous attack at the time that we see him, we describe the handling of this picture first.

1. It is our purpose to dehydrate the swollen eye as rapidly as possible. To accomplish this we may use either local or systemic means or both. To obtain a dehydration of the eye by systemic means we stop the intake of water by mouth and inject slowly into the rectum by the drop method, having the patient retain a liter or, if necessary, two liters of the following alkaline, hypertonic sodium chlorid solution:

Monohydrated sodium carbonate	4.1 grammes
Sodium chlorid	14.0 grammes
Distilled water .....1000.	cc.

When the injection is properly given the alkali and salt content of the patient's body is increased and the swollen eyeball shrinks. In from one to three hours the glaucomatous eye will then have returned to its normal tension. During the past year he had found a proper utilization of this scheme of treatment so effective that he had relied upon it entirely and so has largely given up the use of subconjunctival injections of sodium citrate. Once the tension in a glaucomatous eye has been reduced the patient must be kept from getting renewed attacks by keeping metabolism constantly toward the alkaline side. This means that the patient must be taught how to inhibit his acid producing factors while at the same time he is placed under the influence of a sustained administration of alkali, salts and water. Only in this way can an eye on the verge of a glaucomatous attack from such a condition as an arteriosclerosis of the blood vessels of the eye be kept from a frank attack, as the acid content in the eye is pushed beyond these tolerable limits by work, worry, dietary indiscretions, etc.

2. Local treatment in glaucoma resolves itself into an administration subconjunctivally of harmless salts to reduce the hydration capacity of swollen colloids. A freshly prepared sterile sodium citrate solution (5.41 per cent solution of the ordinary chemically pure $Na_3C_6H_5O_7 + 11\ H_2O$) is used. Enough must be injected to gently distend the subconjunctival

tissue (ten to fifteen drops). The short-lived pain following such an injection may be relieved by alternate hot and cold compresses. Failure to get a prompt reduction by such means indicates that the solution was of wrong composition, or that enough was not injected, or that the systemic acid content was so high that use of the salt subconjunctivally did not even temporarily prove effective. What is known as glaucoma in the eye is identical with the series of changes which in the kidney we call nephritis, and the principles of treatment governing both conditions are the same.

Dr. H. B. Young, Burlington, in his presentation of the

Medical Treatment of Chronic Glaucoma

expressed regret that there obtained in the literature an absence of unanimity of a definite nosology for this affection. He referred to a paper he presented in 1907 at the Louisville meeting of the Academy, in which he made a plea for the adoption of Schweigger's classification, viz., that a sluggish, more or less dilated pupil and a shallow anterior chamber, no matter how quiet the eye had otherwise been, always spelled inflammatory glaucoma. In this paper he also attempted to show that the use of the term "chronic" was misleading, because an inflammatory glaucoma which showed distinct periods of remission might be termed chronic or subacute as against the acute or fulminating, and in the noninflammatory, as distinguished by changes in the posterior segment of the globe only, unnecessary, because this progress is but seldom rapidly progressive. The consideration of the purely medical side of chronic glaucoma, Dr. Young thought, might be briefly disposed of were it not for the fact that many "side issues" of such treatment suggested themselves to him as worthy of consideration. In this connection he cited the complete and permanent relief with miotics of the glaucoma immediately following cataract extraction, and, in the same category, those sudden outbreaks peculiar to men of strenuous habits in middle life. He admitted that there are isolated instances, and suggested as a working hypothesis that the miotics tided over a condition which he had designated, for want of a better name, "a threatened reversal of ocular metabolism."

In assigning this hypothesis through analogy he had found much similarity to the experience of the investigators who

were laboring to solve the problem of sympathetic ophthalmia. In the latter affection he noted that every avenue of communication had been searched to find the route of infection, and with no invariable result; that this line of investigation had failed to account for the fact that a large number, possibly a majority, of those having dangerous wounds remained indefinitely immune. It was not until Elschnig, impressed by the association of autointoxication with similar ocular conditions, conceived the idea that sympathetic ophthalmia had an extraocular origin and reported his observations, that we obtained a logical or comprehensive view of the sympathetic process. In the consideration of the possibility of the extraocular origin of glaucoma the essayist called attention to the fact that autointoxication had apparently been responsible for sudden failure of vision, without observable tissue change, in some cases of the noninflammatory variety. At the Denver meeting of the American Medical Association, 1898, in a symposium on amblyopia, he reported a series of cases attributable to autointoxication. This report, he believed, was one of the earliest contributions to the subject in this country. The product of this intoxication, he held, was a nerve explosion, which writers refer to as profound emotion. On this basis he explained the glaucoma after cataract extraction and in the man of strenuous life, the victims of exhaustion. In the latter, if we relieve him of his business cares and clean out his alimentary canal, we get results with miotics. In a similar way he believed the successes reported by the older writers from the use of calomel and opium and the salines may be explained.

From these suggestions about the origin of glaucoma, it naturally follows that its medical treatment is practicable only in the presence of the disturbed nerve function and before a reversal of metabolism is established. In his opinion the medical treatment of chronic glaucoma has not been without merit and that there is to be a more comprehensive practice of it in the light of new findings hardly is to be doubted.

Dr. Charles H. Beard, in presenting the

Surgical Treatment of Chronic Glaucoma

laid emphasis on the point that surgical measures should be resorted to only when less radical measures are clearly contra-

indicated or have failed to accomplish the desired result. The surgical measures available, he divided into two great classes, viz., the intraocular and the extraocular. Some of these measures have merely the relief of pain as their object, but the majority of them contemplate the reduction of intraocular tension; which is the predominant symptom of the disease and the source of most of the morbid manifestations.

The intraocular operations comprise four methods: First, operations on the iris, designed to free the iris angle from adhesions between iris and cornea and reestablishing the communication between anterior chamber and Schlemm's canal. Second, the various forms of anterior sclerotomy and sclerectomy, which aim to create drainage channels between anterior chamber and the subconjunctival tissue. Third, establishing a passage for the interchange of fluids between anterior chamber and perichoroidal spaces. Fourth, promote anastomosis between the deep blood vessels of the pericorneal region and those of the conjunctiva and the subconjunctival tissues. The primary object of these various procedures, accomplished either by incision, excision or tearing away, is the restoration of normal filtration or the substitution of artificial or vicarious filtration. In discussing iridectomy as a measure for the restoration of normal filtration, Dr. Beard called attention to the prevailing opinion of ophthalmologists that this procedure cannot be depended upon to afford relief in cases of chronic glaucoma, but that it acts most favorably in the comparatively early stages of simple glaucoma; in those cases where excavation of papilla is not well established; in those characterized by considerable hypertonicity of globe or marked fluctuations in the tension, with accesses of pain, rainbow vision, by inroads upon the visual field and varying sectors of suppression of the peripheral light sense. He enumerated as positive contraindications to iridectomy cases in which the glaucomatous process had been insiduously progressive with a marked contracted field, the patient being unable to read fine print connectedly and the nerve head changes well advanced.

He emphasized the importance of frequent and close observations of the visual field, and regarded any form of surgical intervention dangerous when the retraction nears the center at some point. In the consideration of anterior sclerotomies and sclerectomies, the essayist reviewed the origin of these pro-

cedures, beginning with von Graefe, who, having observed how frequently antiglaucomatous iridectomy was followed by a cystoid cicatrix, conceived the idea that this spongy tissue, by permitting the aqueous to filter slowly through, might exert a favorable influence upon intraocular tension. Von Graefe, later, however, came to the conclusion that such cases gave no better results than those in which healing had been prompt and uncomplicated. De Wecker's and Stellwag's theories were also dwelt upon at length by Dr. Beard. He recognized the fact that a cystoid scar, with or without participation of the iris, will often serve to regulate the tension; but pointed out that when the iris is incarcerated the cicatrix may as a source of irritation lead to loss of the eye, the development of a sympathetic inflammation, and is exceedingly vulnerable to infections from the conjunctiva or lacrimal canal. Such hazards, he pointed out, were the chief objections to all procedures designed to intentionally incorporate the iris in the cicatrix. The great desideratum he conceived to be the creation of a more or less permeable cicatrix that shall be safe and lasting. Of the various procedures suggested, the least complicated and the least harmful of all, in his judgment, is simple anterior sclerotomy. He reviewed in detail the technic of simple anterior sclerotomy according to the method of Stellwag and de Wecker. He called attention to the almost unanimous opinion of ophthalmic surgeons that it is unwise to make large incisions or openings, whatever their nature, about the base of the cornea, in chronic glaucoma. The large openings are not more efficacious than smaller ones, and with the larger complications are more frequent, the iris likely to fall into the wound, vitreous to escape and high astigmatism develop. In discussing the combined anterior sclerotomy, he referred to the advantages of conservation of the sphincter of the iris in performing the iridectomy. He considered it highly desirable to have the innermost zones of iris intact; the pupil, in such instances, responding better to miotics. Of the various procedures of anterior sclerotomy the essayist dwelt in detail upon two, the method of Herbert of Nottingham and that of Bjerrum of Copenhagen. Discussing perforating sclerotomy, he reviewed the operation of Lagrange and Holth. In considering the methods of trephining the sclera, he described in detail the Elliott procedure. In this method, the spot selected for trephining should be as

close to the limbus as possible; if this cardinal rule is disobeyed, two dangers confront the operator: (1) He is much more likely to have an escape of vitreous than if he obeyed the rule, and (2) he will probably fail to enter the chamber with his trephine and will have to burrow his way into it by the aid of a curette or other instrument; in so doing, he will probably, if not certainly, injure the ciliary body. As a complication when working with a small trephine, he mentioned that occasionally the excised disc dropped into the anterior chamber. Young has suggested passing a loop of fine thread by means of a tiny curved needle, through the center of part to be excised and passing ends through hollow handle of trephine. Dr. Beard presented a drawing of a trephine, original with him, which provided for a central member either with barbed spear or a screw end, for fixing the instrument, steadying the trephine and preventing the excised disc from dropping into the anterior chamber. Of the operation to establish communication between the anterior chamber and the perichoroidal spaces he referred to the cyclodialysis procedure of Heine. Clinical data, he stated, show that favorable results of cyclodialysis have been obtained in relatively few cases; that they are seldom lasting, and that complications are, perhaps, more frequent after this than after most of the antiglaucomatous operations. Discussing nonperforating sclerectomy, the essayist described the theory and method of its chief exponent, Bettremieux of Roubaix, France. As to posterior sclerotomy, Dr. Beard considered it only applicable to blind eyes with enormous tension, effacement of the anterior chamber and atrophy of the iris, with maximum pupil. In reviewing the extraocular operations, he referred to Jonesco's extirpation of the superior cervical ganglion, Bardal's elongation by plucking out of the external branch of the nasal nerve, Roemer's extirpation of the ciliary ganglion and opticociliary neurotomy.

Discussion.—Dr. H. W. Woodruff, in opening the discussion on Dr. Fischer's paper, said: The experiments which Dr. Fischer has performed are very interesting and valuable, especially to oculists. Any of us, though we are not physiologic chemists, can readily appreciate that the variable affinity of colloids for water must have something to do with the pathogenesis of glaucoma. Since he was not enough of a chemist or physiologist to discuss the subject to any profit from Dr.

Fischer's standpoint alone, yet without being able to prove his contention, he felt certain that there may be cases of glaucoma due to a development of certain acids and a consequent absorption of water as has been shown. there is at least one theory which is worthy of notice. If every case were due to the absorption of water, then any case should be relieved by subconjunctival injections of solutions of sodium citrate. He had been using this solution since Dr. Fischer's first publication with marked results in some cases and no results in others. He called attention to Henderson's theory, which accounts for hypertension in an eyeball by two causes: First, a sclerosis of the pectinate ligament, or, as he calls it, the cribriform ligament, which lessens the ability of the aqueous to escape to the canal of Schlemm; and second, an increased blood pressure within the eye. With only one of these conditions present there will be no glaucoma, but with both present, hypertension is the inevitable result. Dr. Woodruff exhibited a chart, explanatory of Henderson's theory. The Henderson conclusion is, therefore, that there is a predisposing factor, which is the sclerosis of the cribriform ligament, and an exciting and variable factor, which is the circulatory pressure. Is it not possible that whereas Fischer's theory will explain the most acute attacks of glaucoma, Henderson's theory will better explain the most chronic and less inflammatory forms?

Dr. J. E. Colburn, in opening the discussion on Dr. Young's paper, said: The treatment of glaucoma should begin before the glaucoma occurs. There are certain eyes and certain conditions of the circulation that tend to produce glaucoma. When these conditions are known to be present, or any other condition is known to exist that might favor the development of glaucoma, we should direct our treatment toward them, so that the patient's health may be put on the proper plane. Even before any sign of arteriosclerosis is noted we must bear in mind that these patients are liable to glaucoma. Glasses should be ordered or a change of glasses made and a proper position as to light, etc., maintained. These patients should avoid the excitation of profound and grave emotions. They should lead temperate and regular lives. They often come for advice, but prefer to go on as they have and follow their own inclinations, hoping that they may not suffer. Therefore, it is difficult to manage these patients. Arteriosclerosis is one of the greatest

factors in the production of glaucoma. He had seen a number of cases in recent years in which glaucoma symptoms would appear, but under treatment with miotics and with proper care of the intestinal canal and general hygiene they would disappear. Dionin has been of some value in these cases. Eserin is useful in the later period of the disease. The continued use of salicylates, as suggested by Gifford, a grain per pound of body weight, and of bicarbonate of soda with an occasional dose of citrate of potassium, has given good results in the preventive treatment of this disease. However, sometimes our efforts are absolutely futile, and he has always hoped that perhaps the acidosis theory might help us out. Just now he was watching with interest a case in which for four years there had been occasional increases of tension, with all the symptoms of a chronic glaucoma. Under the wise management of a general practitioner who fully understands the conditions, they subside. He saw the patient occasionally and supervised the treatment. Sometimes there was a general ocular edema, but it disappeared under treatment, the vision improved and the corneal sensitiveness returned. During the last three months he had had only three attacks of increased tension. The underlying condition in the case is a chronic albuminuria, and back of that a sclerosis. He was in accord with Dr. Young regarding the preliminary treatment, believing that treatment prior to the attack was of the greatest value.

Dr. George H. Fiske, in opening the discussion on Dr. Beard's paper, said: What had impressed him most was that there had been so many operations for glaucoma and so few people cured. There was a time when a man was very successful in his operations for glaucoma, because in most of the cases where he did an iridectomy for glaucoma there was no glaucoma. He stated that he knew a patient operated upon by Graefe five times on both eyes in 1882 and 1883, and now had very nearly perfect sight. His vision is between 20/30 and 20/40. He remembered a paper read by Dr. Bull before the American Ophthalmological Society, in which he reported eighty or ninety cases operated upon, with practically no success. He was very pessimistic. Dr. Fiske believed in the operation, but thought it must be done early. The living of the patient and attention to all those things that help so much in the treatment of any case, such as hygiene, proper food, etc., should be an important part of the

treatment and should be carried out systematically and faithfully. He did not believe in waiting, but thought one should operate right away.

Dr. George F. Suker was particularly interested in Dr. Fischer's theory of glaucoma. This in combination with Dr. Henderson's theory will, he thought, come as near explaining the production of glaucoma as any theory we have. As far as the treatment is concerned, one is about as good as another. The results are about the same. It resolves itself into a question of etiology. The theory of acidosis appealed to him as the best. Colloids will swell in water. We could not produce an alkalinity, but we could produce a more or less acid solution. That was always brought about when there was occlusion, lack of filtration or absorption; and as soon as there is a blockage or closure of the filtration angle, it gives rise to an acid condition because of the blockage. There is a lack of absorption of water and increased tension. The arteriosclerotic condition is perhaps the most common basic cause of glaucoma. There is frequently an arteriosclerosis in the peripheral arteries, and naturally the arteries of the eye would be similarly involved, just like the arteries in the kidneys which cause a swelling of the kidney. In the eye the pectinate ligament swells, crowding forward the lens, and obliterating the angle, so that one is bound to have stasis, exudation and transudation, and then acidosis, at least locally. The tension of the globe cannot be higher than the arterial pressure, as has been determined by Henderson. He had seen these eyes that Dr. Fischer operated upon, and all his experiments resulted the same. Experimentally it is true, but practically it is a different question, because we have to deal with several conditions. The circulation of the eye is somewhat different than can be represented in a test tube. Then there is a psychologic aspect which must be considered. The sequence is increased heart beat, increased blood pressure, blockage of the pectinate angle, exudation, lack of absorption and acidosis. As far as primary and secondary glaucoma are concerned, the underlying pathology is the same. The chronic condition is a slow process and the eye gradually accommodates itself to the increased pressure the same as the brain to a growing tumor. As far as treatment is concerned, experience has shown that it is in a very unsatisfactory state.

Dr. H. S. Gradle thought Dr. Fischer was on the right track. He had had a little experience with glaucoma cases recently, which he had treated according to Dr. Fischer's theory, with almost perfect results. He would like to ask Dr. Fischer how he can explain the fact that we get a glaucoma practically only in hyperopic eyes, rarely in myopic eyes?

Dr. Thomas Faith said he would like to ask Dr. Fischer whether he believed that the increase in growth of the lens in a comparatively small eye or fibrosis of the pectinate or cribriform ligament were predisposing causes for glaucoma. He had had two experiences with the use of sodium citrate in glaucoma. One was a case of acute exacerbation in a chronic glaucoma, an inflammatory exacerbation. He did an iridectomy but got no relief. At the end of two days the tension was higher than before the operation. On the third day the wound was closed, although the line of incision seemed to be prominent. The tension was distinctly plus two. On the fourth day he began to inject five per cent citrate of soda solution. There was no reaction for two hours, and the interne said that after five or six hours the tension was distinctly reduced. The following day the tension was still above normal. On the third day he gave another injection and the tension fell to normal and remained at normal ever since. His conception of Dr. Fischer's theory is that the citrate of soda injection may be the means of temporarily reducing the tension; then if we look after the conditions which predispose to acidosis, we will probably succeed in effecting a cure. He had had a case of chronic noninflammatory glaucoma which he had watched for a long time. This patient had an acute exacerbation after an attempt to take the tension of the eye with a tonometer. The conjunctiva was so chemotic that it seemed as though the patient had an acute attack. He succeeded in reducing the tension by hot applications and strong eserin solutions, two or three grains to the ounce, but later it went up again. The patient had a high urinary acidity, so he gave her doses of bicarbonate of soda and ordered her to drink much water. The diet was modified and the tension fell to normal and has remained there although he is still using the eserin. In 1905 a man sixty-one years old consulted Dr. Faith regarding a typical chronic glaucoma in one eye. Vision was reduced to perception of light in the temporal field. The lens was clear and the pupil fairly

well dilated and immobile. He ordered eserin and watched him until May, 1807. The tension never became normal, but the eye was not painful. In six months the lens was completely opaque and tension was normal and has remained so. The eye is absolutely blind and the iris reacts only indirectly. There is not even light perception in that eye. He wondered if a swelling of the lens could account for the condition, and if a lens could swell to the extent of producing such tension and yet remain clear. It was clear so far as he could see, though he had not dilated the pupil to examine its periphery. The fellow eye remained normal as to tension, vision and fundus.

Dr. Richard J. Tivnen thought Dr. Fischer had done an immense amount of original work and he was glad to have heard his instructive paper. While his theory might not be the correct one, yet his work could not fail to be of value. He had used the sodium citrate therapy which Dr. Fischer advocated, with varying results. Some patients reacted pretty well; others did not. All told, the treatment did not seem to fill the gap that he had hoped it would. Dr. Fischer's theory is that glaucoma is produced by an edema which is increased by acid conditions and lessened by an alkaline condition. His explanation and demonstrations seem convincing, but the clinical data, supplied by numerous observers, covering a variety of glaucomatous manifestations, is still wanting. These clinical data, after all, are the final test. The Henderson theory in conjunction with Dr. Fischer's seemed to him to be a more rational explanation of the etiology of glaucoma than any other hitherto advanced.

Dr. Martin H. Fischer, closing: Henderson's theory of glaucoma is essentially a blood pressure theory and is, therefore, open to all the objections that may be raised to such. His model is very pretty, but he has not shown that it is identical with what we have in the body. No one has ever proven that an increased blood pressure, provided it is not accompanied by defective oxygenation of the blood, leads to edema, or that obstruction in the lymph channels or a number of lymph channels, or the thoracic duct, gives rise to edema. Pure blood pressure increase never leads to edema, provided it is produced with arterial blood. High blood pressure prevents edema. It makes life possible in organs affected with arteriosclerosis, and when it falls, in the eye for example, it is a sure way of

precipitating an attack of glaucoma or of producing an exacerbation in cases of kidney disease. Decrease of blood pressure (except so far as hemorrhage is concerned) is more dangerous than an increase. As to why we have glaucoma in hyperopic eyes, more than in others, he did not know, but ventured the opinion that the associated eyestrain is a factor. Sclerosis of the cribriform plate is, as he has said, a result—not the cause—of glaucoma. Iritis and subsequent scarring lead to a defective circulation in the eye, and thus tend to favor the maintenance of glaucoma. Priestly's theory that an increase in the size of the lens is responsible for a glaucoma, is, he thought, a case of looking on the effect for the cause. The increase in the size of the lens is an evidence of the swelling of the lens, as can be seen in any experiment on the eye. The acid accumulation in the eye which makes the whole eye swell, also makes the lens increase in size. The filtration hypothesis has been discussed in conjunction with edema anywhere in the body. In the eye, in glaucoma, it is simply a local problem. The question of filtration is a question in physical chemistry. We cannot even filter water, let alone any colloid substance, through such colloidal membranes as we find in the body with anything like the pressures available here. The maximal values available in the body are 200 or, in extreme cases, less than 300 mm. of mercury. But to accomplish filtration we need several atmospheres, in other words, several times 560 mm. Where does the increased amount of albumin in the eye in glaucoma come from? It is analogous to the albuminuria of acute nephritis. We call it albuminuria when it comes from the kidneys, and an increased content of protein in the fluids of the eye in glaucoma. In both cases the proteins of the involved tissues go into solution in consequence of the increased acid content in the tissues. As to treatment, we agree in fundamentals. What is best done in a given case depends upon what we believe to be the underlying etiologic factors in the production of the acid accumulation, and any remedy is good or bad as it helps or fails to remove these underlying etiologic factors. De Wecker and Stellwag said that the more acute the attack of glaucoma the better the prognosis. Dr. Fischer had made exactly the same statement regarding nephritis, and the treatment of it had suggested the same thing as for the treatment of glaucoma. Give alkalies; give salts; give water. The rea-

sons are obvious. It is the same story as in glaucoma. Surgeons have decapsulated the kidneys to relieve a nephritis. That helps in many cases. On the other hand, we can help our nephritis quite as well by using alkali and salts. The old doctors gave salt by mouth and by the bowel, and in large doses. We give alkali in addition. Whether we relieve a case of glaucoma permanently or not depends on the underlying etiologic factors. If we have a syphilitic iritis with a secondary glaucoma, or an injury to the eye, the thing is to tide the man over the glaucomatous attack, and it makes no difference whether we stick a hole in the eye to reduce the tension or give sodium citrate subconjunctivally, or neutralize our acid effect in some other way. If we hold the tension down for two or three days, the etiologic factors responsible for the acid accumulation depart, and that is an acute case; no matter whether it was iridectomized or sclerotomized or treated with sodium citrate, it is synonymous with permanent relief of the glaucoma. On the other hand, if arteriosclerosis is the causal condition, we have a chronic case, and nothing in the way of treatment locally can as permanently relieve the condition. We must institute general treatment. The prognosis is the same as in kidney lesions. An eclamptic woman who bears her child and whom we tide over the puerperium is a saved woman. The woman with a chronic interstitial nephritis secondary to arteriosclerosis and with a failing heart will produce enormous quantities of acid, and we have to stay by her bedside all day to keep her sufficiently alkalinized and can only expect the most temporary relief, for a dying heart is not restored with alkalies and salts. The use of sodium citrate in subconjunctival injections is not a cure for glaucoma. It can never be. If the tension can be kept down so that we can save the eye temporarily and prevent another attack, the treatment has served its purpose. Sodium citrate simply reduces the tension. He had been interested to hear the reports of its use by others. He had not seen a single case where the tension did not come down. Sometimes druggists make a mistake in putting it up. They think the doctor has made a mistake in ordering so strong a solution. If sodium citrate is given, enough must be used. Gently distend the subconjunctival tissues. If the sodium citrate gets into the eye, the tension has to come down. The only condition Dr. Fischer could conceive where it will not come down is where

there is an obstruction in the circulation of the eye of the gravest character, or where the acid content is so high that the water gets into the eye out of the citrate solution before the salt itself. Another condition would be a systemic cause for the glaucoma, such as a heart or a blood vessel lesion of such a character that the generalized acidosis is so tremendous that local treatment is not enough. Then the case must be treated systemically, just as a case of acute nephritis. The experience of the last few months had convinced him that it is as well, if not better, to treat all glaucomas systemically by using alkaline hypertonic salt solutions by rectum. In this way we raise the alkali salt content of all the tissues of the body, including those of the eye, and so they all shrink and our glaucoma disappears even without the use of any local measures.

Dr. H. B. Young, closing: We are not so far apart, after all. My own theory may be a little fine spun, perhaps. The point I wish to make is that originally there must have been some nervous disturbance, such as we see with autointoxication amblyopias which affects primarily the circulation of the uvea. I have not had enough opportunity to observe glaucoma and get extensive data. I argue by analogy and the cases I have seen relieved permanently. The only difficulty, to my mind, in the acceptance of the acidosis theory is the appearance of monocular glaucoma. I have also seen one case of glaucoma in a myopic eye, a man eighty years old, who is to be put on the alkaline treatment, although having very little pain or disturbance. The use of eserin or any miotic has been followed by an exacerbation of the condition.

Dr. Charles H. Beard, closing: All these measures have been attended by satisfactory results, but he was a great believer in simpler measures, simple incision into the anterior chamber, for example, but always followed by pressure massage. The operation starts the curative process, and gets the eye in a condition so that miotics and massage may be effective. He had had a case of juvenile glaucoma under observation for many years, in which he made several incisions at the base of the cornea through the same spot, and succeeded in reducing the tension, but it did not remain down. Lately the patient had been taught how to make the pressure massage and knows when she has reduced the tension. She also knows by

the symptoms when to resort to the massage and can thus maintain a safe intraocular tension. Sclerotomy is a formidable operation, and there are apt to be iris complications, loss of vitreous and such things. That is why he prefers simple punctures of the anterior chamber, by long slanting incisions through the sclera into the iritic angle, followed by pressure massage. He considers that the best surgical treatment for chronic glaucoma.

Meeting, October 21, 1912. Dr. Thomas Faith, President, presiding.

A Case That Had Recovered from Sympathetic Inflammation with Normal Vision.

Dr. W. A. Fischer stated that the case was presented to the society three years ago at a symposium on sympathetic inflammation with a vision at that time of 3/200. The history of the case is as follows: Elmer B., age 11, was struck in the right eye May 17, 1907, with a piece of copper. Dr. Fischer saw him July 17, 1907, two months after the accident. The right eye was hopelessly blind and there was a well-marked sympathetic inflammation in the left eye. The right eye was removed within an hour. Patient was put in bed, given eliminatives, and as his weight was about seventy pounds he was given 70 grains of salicylate of soda every twenty-four hours, which gave him no annoyance. Two drops of 2 per cent atropin was instilled into the left eye every four hours, and hot applications applied. The left eye was much better the next day after the removal of the right eye, but there was no vision on account of the dense exudate in the pupil. The pupil would not dilate and an iridectomy was performed July 30, 1907, to reduce the tension. The tension was reduced by the iridectomy, but did not entirely disappear. August 30, 1907, one month after the iridectomy and two months after the removal of the right eye, the left lens was removed on account of the tension. September 30, 1907, one month after the removal of the lens, the eye was practically quiet and remained in a semiquiet condition for several months. From May, 1908, until May, 1910, the eye remained quiet, the tension was about minus one. His vision during this time was about 3/200. The pupil was drawn up and practically closed. May 20, 1910, two years after the inflammatory symptoms had disappeared, an iridectomy was

performed by Ziegler's method with a very sharp Ziegler knife. A large pupil was made and has remained opened as you see it tonight. He was kept in bed after the operation, eliminatives and large doses of salicylate of soda given, atropin 1 per cent and dionin 10 per cent instilled in the eye four times a day. His vision soon began to improve, and as the vitreous began to clear up his improvement was rapid. August 20, 1910, three months after the iridectomy, vision had increased to 20/65 with correction. From this time on the improvement was slow but sure. November 20, 1912, his vision was 20/40. Tonight the eye is perfectly quiet, has not given him any trouble for more than a year. His vision is 20/20, and he can read Jaeger No. 1. The excellent result obtained may be attributed at least in part to the iridectomy being performed two years after the inflammation had subsided.

Discussion.—Dr. W. F. Coleman had seen many disastrous results in the loss of the sympathizing eye. In 1887 he reported twenty-eight cases of sympathetic ophthalmia. He had removed sixteen eyes. In twelve cases he advised removal, but it was refused. In earlier experiences, blindness resulted in the other eye in at least six cases because his advice to enucleate had not been taken. The late Dr. Noyes hesitated to remove an eye lost from a perforating wound of the sclerocorneal region, because in the laboring class it is a serious matter to renew an artificial eye. Dr. Coleman advises removal of all eyes where the wound is so serious as to cause prospective loss of vision to the patient, not only because of danger to the fellow eye, but for cosmetic and economic reasons. A blind eye is so deformed that an artificial eye improves the appearance, and the patient is capable for all unskilled labor. If the fellow eye is inflamed, would you remove the injured eye? In three cases among his twenty-eight in which he had removed the injured eye with the presence of sympathetic inflammation and serious visual loss in the other eye, the vision in the sympathizing eye was quadrupled. So that in his experience, removal of the injured eye is of decided advantage. As to the etiology of sympathetic inflammation, it would be presumptuous to question the dictum of the bacteriologist. Adami and others maintain that inflammation may occur without infection, so that Dr. Coleman thought sympathetic inflammation might occur without infection. In the

last ten years he had seen two cases of sympathetic ophthalmia, probably because of the antiseptic treatment of the injured eye, but he thought it possible for the eye to sympathize without infection. A patient of his had had an injury of his right eye forty years previously. He had 20/200 vision in the fellow eye, an optic neuritis was present, and he concluded it was sympathetic. Dr. Coleman advised removal of the injured eye. Within a week the fellow eye had 20/20 vision. Is it probable that autoinfection occurred after forty years, and the occasion for the infection had never occurred before? So far as he knew, the actual bacterial cause of sympthetic ophthalmia had not yet been discovered. Brown Pusey, E. V. L. Brown and others maintain that it is infectious. Others maintain that it may be due to reflex irritation. Years ago, Hulings Jackson held that a nervous irritation maintained long enough produces a reflex inflammation. Dr. Coleman thought we go a little to extremes in the laboratory idea; that we are forgetting clinical experiences.

Dr. O. Tydings had had no idea until tonight of the result of the treatment in Dr. Fischer's case. The last time he saw the patient was after an iridectomy had been done, and the eye was still red. He saw it quite frequently from the beginning of the trouble until within the last year, when it looked to be a hopeless case of sympathetic ophthalmia. This result should be an encouragement to all of us, and Dr. Fischer is to be congratulated for obtaining such a result. It shows what skillful and careful work can do for an eye. It is a beautiful result, for 20/20 vision is as much as any of us have.

Dr. William H. Wilder agreed with Dr. Fischer, that operation should not be done until the eye had remained quiet a long time. The temptation is to attempt an iridectomy too soon after the subsidence of the inflammation, and when it is done, however neatly, we are surprised to find that the coloboma quickly fills up with exudate and possibly the inflammatory process again arouses deeper structures. He makes it a cardinal rule in such cases to wait two years, at least, after all signs of active inflammation have disappeared before attempting iridectomy or removal of the lens. If the lens has remained clear, an iridectomy may suffice, but usually it is found necessary to remove the lens, and if so, he prefers to do the iridectomy and the extraction at the same time, so as not

to subject the eye to the irritation of two separate operations. He congratulated Dr. Fischer on the excellent result obtained in the case, which goes to show that the inflammatory process had expended itself on the anterior portion of the uveal tract and that the vitreous chamber had remained comparatively free.

Dr. Oscar Dodds said that when Dr. Fischer presented his case before the society the first time, he had also presented a case of sympathetic ophthalmia in which the outcome was not so successful. The failure in his case was due to the fact that each time he had the child under treatment the parents would take her home as soon as the inflammation had subsided, and each time she returned with the eyes in a much worse condition. Early operation is certainly contraindicated. He remembered one case years ago in which Dr. Fischer advised him to operate. A boy, ten years old, had the most severe case of sympathetic ophthalmia that he had ever seen. There was a large exudate behind the iris which looked like an iris bombe. Dr. Fischer thought it advisable to remove a piece of the iris, which he attempted to do, but found it so thoroughly bound down that it was impossible to cut even a small piece without removing the lens and the entire exudate. It is always a question what to do in these cases, because of the tension; in some it is impossible to restore sight because of the disastrous results from secondary glaucoma. The case he mentioned terminated in this way, so that there was not even light perception after a time.

Dr. Sidney Stephenson reported several cases in which he had had good results by doing a small needling which did not disturb the iris; simply stirring up a layer of the lens and irrigating the anterior chamber thoroughly. In that way he prevented reaction and had satisfactory results. He also congratulated Dr. Fischer on his good result.

A Case of Monocular Optic Atrophy Following an Injection of Olive Oil and Lanolin.

Dr. W. A. Fischer stated that the case presented itself to the clinic at the Chicago Eye, Ear, Nose and Throat College with a well-marked atrophy of the optic nerve of one eye and the following history: About ten weeks ago a doctor injected olive oil and lanolin under the skin of the forehead, for

the removal of a wrinkle or frown. The injection was made at 10 a. m., and the patient stated she was unable to leave the doctor's office until 2 p. m., having vomited several times. About five days after the injection she noticed that she could not see; the blindness was complete and the eye has remained blind since that time. The injection was not hot, but of the temperature of the room.

If an injection of this kind under the skin was a common cause of optic nerve atrophy, we would have many cases of atrophy of the optic nerve. No doubt many members of this society have injected olive oil, lanolin and paraffin with varied success, but Dr. Fischer had never heard of a case of atrophy of the optic nerve following such injections. If this were a cause, it is very uncommon. It is possible that some of the injected fluid could pass into the orbital cavity and make pressure upon the optic nerve. When we have optic neuritis we should always examine the ethmoid cells and sphenoid sinuses. We know that suppuration of the frontal sinus might pass to the ethmoid cells and cause pressure of the optic nerve. When injections are made around the eyes, pressure should always be made at the inner canthus at the time of the injection and for some time after, to prevent the injected fluid from entering the sinuses of the face.

The condition of the eyes is as follows: The left eye presents a picture of atrophy of the optic nerve. The pupil of the left eye does not contract when a strong light is thrown into it, but does contract when a strong light is thrown into the right eye. The nerve is white, the edges are sharply cut, and well defined arteries are contracted; other than this the ophthalmoscopic findings are negative.

Dr. Thomas Faith saw a statement the other day which he believes was made by Lawford, and which was to the effect that the location of the injury to the nerve could be determined to some extent by the time at which the blindness and atrophy of the nerve occurred, viz.: When the injury ocurs in front of the point at which the artery enters the nerve, the blindness will be immediate and the pallor of the nerve head will be at once noticeable. Where the injury occurs back of the point of entrance of the artery, the fundus may retain its normal appearance for several weeks after the injury; the blindness sometimes coming on immediately and sometimes being delayed for a time, but always preceding the

symptoms of atrophy. He could readily understand how a particle of this injected material could have been forced beneath the periosteum, and if considerable force were used, could have dissected its way under this membrane into the orbit. He had made quite a number of injections of paraffin under the periosteum of the nasal septum for the relief of ozena, and had been very much surprised at the rapid way it sometimes dissects its way along.

Dr. Joseph C. Beck was much surprised in this case. It is very easy to understand that if one takes a long needle and passes it directly next to the eye and injects a large quantity of paraffin that it will compress the optic nerve and make trouble. In over three hundred injections in different individuals around the nose where the eyes would be endangered, he had never had such a result. So far as the literature is concerned, he can assure Dr. Fischer that there is no authentic case to prove that anything like that can result from paraffin injection around the eyes, and he was certain that this result could not have been from that cause. The condition of the nose was not given. Simple inspection of the nose could not show the presence of sphenoiditis. Nothing short of an operation on the sinus, removal of the middle turbinate and opening the sphenoid sinus would prove that this was not such a case.

Dr. O. Tydings hoped that some anatomist will trace the trouble of probable course of that fluid so that it would produce the pressure that led to the optic atrophy. It must be exceedingly rare. He did not recall ever having seen or heard a report of such a case.

Implantation of Glass Sphere Into Capsule of Tenon.

Dr. George F. Suker presented a negro child, aged three years, who had had a large sclerocorneal staphyloma, preventing closure of lids. Enucleation was difficult because of adhesions. A lead-free glass sphere was inserted into the capsule of Tenon and covered by conjunctiva and deep muscles, closed with catgut sutures and a continuous silk purse string suture through the conjunctiva. Reaction sufficient to preclude any great motion of stump, although there is a full socket preventing the sinking in of the prothesis. Dr. Suker believes that sockets, in children, in which a globe has been

transplanted, grow more nearly to normal size than those in which the same is not done.

Discussion.—Dr. W. F. Coleman did not have quite so good a result as Dr. Suker had. He had one-case of sympathetic ophthalmia from the implantation of a glass ball in Tenon's capsule. He collected seventeen similar cases from the literature. Fox reported three cases occurring in his own practice following the implantation of a gold ball, which he prefers to the glass ball. Dr. Coleman said he would never implant a globe of any kind, but preferred to use either the Snellin eye or inject stearin.

Dr. Wm. H. Wilder said when he observed the case of implantation of a glass ball in the capsule of Tenon, he could not help asking "of what good is it?" There is not as much motion of the contents of the socket as there would have been if the ball had not been implanted. He advised keeping within the capsule of Tenon, because the socket heals more promptly and the stump moves more readily. He spoke of the use of fat implanted into the capsule, and said that he had seen some encouraging cases in Elschnig's clinic. He doubted that the results obtained by implantation offset the dangers of subsequent irritation.

Dr. Thomas Faith said he was not an advocate of the glass ball implantation, though he saw a case of Dr. Suker's a few years ago which was the finest result that he had even seen. The case had been operated about three months before he saw it, and the patient had not only good motion, but had apparently good convergence with the operated eye.

Dr. Geo. F. Suker, closing: Dr. Coleman cannot show a positive case of sympathetic ophthalmia due to the implantation of any sterile substance into the capsule of Tenon. It is impossible to get a sympathetic ophthalmia from any condition in a socket from which the globe has been removed. Dr. Suker looked up the literature carefully and was unable to find any record of such a case. He said that if an eye of sympathetic character were removed, a globe inserted and sympathetic ophthalmia followed, the trouble could not be considered the result of the operation. He spoke of the difficulties in the enucleation, and believed that although the socket was not movable the sinking in of the upper lid was prevented. He did not believe in evisceration and implantation in the scleral capsule.

Nuclear Paralysis of Motor Oculi.

Dr. Geo. F. Suker presented a patient, Mr. K., aged 50, German, good habits, family history negative as to syphilis and tuberculosis; married, family grown; a painter for the past fifteen years; working in lead and water colors; had lead colic and moderate drop wrist several years ago. About six weeks ago he noticed the dropping of the left upper lid. Within twenty-four hours he was unable to raise it, which caused him to seek advice. Upon examination a complete paralysis of the third nerve of the left eye was found, fundus normal, vision 20/20; no action whatever of muscles supplied by third nerve. The ptosis was complete and lid very flaccid, all other findings negative. Under ascending doses of k. i. and Hall's solution of strychnia, improvement took place, starting in the inferior and superior recti branches. The iris now reacts to light and accommodation. The ptosis seems to be unchanged, so recovery may or may not be complete.

Congenital Cataract.

Dr. Geo. F. Suker presented a patient, Chas. H., aged 11. Bilateral congenital zonular cataract. Both lenses were needled once—one four weeks after the other. The capsule was extensively lacerated and iced compresses were used for twenty-four hours after the discission. Atropin was used daily. As soon as the reaction had disappeared, which was within a week or ten days, and the lenses became uniformly opaque, a corneal section in the lower quadrant was made with a keratome and the lens delivered. A clean and complete delivery was accomplished in each eye, with scarcely any remains of the anterior capsule but an intact posterior capsule; vision in each eye 20/15 with plus 11 and minus Jaeger 1 with plus 14, binocular fusion. The short period of time in securing the safe removal of the lens and largest share of anterior capsule is an advantage over several discissions.

Congenital Absence of Globe, Small Socket and Blepharophimosis on Left Side with a Coloboma of Iris Downward in Right Eye.

Dr. Geo. F. Suker presented the patient, Bertha B., aged 11 years, born with the foregoing conditions. The vision in right eye 20/20. No other congenital lesions in the eye excepting

a coloboma of iris about 4 mm. wide, extending from pupillary margin to the root of iris; the remaining uvea was not involved. Deep in the small socket of the left side, a whitish area is seen, which does not look unlike sclera, yet no mass can be outlined which might be taken for a cryptophthalmos. Parent will not permit removal in order to determine whether we are dealing with a case of anophthalmos or cryptophthalmos. Plastic measures are being employed to enlarge lid fissure in order to wear, if possible, a prothesis.

A Case of Bilateral Ptosis.

Dr. Clifford E. Smith (by invitation) reported the case of L. F., male, aged 28, who had been under observation six months. Inherited drooping lids from father. First trouble, ten years ago, was diagnosed "granulated eyelids." Patient's chief complaint has been a pain in and about the eyeballs. Has visited many specialists, getting glasses from them, but at no time has the circular pain about eyes been relieved. Denied lues. At present patient complains of pain about eyes and inability to read over ten or fifteen minutes at a time. Photophobia, but no symptoms of lid irritation; no scratching, burning, smarting or itching.

R. V. = 20/30; — 2.00 ⌒ + 1.75 ax. 90° = 20/20
L. V. = 20/30; — 2.00 ⌒ + 1.75 ax. 90° = 20/20

Present glasses were fitted under homatropin and patient wears them constantly.

Question.—Is there a relation between the ptosis and circular pain about the eyes?

(He wears the correction for his astigmatism.)

Gummatous Scleritis—Episcleritis—Iritis.

Dr. W. H. Wilder presented case, Miss C. T., aged 21, who for the last two years has attacks of inflammation of left eye lasting from one to several weeks. First seen March 1, 1912, when a large, yellowish hemispheric nodule about 5 mm. in diameter was seen on the nasal side of left eyeball, 6 or 8 mm. from the limbus. Pupil irregular from posterior synechiæ. Tuberculin test (von Pirquet) was positive. Inoculation of eyes of two rabbits with small particle removed from the growth was negative. Wassermann test distinctly positive.

R. V. = 6/6; L. V. = 1/60. Under treatment with mercury inunction and k. i. the growth completely disappeared. Present condition: R. V. = 6/6; L. V. = F. 1 foot. Fundus invisible.

A Case of Foreign Body (Probably Copper) in Globe.

Dr. W. H. Wilder presented the case of Walter R., aged 8, foreign body in choroid of the right eye. Track of foreign body seen in the upper temporal part of eyeground, and a mass, probably encapsulated metallic fragment, seen one disc diameter from the upper temporal margin of the optic disc. Skiagraph shows foreign body in posterior part of the eyeball, but attempts to dislodge it with magnet have failed. Present condition: Eye quiet, R. V. = 6/10, L. V. = 6/10.

Case of Inversion of Iris and Partial Dislocation of the Lens.

Dr. Charles G. Darling presented the case of Mrs. C., aged 52. The left eye showed corneal ulcer near margin, inversion of iris and partial dislocation of lens. Patient said that forty-five years ago she had had a blow on her left eye, pupil had been large and she had not seen well with eye since then. One would expect to find the lens opaque after being partly dislocated for so many years. The fundus can be plainly seen; there is a rupture of the choroid and a circumpapillary atrophy of choroid. Tension is normal. L. V. equals hand movements.

Case of Probable Tubercular Scleritis.

Dr. Charles G. Darling presented case of Mrs. C. C. History negative except that she has nursed husband past two years, who is at home with pulmonary tuberculosis. First seen September 18th. Examination showed a marked scleritis of left eye, with involvement of ciliary body, iris and cornea. An injection of 1/1000 mg. of T. B. was followed by a local reaction twenty-four hours later; all the following injections, about a dozen in number, given at intervals of four or five days, were followed by a local reaction. The case has improved under treatment of injections of T. B. and local use of atropin, dionin and hot applications. As the patient had a local reaction in the left eye following every injection of T. B., Dr. Darling believed the case to be one of local T. B.

Penetrating Injury of Globe by Fragment of Copper, Followed by Loss of Eye.

Dr. Charles G. Darling reported case of a young man, aged 14, hit in the right eye while passing some boys throwing stones at blank cartridges. On examination three days later he found a cut in cornea; the fundus could not be seen on account of a traumatic cataract. X-ray picture taken by Dr. Potter located foreign body at posterior pole of eye, partly sticking through sclera. After cutting external rectus and rotating eye as far in as possible, foreign body could not be felt or seen at posterior pole of eye. Eye was removed and foreign body found to be of copper and in the position shown by X-ray.

A Case of Persistent Pupillary Membrane.

Dr. Casey A. Wood (presented by Dr. Rochester for Dr. Wood) reported a patient, 29 years of age, who had never been aware of the abnormal condition of his eye. He presented himself for treatment because of symptoms brought on entirely by his high degree of hypermetropia. No history of iritis or any other inflammatory disease of the eyes. Examination disclosed a small band of tissue running from the anterior surface of the iris, looping well forward into the anterior chamber and attaching itself to the lens capsule. The point of attachment on the iris is well back from the edge at the region where the embryonic vessels for nourishing the pupillary membrane formerly arose. At the point on the anterior capsule where the final attachment is made is seen a small white deposit, probably a remnant of the fetal vascular capsule of the lens.

An Interesting Case of Primary Glaucoma.

Dr. Thomas Faith presented case of Mrs. J. H., aged 29, of Swedish parentage, and apparently in good general health. Was first seen on September 30, with the following history: For many years she has had occasional attacks of photophobia, but the vision has always been good until the present trouble developed. In January of 1912 she was taken with a severe headache which lasted all day, and towards evening both eyes began to pain severely and in a short time became very red and swollen. A physician was called, who diag-

nosed the condition as an attack of pink eye. Patient remained in bed constantly for four weeks, during which time both eyes remained red, the right worse than the left, and during which time she had attacks of blindness, affecting first one eye and then the other, and for one day she seemed completely blind in both eyes. During the next four or five weeks she remained in the house and was seen by two different physicians—the treatment of the eyes seemed to be always the same. Finally the left eye began to clear up and the right eye remained red for about three months. At this time she was taken to a local optician, who prescribed glasses which were changed five or six times. Nothing in the way of local treatment was given until about September 1st, when the patient came under the care of Dr. Abernathy Graves of this city. Dr. Graves immediately made a diagnosis of glaucoma and began treatment with miotics. At this time eserin in most any strength caused so much discomfort that Dr. Graves referred the case to Dr. Faith for further treatment. When first examined on September 30th, Dr. Faith found R. V.—light perception only; L. V., 20/50. Right pupil widely dilated and inactive. Tension right eye, with palpation, plus two; with the Schiötz tonometer, 70 mm. Hg. Marked glaucomatous excavation of optic nerve, slight beginning lens opacity, the anterior scleral veins were distended and tortuous, though the sclera seemed unusually white. Could not take the field. The left eye showed the pupil dilated more in the vertical than in the horizontal meridian, reaction sluggish, anterior scleral vessels engorged, anterior chamber shallow. Tension with palpation plus one, with the Schiötz tonometer 42 mm. Hg. Distinct glaucomatous cupping of the nerve head. Complete urinalysis was made and showed deficient quantity, about forty ounces in twenty-four hours; specific gravity, 1,015; urea, 1.1 per cent; total solids, 3.4 per cent; acidity, 27 degrees; a trace of albumin; a trace of bile; no indican; hyalin casts; a few red blood cells and a few pus cells. The patient's blood pressure at this time was 110 to 120. Her digestion was apparently normal, and menstruation normal but scant. A two grain to the ounce solution of eserin sulphate was ordered, but could not be used on account of pain which it produced; it was then reduced to one grain, which also caused pain, and had to be further reduced to one-half grain to the ounce. This weak

solution was tolerated, but seemed to have no effect on the pupil or tension, particularly in the right eye. The visual field taken at this time showed practically no change. Also the tonometer reading, which was 40 to 42 mm. Hg. in the left eye and 68 to 70 mm. Hg. in the right. On October 10th he injected 15 m. of a 5 per cent solution of sodium citrate under the conjunctiva of the left eye, and on the 11th the same amount was injected in the right. The immediate effect of these injections was a lowering of the tension in both eyes. The right tension being lowered to about 52 mm. and the left to 25-27 mm. These injections, however, were so painful that the patient begged to discontinue them, which was done. Eserin solution was again used, one grain to the ounce, without any discomfort. Both pupils were much smaller, that of the left eye being almost normal. The patient was more comfortable than at any time since the trouble began. The vision, right eye, is now, October 19th, hand movements at 10 feet, October 21st, —20/200, and the tension October 19th in the right eye was 60 and in the left eye 27, and at last reading was 37 mm. The vision in the left eye is 20/30, and the tension at last reading was 20-22 mm. Dr. Faith had promoted elimination constantly by the use of phos. sodii and lithium citrate. What further treatment should he adopt, if any, and should he operate? There are several interesting features in connection with this case. First, the age. According to Dr. Knapp's tabulation, he found in 352 cases the following results as to age:

From 10 to 20 years, 3 cases.
From 20 to 30 years, 11 cases.
From 30 to 40 years, 28 cases.
From 40 to 50 years, 60 cases.
From 50 to 60 years, 130 cases.
From 60 to 70 years, 89 cases.
From 70 to 80 years, 28 cases.
From 80 to 90 years, 3 cases.

This patient then is young to have glaucoma, and according to Knapp's table comes within the group age which comprises 3⅛ per cent of the entire number of cases. Then of considerable interest is the kidney findings, which show that we have either a renal insufficiency, a slight nephritis, or a renal edema, and which bears out the ideas of a number of observers who

believe that glaucoma is nothing more than an edema in a closed cavity and that the hypertension is only a symptom and not the disease itself.

Discussion.—Dr. William A. Fischer: Dr. Faith's inquiry, whether he should continue with the eserin or whether he should give more citrate of soda, seems an easy problem. Dr. Faith said that the citrate of soda put the patient in a condition where the eserin gave him good results, and the eserin did not give the good results before the citrate of soda was injected. The only reason he discontinued the citrate of soda was on account of the pain following the injection. In painful cases, such as this one, there is no harm in injecting a weak solution of cocain under the conjunctiva before injecting the citrate of soda and then continue the eserin if necessary.

Dr. O. Tydings has used citrate of soda with good result in a case of traumatic glaucoma, but the first thing he knew he had had an increase of tension, and he has been a little more careful with it since. He had a case of glaucoma in a patient younger than Dr. Faith's patient. She reported that she had been blind for two years following the fitting of a pair of spectacles. The patient was 24 years old and had been blind in the right eye for two years from glaucoma; the left eye was beginning to be affected.

Penetrating Wound of Sclera-Cornea Repaired With Conjunctival Flap.

Dr. Richard J. Tivnen presented a case of a man, aged 24, who one month previously had received a penetrating injury from a piece of steel at the sclerocorneal junction about at the inferior pole of the vertical meridian. When patient was seen four days later, examination disclosed an incised wound with an incarcerated iris and a minute opening at the lower angle of the wound through which the vitreous oozed. Radiograph and electric magnet negative. History also clearly indicated that the foreign body was not retained in the globe. The wound was repaired by dissecting a conjunctival flap around the entire circumference of the cornea, drawing this over the wound and securing with a purse string suture. The patient was exhibited as an illustration of the satisfactory results one may obtain in utilizing a conjunctival flap as a splint and protection against infection in this class of injuries.

Case of Penetrating Wound of Cornea, Followed by Traumatic Cataract.

Dr. Richard J. Tivnen presented a case, L. J., who about two months previously, while at work, was struck in the right eye by a piece of steel. Examination of right eye, twenty-four hours later, disclosed incised wound of sclerocorneal junction, nasal horizontal meridian, 5 mm. in extent. The iris was incarcerated in the wound. The lens was cataractous and some of the swollen lens material was present in the anterior chamber. While the history pointed to the absence of a retained foreign body, a radiograph was taken and the electric magnet applied; both with negative result. Perception and projection, excellent; tension, normal. The case was presented to gain an expression from the members as to their practice in dealing with a cataract of that type.

Discussion.—Dr. C. F. Burkhardt had had a case similar to that of Dr. Tivnen's, but there was no penetrating wound. His patient was a boy nine or ten years old. The cause of the injury to the lens was a shot from an air gun, which struck the cornea with sufficient force to rupture the lens capsule and dislocate the lens into the anterior chamber. The boy now has something like 6/20 vision with correction. Only a tiny shred remains, probably of the capsule.

Richard J. Tivnen,
Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of January 18, 1913. Dr. E. M. Marbourg presiding.

Quiet Iritis.

Dr. Otis Orendorff presented a girl of 18 years, each of whose eyes had for some time been affected by a sluggish iritis. The patient's general health had been good except for a tendency to muscular rheumatism and a liability to colds. The mother and a brother of 12 years had myopia with low corrected vision. The patient came first in July, 1912, there being slight ciliary hyperemia and a thin pupillary membrane. The pupils had dilated slightly and irregularly under mydriatics. Vision of either eye was then 8/10 with —1 D. Protoiodid of mercury and atropin had been used, later atropin and dionin, and again a vigorous treatment with iodids and salicylates. Left vision had continued to fall until it was now 1/10. The pupils were adherent to the lens capsule, and the irides were ballooned. Hypertrophied turbinates had been removed.

Discussion.—Dr. Coover: In these cases of quiet iritis, where posterior synechiæ exist, you will have recurring attacks. An attempt should be made to break up the adhesions around the pupil and do a broad iridectomy. If the separation is very difficult, break up as many adhesions as possible or as may be necessary for the iridectomy.

Dr. Aufmwasser thought the inflammation in the nose might have had something to do with the eye condition.

Several members expressed their agreement with Dr. Coover.

Dr. Black remarked that traumatic cataract was liable to result from doing the operation, but the chance must be taken.

Unilateral Exophthalmus.

Dr. Franklin E. Wallace presented a colored woman of 33 years, who had noticed a prominence of the right eye since November, 1912. The condition was said to have increased and had been associated with throbbing and occasional aching on the same side of the head. There was decided exophthalmus of the right eye, but the eyeball was otherwise quite normal in

appearance, and movements were not limited. Tension was normal. Pressure showed some tenderness. The nasal cavities, especially the ethmoid region, were apparently free from disease. Transillumination of the frontal sinuses and antrum was normal. The fundus was normal. The patient was married, but her husband was described as a "rover." Right vision was 20/30+.

Discussion.—Dr. Strickler was disposed to attribute the proptosis to some intraorbital condition.

Dr. Neeper suggested a unilateral exophthalmic goiter.

Dr. Hosmer would give iodids, on the supposition of possible gumma of the orbit.

Dr. Melville Black thought a likely cause to be a syphilitic periostitis of the lower wall of the orbit.

Rodent Ulcer at Inner Canthus.

Dr. James A. Patterson presented a woman of 58 years, at whose right inner canthus was a broad ulceration with an indurated base. The lesion apparently involved the periosteum below the inner canthus, and extended over the nasal process of the superior maxilla. What remained of the lower lid was everted, and cicatricial lines ran down the nose and across the cheek. So far as could be learned, the only treatment that the patient had had was with X-ray, over a period of two months. The patient stated that the growth had been developing for twelve years or more, but had broken down only in the latter half of that time. No grandular enlargement could be detected.

New Growth of Bulbar Conjunctiva.

Dr. J. A. Patterson presented a man of 43 years, who for the past year had noticed the development of a pigmented growth on the bulbar conjunctiva, to the nasal side of the left corneal limbus. The growth was flat, irregularly massed, and encroached slightly upon the cornea. There was increased vessel formation, but no involvement of the iris or choroid, and the patient was free from discomfort. While under examination by members, the patient stated that he had been struck in the eye with a piece of coal some time before the appearance of the growth. (But a few days after the meeting he admitted to Dr. Patterson that he was uncertain whether the

coal had struck the right or left eye, and also whether the blow had preceded or followed the first appearance of the growth.)

Discussion.—Dr. Bane thought the growth might be a pigmented sarcoma, involving the episcleral tissue. Microscopic examination was necessary. He would remove the growth and curette the limbus.

Dr. Marbourg said that if microscopic section showed melanosarcoma, he would at once enucleate the eyeball on account of the risk of metastatic growths.

Spontaneous Absorption of Traumatic Cataract.

Dr. J. A. Patterson presented a man of 21 years, whose right eye had been injured by a piece of chicken wire. The injury occurred while chopping kindling wood, and the wire, after penetrating the cornea three mm. from the outer limbus, and also the pupillary margin of the iris, had become deeply imbedded in the outer part of the lens. The wire was promptly removed by a general physician. When the patient was examined, a half hour after the accident, there was little pain, but the eye was blind, and only the inner half of the pupil was dilated. There was no fundus reflex. X-ray examination for a piece of iron in the eye was negative. The eye was kept under atropin for two months, in the course of which time the lens substance became entirely absorbed, and what remained of the lens capsule fell below, so that the pupil was clear. With correcting lens (+ 12 sph. and low cyl.) vision was 6/5.

Magnet Extraction of Piece of Iron Adherent to Uveal Tissue.

Dr. J. A. Patterson presented a boy, aged 11 years, whose left eye had been penetrated by a piece of steel or iron while his brother was striking with a cold chisel and hammer on a piece of iron. The iris and capsule had been lacerated, and the lens substance had passed into the anterior chamber. The eye was almost white and free from pain when the patient was seen on the day after the accident, and application of the magnet produced apparently no pain. Mental deficiency and intractableness of the patient caused difficulty in applying the magnet, and would have rendered anesthesia necessary for X-ray examination. Dr. Patterson was ill for a week, after which the iris was found to have a suspicious rusty tint. On January

7th, fifteen days after the injury, use of the magnet under ether brought a foreign body into the anterior chamber, but not out of the eye. Even after incision as for cataract was made in the cornea, the foreign body came away only on inserting a pair of scissors into the anterior chamber, and bringing the magnet into contact with the scissors. A long string of pigmented tissue came away with the foreign body. An equally large piece of tissue remained in the corneal wound and was cut away with the scissors. The eye had remained quiet and most of the time without pain. The remains of the lens was opaque and occupied the anterior chamber. Tension was minus.

Discussion.—Dr. Coover felt sure that the eye would have to be enucleated.

Dr. Black favored cleaning out the lens substance at the time of removing the foreign body. This saved nature a lot of work and tended to shorten the period of inflammation.

Dr. Patterson thought that if he had attempted to remove more of the lens he would have lost vitreous and had a flat globe.

Noninflammatory Interstitial Keratitis.

Dr. J. A. Patterson presented a woman of 25 years, who had had in each eye an interstitial keratitis which had run an unusual course. She had been refracted in February, 1912, at which time she had merely symptoms of eye strain. In June there was an episcleritis in both eyes, with little photophobia or pain, and which under salicylates cleared up entirely in about six weeks. On September 27th she returned, complaining of diminished vision, which was found to be due to an interstitial keratitis starting from the corneal margins and presenting more or less circular areas of clouding. There was neither pain, photophobia, lacrimation, nor redness. The disturbance spread rapidly, but was partly arrested by mercurial inunctions. The teeth were noticed to be of the Hutchinson type, and a Wassermann test proved positive. The left eye had a small area of disturbance of choroidal pigment, not far from the macula. On November 29th a 0.9 gm. dose of neosalvarsan was given. During the course of the corneal disease she had complained of occasional spells of severe pain in the left side of the head, lasting two or three minutes. Right vision had at one time fallen as low as 6/22, but was now better. Recently

subconjunctival injections of citrate of soda had been used to favor osmosis and absorption.

Discussion.—Drs. Black and Aufmwasser recommended making subconjunctival injections of cyanid of mercury, preceded by acoin to lessen the pain.

Syphilitic Iritis.

Dr. A. C. Magruder presented a man of 25 years, who had recently had an attack of luetic iritis in each eye. During the last three years there had been a number of minor injuries to the eyes, the patient being engaged in railroad work. From September 13 to November 21, 1912, both eyes had been more or less red and painful, with intense photophobia. Wassermann test was positive, and combined treatment with potassium iodid and mercurial inunctions was instituted. In the left eye a sort of pannus extended over the cornea above and below, and there were old corneal scars. There was a peculiar wrinkled appearance in either the anterior capsule or cornea of the right eye.

Discussion.—Dr. Coover and others thought that the wrinkling was in the cornea.

Dr. Coover thought the history of the case pointed to a corneal lesion.

Dr. Neeper stated that when he had seen the case two years back the cornea took a faint stain at various points.

Meeting of February 15, 1913. Dr. W. C. Bane presiding.

Chronic Iridocyclitis After Injury.

Dr. Melville Black presented a youth of 19 years, who in August, 1912, had been injured in the left eye by a piece of wire from a wire cable. The fragment, which was a half inch long, penetrated the lens, but one end still protruded from the cornea, and the injury to the eye was much increased by the movements of the lids. The foreign body was removed, and linear extraction of the opaque lens later performed by an oculist in Wyoming. The upper outer third of the iris had become covered by a vascular membrane, the anterior chamber was almost obliterated, and the eye was steadily going to the bad. It was a case of chronic iridocyclitis. Tension was

slightly subnormal. Was it advisable to wait on the chance that the eye might become quieter, or would it be well to attempt slitting or removal of part of the iris, perhaps combined with irrigation for removal of some blood that had collected and partly organized in the anterior chamber?

Discussion.—Dr. Jackson thought that even if the eye were in good condition for operation, there would be no prospect of getting as good vision in this eye as the other already had; and felt that the chronic irritation in the eye was a strong contra-indication to operative interference. Although the tension was not far from normal, the eye might be in the balance between softening and glaucoma, and operation was likely to turn the chances towards the latter condition. Sympathetic involvement was possible. Browning had reported seventeen cases of sympathetic involvement in which the eye had become quiet after use of salvarsan; and this treatment might be considered as regarded this eye, or a vaccine might be tried.

Dr. Sedwick suggested that the main advantage of operation was likely to be a better excuse for removing the eye.

Dr. Neeper would limit surgical intervention to a broad iridectomy.

Dr. Patterson supported Dr. Jackson's views, and would remove the eye if the systemic treatment proved unsuccessful, because of danger to the other eye.

Albino Benefited by Amber and Correcting Lenses.

Dr. G. F. Libby again presented to the society a case of albinism presented five years earlier. In accordance with suggestions then discussed, the child had been given amber glasses containing her high astigmatic correction. The result had been very satisfactory. Vision had improved from inability to see a chair distinctly to right 5/60 and left 5/45, and the patient had succeeded in keeping up with her class in school. She went into the open air and sunlight with comfort, and the mental and physical development were good. The child had been seen in 1910, when Dr. Jackson and the reporter had agreed that there was increase of pigment in the iris and ciliary region, at the macula, and possibly in the choroid. Her present correction was, right and left —2.25 sph. with +4.5 cyl. ax. 90°.

Discussion.—Dr. Black suggested the use for near work of a grab back, consisting of a disc with a small aperture.

Various other suggestions were made, for the use of a slit instead of a round aperture, for shielding the eyes from light entering laterally, and for a double slit, vertical and horizontal intersecting.

Coloboma of Iris and Choroid.

Dr. J. A. McCaw presented a boy of 8 years, who had bilateral coloboma of the iris. In the right eye there was a coloboma of the lens. The left lens was opaque from congenital cataract, but there was no reason to suppose that the conditions otherwise differed from the right eye, in which there was a large choroidal coloboma below. A wide lateral nystagmus made it difficult to decide as to the relation of the coloboma of the choroid to the optic disc. There were no deformities in other members of the family.

Discussion.—Dr. Jackson thought the coloboma of the choroid surrounded the disc.

Old Trachoma With Blepharospasm—Improvement After Operation on Nasal Septum.

Dr. W. H. Crisp presented a man of 40 years, who had been first seen in July, 1912, on account of extreme blepharospasm. The patient stated that his sight had been all right until seven years back, when the eyes became sensitive to light, congested and painful, and there was marked lacrimation. The trouble had at first been called keratitis; but later, by a Denver oculist, trachoma. Several operations had been done on the eyes, such as sand-papering, rolling, and canthotomy for the spasm. The patient came to the office, led by his daughter, and wearing black glasses with side shades. The lids were held tightly shut; and when instructed to open the eyes, even in a subdued light, the patient opened his mouth, and contracted every muscle of his face, but only succeeded in very slight separation of the eyelids. When the lids were forced apart, or the upper lid everted, a violent attack of sneezing followed. There were apparently characteristic trachoma scars inside the upper lids, some pannus and old corneal infiltrates, and ciliary congestion. On July 26th tarsal excision was kindly done on both upper lids by Dr. Casey Wood of Chicago, who was visiting Denver in connection with the Colorado summer course in ophthalmol-

ogy. The lids made a good recovery from the excision, but there was no marked change in the irritable condition of the eyes. Local applications of tannin in glycerin, ichthyol in almond oil, and powdered atropin were used. The attacks of sneezing continued. The patient's nose was externally badly deformed as the result of a fall from a mule in childhood, and there also seemed to be marked obstruction to nasal respiration. He was therefore sent to Dr. W. C. Bane, who found the septum much deflected, and on August 27th did a submucous operation for relief of this condition. The right eye was much whiter next day, but became redder again in a day or so. After removal of the nasal dressing, both eyes became clearer, the patient felt better, opened his eyes wider, and no longer sneezed when the lids were widely separated. Ten or eleven weeks after the first septum operation, the patient had an acute cold in the head; during which the eyes were much worse again. On November 26th Dr. Bane did a second operation on the septum. From a few days after this operation there was almost continuous improvement in the condition of the eyes. The patient now keeps his eyes well open, even in a rather strong light, his eyes are white, and he has gained fifteen pounds since July.

Dr. Bane described the nasal condition. The septum had been completely adherent to the left wall of the nose, so that at the first operation it had been impossible to work much beyond the adherent point. The inferior turbinal on the right side was hypertrophied, but much smaller than before operation. It was the most difficult septum case he had handled.

Discussion.—Dr. Jackson stated that there had been some temporary improvement after the operation on the lids, while Dr. Crisp was away on a vacation, but no lasting improvement had occurred until after the nose operation, when the change was very marked.

Dr. Sedwick cited a case of blinking of the lids which had persisted after refraction, but had stopped after use of an atomizer for the nose.

Dr. Patterson thought that the eye condition might be explained on the basis of venous obstruction in the nose.

Dr. Black doubted whether the nasal operation would have been followed by so much improvement if the lid operation had not been done.

Dr. Neeper referred to a statement by Weeks, that he had seen no case of improvement in trachoma after tarsal excision.

Dr. Matson referred to the case of a woman of 55 years, whose eye trouble had begun three years ago, and had included corneal ulcer, blepharophimosis from chemosis, symblepharon on the left side, and entropion, but no pannus. The insides of the upper lids showed very bad scarring, yet trachoma was denied.

Dr. Jackson suggested that Dr. Matson's case might be one of pemphigus.

Dr. Magruder thought that in Dr. Crisp's case the nose and eye conditions had interacted, and that neither would have cleared up without operation on both.

Sarcoma of Ciliary Body—Transillumination.

Dr. Bane presented a preliminary report on a probable case of sarcoma of the ciliary body. The growth had separated the root of the iris on the nasal side, and also appeared slightly on the surface of the sclera in the form of a pigmented area. Dr. Bane demonstrated on the enucleated globe the sharp indication of the presence of an intraocular mass by means of a pocket electric light, the lamp of which he had protected with a small hard rubber cuff for purposes of transillumination.

Steel Injury of Eyeball—Simple Sideroscope.

Dr. Bane showed an eyeball which had been enucleated after unsuccessful attempts at magnet removal of a piece of steel. A fragment from a drill which was being struck with a hammer passed upward and backward through the cornea, iris and lens. X-ray photographs had shown the presence of a rather large piece of steel in the back part of the eye. The eyeball had been bisected after freezing, and the piece of steel was found imbedded in the sclera at the back of the globe.

Dr. Bane also showed a simple sideroscope which he had made, and with which he had confirmed the presence of the steel in this eye before enucleation. It consisted of a large glass jar from a cork in the top of which was suspended, by an adjustable wire and a delicate silk thread, a horizontal magnetized steel knitting needle. One end of the needle projected through a hole in the side of the jar, to an extent suffi-

cient to allow of its approximation to the eye under examination. The action of the sideroscope was demonstrated on the eye containing the fragment of steel. The sideroscope was more reliable than the test with the magnet, since the absence of pain on applying the magnet was unreliable.

Dr. G. F. Libby made a further report on a case of steel injury presented to the society by Dr. Walker in December. The patient was a charity case in one of the hospitals, and so had fallen into Dr. Libby's hands. The eye had been removed after an unsuccessful attempt at removal of the piece of steel with the hand magnet and scissors, the points of the latter being inserted into the vitreous. On freezing and bisecting the eye, a tough mass of purulent exudate was found in the lower part of the vitreous, occupying about one-eighth of the whole vitreous body, and in intimate relation with the posterior capsule of the lens. The foreign body, a very small one, was found imbedded in the exudate. The point of special interest was the finding of the foreign body, low and anteriorly close to the ciliary body; whereas at an earlier date its position had been shown to be about the middle of the vitreous. This had been before the diagnostic application of the giant magnet.

Discussion.—Dr. Jackson, who had taken part in the attempt at magnet extraction in the last case, stated that the scissors had been used in the belief that the foreign body was in the vitreous. There was a small track from the back of the upper part of the lens down through the vitreous. The giant magnet attempt had probably brought the foreign body forward to the ciliary processes.

Dr. Crisp said that the case suggested the possible danger in the diagnostic use of the giant magnet.

Angiomatosis of the Retina—(Von Hippel's Disease).

Because of the interest attached to the discovery of a disease having certain sharp characteristics, but until recently unrecognized as a distinct condition, Dr. Jackson showed a number of illustrations from the literature of an angiomatosis of the retina, first recognized as an entity by von Hippel, and known in Germany by his name. The disease was essentially one affecting the retinal vessels; led to degeneration of the nerve elements, increase of supportive tissue, and retinal hemorrage; and its characteristic lesion, according to von Hippel, was a

rounded swelling in some part of the fundus, with one or more large arteries and veins running to it. The final outcome was glaucoma.

After hearing Dr. Jackson's description of these cases, Dr. Bane stepped aside and produced from his records a sketch, made in 1895, from one of his own patients, showing a general fundus appearance completely agreeing with the typical picture shown by the printed illustrations. Dr. Bane's patient, then 32 years old, had stated in 1895 that he found in 1891 that the vision of his left eye was defective. During 1892 and 1893 the vision of both eyes had been much worse than at the time of his visit. The left pupil had responded to accommodation, but apparently not to light. The left eye diverged 6 mm and its movements were unsteady. The visual field of the left was much contracted in the upper and inner quadrants. The discs appeared normal, and the pupillary action and visual field of the right were normal. Vision: Right eye = 6/15; left eye = 1/50. The right upper temporal vein and artery were both tortuous and three times the normal diameter. Up and out three and one-half disc diameters from the disc was a rounded tumor two disc diameters across, and having a sharp edge except at the upper outer side, where the edge was feathery. The mass was in intimate relation with the main upper temporal vessels. On a branch vessel to its upper outer side were two much smaller tumors. The artery, as it left the disc and for a disc diameter beyond, was narrow and intermittently beaded. The vein disappeared as it reached the disc. Some distance below and slightly to the outer side of the main tumor, were some fine whitish deposits. The left upper temporal artery and vein were irregularly enlarged. The artery became normal for one and one-half disc diameters after it had gone a disc diameter from the disc, and then became beaded and enlarged for some distance. The vein was constricted as it left the disc, then dilated to double normal caliber, and then gradually fell away to more normal caliber.

Metastatic Bilateral Iritis Following Mastoiditis and Pneumonia.

The following case was reported by Dr. J. A. Patterson: Following an epidemic cold, a previously healthy boy of 9 years had a rapid otitis media and mastoiditis with epidural abscess. The mastoid abscess was opened, and the next day right-sided

lobar pneumonia developed. Four days later, after improvement for twelve hours, there was a sharp rise of pulse, temperature, and respiration, and the boy became delirious. Death occurred two days later. Eye symptoms had been noted by the nurse three days before death. When Dr. Patterson saw the boy, an hour before death, there was bilateral iritis with much exudate, which completely filled the pupillary area and cut off all fundus reflex. The mastoid pus was reported to show pneumococcus. A local autopsy of the mastoid region disclosed a clot one inch long in the lateral sinus and attached to its wall. As regards the eyes, the case was probably one of pneumococcic metastasis.

Discussion.—Drs. Black and Jackson thought the case likely one of metastatic ophthalmia. Such cases were not rarely bilateral.

Dr. Bane did not think operating on the mastoid within twenty-four or forty-eight hours was commonly good practice. Opening up the tissues before nature had had time to wall off the invasion was to open up the way to more general infection.

As illustrating the complications of opening up diseased bone, Dr. Bane instanced a case in which a good deal of disturbance of the nose and lids had followed operation for ocular proptosis with frontal sinusitis.

Anomalous Appearance at the Macula.

Dr. W. A. Sedwick presented a young man in whose left eye the center of the macula was occupied by an oval white area, its longer, horizontal diameter being rather greater, and its shorter, vertical diameter rather less, than one-fourth the diameter of the disc. The area was redder towards its periphery than in the center, and was surrounded by a slight pigment line, beyond which was seen the normal macular deepening of the regular fundus tint. There was another much smaller spot below and to the temporal side of the disc, and an even smaller one some distance up and out from the macula. The patient's visual acuity was normal in each eye.

Discussion.—Dr. Jackson thought he could make out some delicate choroidal vessels through the center of the spot.

Dr. Libby had recently seen a fundus which had two foveas.

Choroidal Sarcoma.

Dr. Edward Jackson showed a gross specimen, and also microscopic sections, from an eye which had been enucleated on account of the presence of an intraocular tumor. The patient, a man of 57 years, had come on account of failing vision. The tension of the affected eye was then 58 mm. of mercury with the Gradle-Schiötz tonometer. No definite fundus reflex was obtained. The retina was noted as probably detached. Transillumination was good except in the upper nasal quadrant of the globe, from about 90° to 150°. By ophthalmoscopy with direct sunlight a yellowish mass was indistinctly visible in the upper nasal quadrant. The patient had been operated upon for fibroid tumor of the testicle about fourteen years earlier. After this examination the patient was next heard from through a general physician in western Colorado, to whom he had gone to have the eye enucleated. The globe contained, in the region of poor transillumination, a large roundish mass, which on microscopic examination proved to be a sarcoma composed of small spindle cells and irregularly pigmented, some parts being entirely free from pigment. A peculiarity of the growth (hematoxylineosin stain) was a dense massing of heavily staining cells in thin strata, which, alternated with the lighter staining cells, produced almost a tubular appearance in transverse section.

Discussion.—Dr. Patterson wanted to know whether the sunlight ophthalmoscopy showed more than was to be seen with the electric ophthalmoscope.

Dr. Jackson answered that sunlight ophthalmoscopy was the only method which showed up the mass in this eye. If sunlight were used in such cases, it must be either with a plane mirror, or with the light out of focus on the patient's eye, because of the risk of excessive heat.

William H. Crisp,
Secretary.

OPHTHALMIC SECTION,

ST. LOUIS MEDICAL SOCIETY.

Meeting of January 8, 1913.

Report of cases by Dr. Clarence Loeb:

(A) Beginning Concussion Cataract.

C. B., male, a carpenter, while hammering a nail on January 3, 1913, was struck in his left eye. He is positive that it was the entire nail and not a piece of it or of the hammer which struck him. He was not rendered unconscious by the blow, but could not see with the eye afterwards, although his vision had been good previously. I saw the patient for the first time on January 6th, at which time there was circumcorneal injection, an incised wound of the cornea, and a contracted pupil with some pain. After the pupil had been dilated it was possible to see the lens. The anterior capsule was intact, but the lens substance showed a number of opacities, arranged in a circle, very similar to those of a beginning senile cataract, but not so far peripherally. They have become larger in the few days he has been under my observation. I have not been able to obtain a view of the fundus, but do not believe there is a foreign body in the eye. I present the case because of the pretty picture it affords of a beginning concussion cataract.

(B) Case of Probable Retinitis Luetica.

The second patient, Mrs. E. S., age 54, whose vision has been steadily decreasing for two months, without any pain or other symptoms. The left eye was especially involved. I saw her first on December 12, 1912. Vision, right eye, 1/15, increased to 1/8 by addition of + 1.5 S. Vision, left eye, less than 1/30; no improvement by glasses. Fundus examination under homatropin: Right eye shows a dark area in the macula, but no actual retinitis. However, above the macula and rather toward the disc is an arc of six to eight white dots, which are evidently the product of a retinitis. No hemor-

rhage. In the macula of the left eye is a large, oval, white plaque with a small amount of pigment above and below. Examination of the urine showed no albumin nor sugar, which examination was repeated today with the same result. No luetic history could be obtained, and the Wassermann was negative. However, under the administration of k. i. the vision was increased to: Right eye, 6/20, with + 1.5 S. was 6/15 nearly; left eye, 1/20, with + 1.5 S. was 1/20 +. The exact diagnosis is in doubt, except for the diagnosis ex juvantibus of retinitis luetica.

Discussion.—Dr. Jacobs referred to a paper appearing in the *Klin. Woch.*, on "Retinochoroiditis," by Jensen, in which the literature was reviewed, seventeen cases reported, and a somewhat similar lesion described. No definite etiologic facts were presented, but the tendency to recurrence was especially noted.

Dr. Green: Although this case does not have the clinical appearance of tuberculosis of the retina, I would suggest the diagnostic injection of tuberculin.

Dr. Loeb, in closing: This case was in a way similar to the one I presented about two months ago. A case which had the same character of white dots in the retinæ, but much more pronounced than in this case. They formed almost a complete circle around the macula, which was unaffected.

Equivalent Values in Spectacle Lenses.

Dr. W. E. Shahan: Practically all the textbooks on ophthalmology treat the subject of lenses and the properties of lenses in quite a superficial manner. All distances are measured from the center of the lenses, and all lenses are considered without thickness. Moreover, lens grinders and spectacle salesmen compute the powers of lenses in simple arithmetical way. A lens with a plus 20 D. surface on one side and a minus 10 D. surface on the other is a plus 10 D. lens, and such a lens will be practically neutralized by a minus 10 D. lens held against its convex surface. But if such a lens is prescribed for a patient whose hypermetropic or aphakial defect is accurately measured by a plus 10 D. double convex lens, it will be found that the defect is overcorrected by about two diopters. This plus 10 D. meniscus lens has, therefore, an equivalent value of 12 diopters (for Bausch & Lomb glass where the re-

fractive index of the Fraunhofer ray D. is 1.5225, and ground with Bausch & Lomb tools, and the greatest diameter of the lens is 40 mm.).

The simple rules which hold well enough for double convex and double concave lenses fail. This was shown to be due to two prominent factors: advancement of the second Gaussian point along the axis of the lens in a direction away from the concave surface in collective lenses, and to absolute increase in power (of collective lenses) with increasing change in form. This was illustrated by diagrams and formulæ. And the "equivalent value" of double convex lens in terms of a meniscus lens was defined as that double convex lens which, when put into the same rim as that which held the meniscus lens, brings parallel rays to a focus at the same distance from the plane of the rim as the meniscus does. It was shown that all equivalent values could be accurately computed and charted so that when the usual defect is accurately measured with double convex or planoconvex lenses, the value of any corresponding meniscus can be read off without the labor of tedious computation. A method of computing the thickness of any double convex or meniscus lens when the diameter and radii of curvature of the two surfaces are known was also explained in detail.

It will be realized at once, from the above statements, that when the visual defects are measured accurately with double convex or planoconvex lenses, and the glasses are ordered in meniscus or toric form, the result will be an overcorrection which will be too great to be in stronger lenses. It is to render available for immediate practical use the advantages of diminished astigmatism of oblique pencils and flatter fields that graphs of equivalent values in spectacle lenses are being prepared. The intention is to prepare these for Bausch & Lomb glasses where N. D. = 1.5225 and for American Optical Company glass where N. D. = 1.507, and arrange formulæ for making the same calculations for any other variety of glass of which N. D. is known.

It was also shown that meniscus lenses, equivalent to double convex lenses, have telescopic properties which are lacking in the double convex lenses in the ordinary position. It thus happens that visual acuity measured accurately with double convex lenses is somewhat greater with the correspond-

ing equivalent meniscus or toric lenses, because of telescopic magnification. Emphasis was laid upon the fact that the ordinary neutralization test fails to discover these discrepancies in equivalent values.

Discussion.—Dr. C. Barck: This paper by Dr. Shahan interested me very much, and I want to congratulate him; more especially so, because mathematical subjects are rarely brought before this section.

His calculation of the thickness of a lens from the two known quantities, namely, the radius of curvature and the diameter of the lens, is very clever, and in lenses of higher degrees their thickness is no negligible factor, as is well known.

In regard to the second part of his paper, I beg to differ somewhat. It seems to me that he approached the subject from an erroneous premise. When calculating the respective foci from the positive and from the negative surface of a meniscus, he measured from the base line (referring to the drawing) and proved that there was a difference. But if you can measure from the center of the meniscus, as measured in the case of the biconvex lens, or if you place the meniscus upon the base line, there will be no difference. In other words, the difference in focus is no inherent quality of a meniscus, but depends on its location. If I understood the tenor of Dr. Shahan's paper correctly, he seemd to assume the former.

Whilst dissenting in respect to his theoretic foundation, I fully agree with him as to this fact: that a meniscus, if placed before the eye, gives a different focus than a biconvex lens of the same respective value before the eye. (Example: a meniscus with a concave surface of 10 and a convex surface of 31 will have a different focus than a biconvex lens of 11.) But the reason for this difference lies in the position of the lens in reference to the eye; the center of the meniscus is more remote from it than the center of the convex lens. If you place the latter farther away from the eye, the position of the meniscus, the focus will accordingly recede; and if you want to retain the first focus with the lens in the second position, you will have to increase its strength. As we are hardly able to change this forward position of a meniscus, it is necessary to bear in mind that a simple mathematical calculation will not do, if we want to substitute a meniscus for a biconvex lens. We must add one to two diopters to the convex surface. Ex-

ample: Plus 10 is not equivalent to a meniscus of "minus 6 and plus 16," but to a meniscus of "minus 6 and plus 17 or 18." The amount of the necessary addition increases of course proportionately to the increase of the concave surface; if the latter is of small degree, it is a negligible factor; if of high degree, it is very important. The exact amount of the addition in a given case depends upon the nearer or farther position of the meniscus from the eye, and this again depends upon the frame, the configuration of the face, etc. For this reason it is difficult to estimate the exact addition when testing with the frames of our test cases.

This subject is certainly a timely one; for I believe that frequent mistakes are made with menisci, and furthermore, that we do not make use of them to the full extent of their utility. The only scientific communication which appeared in medical literature, so far as I know, is by Ostwalt. His first article appeared in 1898 and the second in 1900, in *Graefe's Archives*. Basing his investigations upon the distinctness of peripheral vision, he calculated the best concave surface of the equivalent meniscus for all concave and convex lenses from 1 to 20 diopters. For cataract lenses he found that the best concave surface is one of a minus 11. This would give for a plus 11 an equivalent meniscus of "minus 11 and plus 22" theoretically; and "minus 11 and plus 23 to 24" practically (after the necessary addition, as outlined above). I copied his table and have kept it since then near my test case for ready reference. But there is one difficulty encountered. The opticians are provided by the large houses, like Bausch & Lomb, with two forms of menisci only: the one with a concave surface of minus 1.25 and the other with a concave surface of minus 6.0. The price for these is moderate. All the other menisci must be ground by the optician, and the price is rather high, especially for cataract lenses.

"Meniscus" and "perioscopic" lens are synonyms. At present the latter term is more frequently used than the former one. Menisci were ground centuries ago by the Venetians, although their qualities were unknown. It was Wollaston, an English physicist, who discovered in 1803 that such lenses give a superior peripheral vision, and he introduced the term "periscopic" lenses for menisci and advocated their use. But his discovery fell into oblivion for a long time, and it is only

in the last twenty years that they have become practical. Ostwalt's essay seemed to prove their value.

Bausch & Lomb have recently published a chart showing a biconvex lens; then a lens with a concave surface of minus 1.25, which they call a periscopic lens; and finally a lens with a concave surface of minus 6.0 which they call a meniscus. They say that the trade uses these two words in order to distinguish readily the two kinds of menisci which are in the market.

W. H. Luedde,
Section Editor.

PHILADELPHIA POLYCLINIC OPHTHALMIC SOCIETY.

Meeting of January 9, 1913. Dr. Wendell Reber in the chair.

Removal of a Large Sarcoma from the Orbit with Preservation of the Globe.

Dr. William Campbell Posey showed a man from whom he had recently removed a large sarcoma from the orbit with preservation of the globe. Although it had been necessary to enlarge the incision proposed by Krönlein by a horizontal one which extended below the superciliary ridge and parallel to the supraorbital margin, to permit the removal of the growth, the deformity was exceedingly slight, the lines of incision being barely visible.

A Tansley-Hunt operation had been performed some months after the Krönlein procedure to relieve the ptosis occasioned by the loss in function in the levator consequent upon the division of the nerve supply. Full details of the clinical history and the pathologic report would be given later.

Dr. Reber called attention to the excellent motility of the globe and the splendid position of the eyeball, and stated that it was the most perfect result after a Krönlein operation that he had ever seen. One really had to hunt for the scar left by the temporomalar incision.

Violent Bilateral Anterior Uveitis.

Dr. Reber exhibited a case of a young colored woman, eighteen years of age, with a violent bilateral uveitis anterior, reducing vision to about 1/60 in each eye. She had lived to the flesh with all her might and main; result a strongly positive Wassermann reaction.

The left eye had shown a very small scleral staphyloma from 2 to 3 mm. in diameter, just back of the upper outer limbus, but it had subsided promptly on treatment. The right eye then began to develop tension, with great supraorbital pain and narrowing of the anterior chamber. This became so marked that a paracentesis was done, with consequent prompt reduction of

the tension, but after a few days a scleral staphyloma began to bulge forward at the lower limbus, and in spite of all medical treatment continued to increase in size until it was larger than the cornea itself. During all this time the tension remained about minus one and the patient was absolutely free from pain. The patient was seen in consultation with three or four colleagues, all of whom inclined to the diagnosis of gumma, and two of them were quite convinced that enucleation would become absolutely necessary. Neosalvarsan and mercurial inunctions had been used for about two weeks without any benefit. At this juncture the eye was thoroughly cocainized and three drops of absolute alcohol (95 per cent) were introduced directly into the substance of the ectasia by means of a hypodermic needle. Within five days the ectasia was hardly in evidence, and within ten days there was nothing to mark the site of the previous extensive staphyloma other than a broad pigmented line along the lower limbus. Dr. Reber speculated upon the possible conditions that existed within the ectasia, rejected the idea of gumma and thought it might have been a cystic condition.

Dr. Posey in discussing the question also rejected the idea of gumma, although he saw objections in the way of assuming that the condition was a cystic one.

The Use of Bifocal Glasses in the Orthoptic Treatment of Strabismus in Children.

Dr. Wendell Reber discussed the various theories for the genesis of convergent strabismus in little children, saying that he was convinced that the usual clinical picture was that of a weak or even entirely absent fusion sense complicated by a more or less unequal refractive error. With a weak fusion sense the accommodative apparatus of the eye easily falls into vicious habits. The correction of these vicious states of the accommodative apparatus have been made, up to the present time, by the use of practically full correction and the continuance of atropin in one or both eyes for one to three months after the glasses were put on. Two years ago he had come to the conclusion that it could do no harm to carry this idea to its logical sequence. He therefore not only ordered a full correction for infinity, but to this added plus 2 to 3 D., to be made up in an invisible bifocal glass, thus setting aside practically

all accommodative effort in the eyes of these little subjects, whose accommodation is so abnormally spastic. The combination of bifocal glasses and atropin in both eyes for two to three months is the most complete orthoptic method for the abolition of accommodative spasm with its associated overconvergence.

The first of such glasses ordered were made up in lenticular bifocals, but they excited so much comment when worn by a four-year-old child and subjected the parents to such unceasing questions from every interested person, that the glasses were made up in an invisible bifocal. Bifocal glasses have been tried in this way in eight cases of seemingly pure functional strabismus. That is to say, no congenital features present in any of the cases.

Dr. Reber has been much impressed by the excellent results achieved in these eight cases, and thinks they are superior to those secured by the methods at present in vogue. One objection is that the little patients at once try to dodge the bifocal and for the first week bob their heads about a good bit, but they soon learn to adjust themselves and the bifocal's good effect upon the deviation seems to follow soon after. He feels that the method is well worth a trial.

Discussion.—Dr. Posey expressed his appreciation of the value of Dr. Reber's suggestion, and said that, as Dr. Reber claimed, the removal of the accommodative effort by the superposition of additional spherical strength in the bifocal slips, was quite in line with the teachings of Donders and should tend to establish as far as was possible the normal relationship between accommodation and convergence which was necessary for straight visual axes. The only objection he had to offer was the difficulty there might be in adjusting the slips to the squinting eyes. Dr. Posey was averse to glassing children younger than three years of age, and decried the practice of some of tying the spectacles on the heads of infants with tapes, on account of the danger of the pressure exerted by the glasses upon the root of the nose, altering the formation of the lines of the face and interfering with the proper development of the orbit. He insisted upon the early differentiation of cases of congenital squint from those under discussion. He doubted if in cases of concomitant squint, vision sank as rapidly in the squinting eye as Worth has averred.

Dr. Zentmayer said that believing as he does in the correctness of the theory of Donder as to the cause of esotropia, he

considered Dr. Reber's method rational but not generally practicable in young children. Exactly the same thing has been recommended for esophoria, that is, to diminish the accommodative effort at near work by the addition to the distance glass of a plus 2 or 3 D. lens to be worn for near work.

Dr. Pfeiffer said he had little confidence in Worth's method. Experience had shown him that it required very intelligent parents to permit following out similar plans to Dr. Reber's on children. He thought that with a lower segment, no matter how it was shaped, there attained an effort on the child's part to look around the edge to escape the more powerful glass.

Dr. Reber, in closing: There is no question, as I pointed out in my opening remarks, but that these little patients have difficulty the first week or ten days in getting used to the bifocal glass. In no one of the cases has the discomfort extended beyond this time. The influence of the fusion faculty on the genesis of strabismus in little children cannot be lightly regarded. It is perfectly true, as Dr. Zentmayer says, that the use of a plus 2 to 3 over the infinity correction has been in vogue for some years. In the first edition of Hansell and Reber on the "Muscular Anomalies of the Eye" (1896), this method of the treatment of esophoria was gone into at some length, and during these seventeen years we have resorted to the method in a number of cases with gratifying results. Indeed it was the success of these cases which led us to apply the above mentioned method in strabismus of little children. If the object of the orthoptic treatment of strabismus is to break up the vicious accommodative habits into which the visual apparatus has fallen, we believe this will prove to be a contribution to the orthoptic treatment of squint.

The Treatment of Dendriform Ulcer of the Cornea.

Dr. William Campbell Posey spoke of the various types of superficial inflammation of the cornea which were associated with dendriform opacities, and referred to the infrequency of dendriform ulcer in women. He had recently had under his care a number of young men with dendriform opacities, in whom a persistent conjunctivitis apparently played an important part. In the treatment he thought that at first all irritation should be avoided, cauterization of the cornea being resorted to only when the

opacity showed a tendency to spread and to resist milder measures. He preferred carbolic acid to other drugs, care being taken to limit the application of the crude acid to the part affected.

Subsequent applications of an ointment containing atropin, iodoform and vaselin relieved pain and promoted healing. He had found holocain of little value in the treatment of this affection.

Discussion.—Dr. Zentmayer said there is a wider acceptance of the view that dendritic ulcer, herpes cornealis, superficial punctate keratitis and allied superficial forms of keratitis are of neuropathic origin than formerly, but he did not consider the evidence sufficient to include all within this etiology. As to the treatment, his attention was called to the value of holocain in these conditions some years ago by de Schweinitz's memorandum of the value of this drug in relapsing erosions of the cornea, and he has since used it in all corneal conditions and he thinks with decided advantage, combining a compress bandage in some forms. Finding that oil of turpentine, next to the solid stick of nitrate of silver, was the most efficient treatment for aphthous stomatitis, he was led to use it in corneal ulcers, and it seems to be of special value in dendriform ulcers. He recalled that in a very pronounced case of filamentous keratitis which had resisted all forms of treatment, he had, at the suggestion of Dr. Posey, employed a strong yellow oxid ointment with benefit.

Dr. Sweet advocated the use of holocain and drew particular attention to the way in which holocain solutions seemed to vary, not only in their anesthetic properties, but in their irritative properties. In his hands some solutions had seemed to be so much more irritating than the average solution, that he was led to speculate on whether the chemical itself always came into the market in the same condition.

Dr. Reber also endorsed holocain, and was not persuaded that malaria occupied the prominent place in the etiology of this disorder that was once ascribed to it. Anything which induced a neurotrophic state might well be the cause of the dendriform ulcer of the cornea. In this sense a neighboring dental or nasal disorder might easily prove to be the existing factor.

W. Walter Wilson,
Secretary.

Meeting of February 13, 1913. Dr. Wendell Reber in the chair.

Complications During and After Cataract Extraction.

Dr. William Campbell Posey said that many of the complications which arise may be avoided by the development of skill in operating, acquired by practicing upon the eyes of the lower animals, before essaying the extraction of the lens from the human eye. Great care should be exercised in selecting proper instruments. A badly constructed speculum is responsible for many accidents. He preferred the Murdock. The cystotome must be sharp, and dislocation of the lens during extraction and subsequent loss of vitreous may often be avoided by a skilful handling of this small but important instrument. He warned against dipping the point of the knife too deep into the angle of the anterior chamber at the point of counter puncture. A well placed conjunctival flap hastens healing and prevents later complications. Loss of vitreous often occurs from gaping of the wound, in consequence of the patient's being directed to look down too far. A skilful and experienced operator will have loss of vitreous in but few cases. He deprecated the performance of the Smith operation, on account of the loss of vitreous which it so often entails. He prefers the simplest manner of extracting with iridectomy. While most cases of infection arise from external sources, from germs in the conjunctiva, or from unclean instruments or drops, endogenous causes operate at times, especially in gouty and diabetic cases. An active internal medication, directed toward the sublying systemic cause, must always be joined with the local treatment in all such cases. Rise in tension is due either to a change in the nature of the intraocular fluids or to obstruction of the angle of the interior chamber by iris, lens capsule or other mechanical cause. Division of the obstructing band can often be accomplished by a sharp knife needle. The blood which may fill the anterior chamber consequent upon iridectomy is seldom of consequence, but the massive hemorrhages which at times occur and are dependent upon ruptures and varicosities in the choroidal veins, usually demand enucleation. With the first symptoms of that most dreaded of all complications, panophthalmitis, the lips of the wound should be cauterized and hot compresses applied. Mental disturbances arise on the second or third day after operation in nearly 10 per

cent of all cataract cases. The cause is largely psychic, dependent primarily upon impoverished brain cells, in consequence of sclerotic vascular changes. Normal cerebration returns in a week or more, insanity arising only in cases which had manifested mental changes prior to operation.

Unusual Procedures in Cataract Operations.

Dr. William Zentmayer: Preliminary iridectomy may be performed, either as a preparatory operation for the extraction of a ripe senile cataract or an immature cataract either in a young individual or in the aged. In the first class of cases it is comparatively rarely done, in the second it is usually associated with some procedure calculated to induce maturation of the cataract, and in the last class it may be done to avoid the greater danger of dense secondary cataract when the combined operation is done. In this class the preliminary operation is not frequently done, as experience has shown that there is little cortical remaining at this time of life.

Ripening operations may be done with or without iridectomy. In the earliest, Foerster's, an iridectomy was combined with massage of the lens through the cornea; later, Bettman, White and others did direct trituration by the introduction of a spatula into the anterior chamber, with which the lens capsule was stroked.

About ten years ago, Tynen of Texas, who was performing capsulotomy as the first step in cataract operations, stated that he thought that at the extraction of immature cataracts the lens escaped more readily. Some years later Homer Smith advocated preparatory capsulotomy for the purpose of ripening the cataract. His operation consists in making a crucial incision in the anterior capsule with a specially devised miniature scalpel, and twenty-four hours later delivering the lens. Later, Fridenberg modified the operation by two peripheral parallel incisions so that a capsulectomy could be done at the time of the extraction of the lens.

For the extraction of immature cataracts the Smith Indian operation is applicable. (Operation described.)

The use of corneal sutures to aid in early union of the lips of the wound was discussed. They were considered of value in cases where loss of vitreous was anticipated. The sutures should then be inserted before the section is made, the suture

being of sufficient length that the loops may be drawn aside while the section is being made.

The advantages of having a complete conjunctival flap has led to the adoption of the usual procedure of injecting a few drops of some sterile solution in the conjunctiva, in the position of the counter puncture, so that the point of the knife can be carried the required distance under that membrane after emerging from the corneal tissue. In making the puncture the point of the knife is entered under the conjunctiva before penetrating the corneal tissue. If the knife is brought out subconjunctivally on finishing the section, a complete conjunctival flap will have been secured. The recent Belgian method is ingenious and had but one objection, the danger of infection by the presence of two sutures. In operation the conjunctiva is freed from the upper limbus over the area included in the corneal incision and undermined for some distance. A suture is inserted at either end of the conjunctival flap and brought out on the bulbar conjunctiva at the limbus, a short distance below the point where corneal incision starts; by tying the two ends of each suture the conjunctiva is drawn down over the cornea, completely covering the corneal incision. Couching of the lens might be necessary to give sight to an insane person with cataract, or it might be called for in the presence of a virulent conjunctival secretion which had proved rebellious to treatment, or in the presence of a dacryocystitis, if circumstances existed precluding extirpation of the sac.

Operations for After-Cataract.

Dr. Wendell Reber: The conditions which present "after-cataract" vary according as the healing of the eye has been complicated or uneventful. The simplest condition with which you will have to deal is an eye which has healed easily. Ophthalmoscopically with a plus 7 to plus 12, small opacities in the posterior capsule will be seen. For such conditions a T or crucial incision is done.

Another cause of "after-cataract" is a proliferation from the remaining lenticular cells. It will give rise to a denser mass to deal with. If there is lenticular matter to deal with it may become massed on the anterior capsule. These three conditions, however, are reasonably easy to cope with. When iritis or cyclitis follows an operation, it is a different story; it almost

surely compels some manner of secondary operation. About 40 per cent of operated cataracts present some degree of postoperative iritis. I do not speak of transient conditions, I mean the condition that begins to develop about the sixth day after operation. This in spite of a very careful extraction and the most careful treatment of the case afterward.

When the eye has quieted down completely after an iridocyclitis and has so remained for two to three months, instead of a simple incision, it will be necessary to do an iridotomy. This may be done with de Wecker's scissors, or with Ziegler's iridotomy knife. With this instrument one can sometimes secure a very satisfactory pupil even though its edges be irregular. It is a difficult operation to do. If the knife is introduced too far back, one doesn't get as good a fulcrum as if the entry point is 2 mm. in front of the limbus. The least traction exerted on the iris and ciliary body the better. No bandage should be applied, but atropin and argyrol (20 per cent) instilled at once, ice compresses applied to the eye and a course of calomel administered internally. This will usually prevent recurrence of the postoperative inflammation.

All iridotomies and capsulotomies or capsulectomies should be done under artificial light with strongly condensed illumination. Careful study of the field of operation (before operating) under condensed light is imperative, if success is to follow.

The users of capsule forceps (capsulectomy) agree that they render unnecessary a secondary operation on the capsule. Recent reports would lend much probability to this claim. This point is not yet absolutely proven, however.

Discussion.—Dr. Zentmayer said that in cases of dense inflammatory membranes he would try the Ziegler operation, and if this failed he would do the operation devised, he thought, by Kuhnt. A narrow Graefe knife is entered at the lower third of the cornea 1 mm. inside the limbus, the point is thrust through the iritic membrane at once, the blade is then carried parallel to and behind the iritic membrane until a point about 1 mm. from the opposite limbus is reached; it is there brought out through the cornea and a downward incision through membrane and cornea is completed. The iris incision usually springs open, giving a large opening; should it not have sufficient resiliency for this to result it may be grasped with forceps and brought out through the wound and there snipped off.

Dr. Reber: The suggestion encountered in many text books that "prolapsed vitreous should be cut away with scissors and the toilet of the wound then completed" has always interested and amused me greatly. Most frequently the vitreous is semifluid and shows a disposition to flow all over the field of operation. To attempt to abscise such vitreous is to my mind a fearful waste of precious time. The average operator in the presence of vitreous loss is only too anxious to get the speculum out as quickly as possible and allow the eye to close. Usually the patient realizes that something has gone wrong and becomes unruly. After the eye has been held closed a few moments they may regain their composure. Then if the lids are very carefully opened and the corneal conformer I have described is introduced the situation is entirely under control. The iris may be returned and if so desired a corneal suture introduced. I have done this three times. There is nothing I know of that will afford the feeling of security thus gained. I am distinctly of the opinion that some day this will become an accepted procedure in ophthalmic surgery. Vitreous loss is admittedly the most formidable complication of the cataract operation, and anything that promises prevention or control of this calamity demands our most careful consideration.

D. Forest Harbridge,
Secretary.

WILLS HOSPITAL OPHTHALMIC SOCIETY.

Meeting of December 2, 1912. Dr. S. Lewis Ziegler, Chairman.

Dermoid at the Corneoscleral Margin.

Dr. Burton Chance reported two cases of dermoids at the corneoscleral margin which had been under Dr. Schwenk's and his own care in the present year. The tumors exhibited their well-known characteristics, and in Dr. Chance's case the mass increased in size in the past few months. The tissues in each case contained hair within well-formed follicles, and in Dr. Chance's there were sweat glands and marked pigment proliferation, while the squamous epithelium covering showed evidences of horny condensation.

Recurrent Sarcoma of the Orbit.

Dr. Zentmayer exhibited a woman of 74 years who had been operated for sarcoma of the orbit by the late Dr. Norris in 1897. The growth originated in the lacrimal gland and was found to be encapsulated. There was a recurrence in 1905, at the time she came under Dr. Zentmayer's care. There was at that time a large hemispheric mass occupying the outer, upper region of orbit. The growth was enucleated and found to be partly encapsulated. After the wound had healed she was given ten X-ray treatments. One year later the tumor began to grow again, and in 1910 extended from the zygoma to the hairy scalp and almost the whole length of the supra-orbital margin. The mass removed, the globe enucleated and the orbit eviscerated. The growth had invaded the frontal sinus on the other side. The clinical diagnosis was cylindroma. The pathologic report by Dr. Goldberg was that the tumor was a small round cell sarcoma, nonpigmented but very vascular. The eyeball was unaffected, as were also the deeper orbital tissues. The superficial orbital tissues, the skin of the face and eyelids, were extensively infiltrated with the growth.

The patient returned October 7, 1912, showing little evidence of recurrence until the first of the year, but since then it had been very rapid. The mass was of about the same dimension

as in 1910. There was also a growth (probably epithelioma) below the inferior orbital margin. At the operation the sarcoma was found to extend into the calvarium. The epithelioma was removed and the wound covered by a Diffenbach sliding flap. The other wound was allowed to granulate. Marked physical and mental impairment have followed the operation.

Dr. Ziegler spoke of a case of recurrent sarcoma which had involved the ethmoid region, in which he had used Ewing's solution, followed later by applications of formalin 1 per cent, which entirely cleared up the sarcomatous mass with no recurrence for a year, when she was lost sight of.

Optic Atrophy Following a Blow Over the Orbit.

Dr. Charles G. Reed exhibited a patient with monocular optic atrophy, who on October 11, 1912, had received a severe blow on the upper orbital margin of the left eye from the elbow of another man. Immediately following the injury he suffered ocular pain and some nausea for hours. On the following morning he had but little pain, but was entirely blind in the injured eye. The examination on October 21, at the Wills Hospital, showed the left eye to be blind and the pupil inactive to light, but aside from this and a slight subconjunctival ecchymosis the examination was negative, the fundus being healthy in all respects. On November 29th the optic disc showed decided atrophy with cupping. Dr. Reed regarded the case as one of probable rupture of the optic nerve by fracture into the optic canal.

Discussion.—Dr. Posey referred to a case of complete monocular blindness following an injury to the head and attended by full restoration of vision which he had presented before the College of Physicians of Philadelphia in 1899. The subject of the blindness had received a hard blow over the left eye by the occiput of his child's head. Vision was unaffected until thirty hours later, when a veil seemed to drop before his eye. By the fifth day total blindness supervened. There were no external signs, though the nerve head was somewhat pale. Leeches were applied to the left temple, salines freely administered and a dram of mercurial ointment applied twice daily. After three days vision began to clear, and in twenty days was completely restored.

Dr. Posey thought that the comparative lateness after the

injury with which the visual disturbance manifested itself, indicated that the lesion must have been external to the nerve, for if the hemorrhage which caused the blindness resulted from a rupture of one or more of the vessels of the sheath of the nerve, it is probable that the nerve would have been affected at once by the outpouring of the blood and vision would have been lowered almost immediately. He referred to the literature of cases due to hemorrhage in the subdural space, and called attention to the details of diagnosis and prognosis.

Dr. Ziegler said that many years ago he had seen in the service of the late Doctors Harlan and Goodman, many cases of monocular optic atrophy due to saber wounds of the temple, which produced fractures of the orbit.

Ptosis.

Dr. S. Lewis Ziegler exhibited a case of monocular ptosis in which he had performed the Dransart operation. This consists in attaching the upper margin of the tarsal cartilage to the occipitofrontalis muscle by means of sutures. The result of the operation in his case was very satisfactory.

Embolism of the Central Artery of the Retina.

Dr. W. W. Watson reported a case which came to Dr. Posey's clinic at the Howard Hospital complaining of the sensation of a foreign body in his right eye, which had come on suddenly the previous evening. The same evening the patient noticed a marked diminution in vision in the affected eye, together with an increase of pain when exposed to artificial light. Vision at that time was reduced to fingers at four inches, although this was slightly improved by turning the head to the right. At the time of his visit to the dispensary the following afternoon the patient could distinguish only light and shade.

Externally the eye was negative, save for a dilated pupil caused by the installation of a mydriatic by his family physician. The ophthalmoscope revealed a distinct pallor of the disc and of the retina for about one disc diameter from the disc. The macular region was pale, the macula itself showing as a cherry-red spot. The arteries were collapsed and the veins full. No peripheral changes. Two days later the disc margins became very blurred and the pallor of the retina increased

in extent. At this time the eye was totally blind. The family history was negative, as was the personal history, with the exception of an attack of gonorrhea twelve years previously. Cardiac examination showed a myocarditis and a systolic blood pressure of 160 mm. Hg.

Dr. Zentmayer said that some years ago, in reporting a case of embolism of a cilioretinal vessel in a boy who had lost one eye from gonorrheal ophthalmia, and who had later suffered from gonorrheal synovitis and endocarditis, he had held that ophthalmoscopically the opacity in the retina in obstruction to the central artery did not seem to be in the nature of an edema, as it is so accurately limited to the area supplied by the obstructed vessels. This is also to be noted where there is a branch embolus. Where there is obstruction to the central artery in the presence of a cilioretinal vessel, the part supplied by this vessel, although right in the midst of the opacity, retains its normal transparency. In looking the question up he found that Frost had concluded that the opacity was due to a molecular death of the retina. Some years later Hancock took the same view, believing it to be an original thought. In Collins and Mayo's book the possibility of this view being correct is entertained.

Dr. Posey spoke of the differential diagnosis between embolism of the central artery of the retina and thrombus of the same vessel and drew attention to the repeated attacks of blindness which usually occurred in the latter affection. While no doubt cases of embolism do occur, thrombosis is far more frequent. He cited a number of cases which had been preceded by transient attacks of blindness in the affected eye which he had reported before the College of Physicians of Philadelphia in 1902, in some of which the loss of sight had been due to spasm of the arterial walls. In this connection Dr. Posey recalled a case of Dr. Leber's, where there were all the ophthalmoscopic signs of embolus, in which the microscope failed later to reveal any evidence of either embolism or thrombosis, Leber attributing the blindness and the pathologic findings to long continued spasm pure and simple. Dr. Posey said that the prognosis in all cases of transient blindness should be most guarded. It is impossible to predict what the outcome of any one of them may be, whether the blindness be due to spasm and be transient, whether it be due to a forming embolism which finally destroys the sight by shutting off the blood supply entirely, or whether

the same fatal result is attained as in the case reported by Leber, by long continued spasm, without microscopic change in the vessel walls. It has long been a recognized fact that iridectomy, by causing a dilatation of the blood vessels, reduced intraocular pressure. This operation has accordingly been performed in a number of cases of transient monocular blindness, with a view to preventing subsequent permanent blindness. Wagenmann would have it performed in every case of this nature. In view of the uncertainty regarding the cause and the course of these cases, it does not seem proper to Dr. Posey to subject an eye which may remain permanently healthy to an operation which in a certain proportion of instances, no matter how skillfully performed, renders the eye useless for visual purposes. He would, however, insist upon a treatment and a regimen to combat arteriosclerosis. At the time of the attack the value of nitrate of amyl has been proven and gentle but active massage of the eye should always be essayed.

Meeting of January 7, 1913. Dr. William Zentmayer, Chairman.

Sympathetic Optic Neuritis.

Dr. S. D. Risley presented a boy, aged seven years, who had received a blow from a fragment of wood on the left eye. He was seen on October 8, 1912, because of failing vision in the injured eye, when the lens was found swollen and gray. There was some tenderness of the ball to palpation and slight ciliary injection. The right eye was healthy.

With the use of atropin locally the injection of the ball rapidly subsided, but the lens became opaque throughout. On October 9th a discission was made and later soft lens substance evacuated. The operation was smooth and without unusual incident. A week later there were adhesions between the pupillary rim of the iris and the lens capsule, and the anterior chamber was deep, the iris being apparently drawn back by the synechiæ.

In December the boy complained of seeing badly with the right eye, which was at first thought to be due to the refractive error (plus 2.50 cyl. ax. 80 degrees), but after careful correction vision was found reduced to 6/30 and the field of vision concentrically contracted to approximately thirty degrees at its widest part. The optic nerve was a gray red, slightly swel-

len, and its margins veiled. There were no demonstrable macular changes, and if scotoma were present, they were not recognized by the boy of seven years.

On December 20th a Muhle's operation was performed on the injured eye, care being exercised to remove every vestige of the uvea, and a snugly fitting glass ball inserted. Convalescence was rapid and uneventful. The field of vision had markedly increased on January 2nd and was a typical normal field on January 7, 1913, and central vision with the correcting glass was 6/9.

The optic neuritis had entirely disappeared, the fundus and nerve presenting the appearance of health. Dr. Risley presented the case as one of transferred or sympathetic optic neuritis, which had in his experience been very rare.

Discussion.—Dr. Zentmayer had seen two cases of sympathetic neuritis, one following a gunshot wound of the fellow eye. Here there was a very pronounced neuritis and the case ran a protracted course, but the result had been very good. In the second case there had been an extensive cut of the cornea with traumatic cataract. The neuritis was of a moderate degree, but it ran a long course and terminated in full recovery. He though Dr. Risley's patient was fortunate in the very rapid subsidence of the inflammation. It will be recalled that Dr. Thomas of New York reported two cases and reviewed the literature of this disease at the last meeting of the American Medical Association. This analysis showed that the prognosis of this type of sympathetic inflammation was much more benign than where the uveal tract was involved.

Saemisch Incision.

Dr. P. X. K. Schwenk reported the following case in which he had performed the Saemisch incision. The patient, a stonemason, aged thirty-three years, came to the Wills Hospital on November 21, 1912. About seven days previous to his visit to the clinic he was struck in the right eye by a flying piece of stone. An examination revealed an ulcer of the cornea with a large, partially organized hypopyon. The pupil was partially dilated. In spite of cauterization with carbolic acid the eye became gradually worse. On November 24th Dr. Schwenk did a Schwenk-Saemisch incision, with the result that on December 21st the patient was discharged, cured.

Intrauterine Uveitis.

Dr. William Campbell Posey showed a baby with congenital pseudoglioma in the right eye and coloboma of the iris with ophthalmoscopic signs of an old choroiditis with secondary atrophy of the optic nerve in the left eye. The conditions were present at birth, the eyes being free from signs of inflammation at that time. Dr. Posey attributed the condition to an inflammation of the mesoblastic tissues concerned in the formation of the embryonal eye, in consequence of syphilis in the mother. The condition of pseudoglioma which existed in the right eye was, in his experience, unique.

The Complement Test and the Use of Salvarsan in Ophthalmology.

Dr. John L. Laird addressed the society by invitation and called attention to the slight unreliability of the complement test as generally performed and the consequent use of only personal observations as a basis for the statistic report and estimation of value.

As syphilitic affections of the eye are merely manifestations of general syphilis, the value of the test in the diagnosis, therapeusis and prognosis of these conditions is the same as in general syphilis. A positive reaction means syphilis, and a negative reaction, where the effects of treatment can be excluded, means no syphilis; the above conclusions being based on three years' work on 5,400 reactions on 3,000 cases. The possibility of the concomitant existence of general syphilis and pathologic conditions of a nonspecific nature is mentioned.

Brief statistics cover 149 cases of various ophthalmologic conditions, in known syphilities giving 96.2 per cent of positive reactions; in known nonsyphilities 100 per cent negative; and in suspected cases, 17.5 per cent positive. The danger of too highly estimating the diagnostic value of the therapeutic test in ophthalmology was spoken of and reasons stated.

Attention was called to the important point in the treatment of syphilitic conditions of the eye, that it should be that of general syphilis, usually of the virulent type, and should be governed by the course, as shown by the complement fixation test, and not by the local clinical manifestations. The therapeutic value of salvarsan and neosalvarsan is the same in syphilitic affections of the eye as in general syphilis. Most of

these conditions respond rapidly. Certain severe forms of interstitial keratitis, however, are obstinate and require several injections before improvement is observed; all of these cases in the author's experience, whether hereditary or acquired, have been not only improved but cured, if sufficient treatment was administered. There are no ophthalmologic contraindications to the use of salvarsan or neosalvarsan; and with general contraindications absent, the most important of which is nephritis, salvarsan or neosalvarsan is by far the most effective remedy at our command in the treatment of syphilitic ophthalmologic conditions.

Discussion.—Dr. Posey said that while salvarsan had rendered him undoubted service in the treatment of ocular affections due to acquired syphilis, his results from the use of this drug in interstitial keratitis due to inherited lues has been very discouraging, in some cases even aggravating the symptoms.

Dr. Zentmayer said that recently in going through the wards with a visitor and a colleague he had been asked: "Are the surgeons at Wills treating interstitial keratitis with salvarsan?" He replied that they were not, because no results had been obtained. His colleague said he was not, because at the present time he had under his care two cases of optic nerve disease resulting from salvarsan. It is to these two replies that he wished to direct his remarks. In explanation of his own reply he wished to say, however, that he had had exceptions. At the present time he has at the Polyclinic Hospital the most severe case of interstitial keratitis that he has ever seen. The cornea was infiltrated throughout, was soft and slightly staphylomatous, and the vascularity was of the "epaulette" type. There was a strongly positive Wassermann. Inunctions and k. i. failing to arrest the progress of the inflammation, it was decided to try salvarsan. After the first injection of .6 gramme of neosalvarsan there was no improvement noted, but after the second, given one week later, the improvement was remarkable. At present the congestion and vascularity have entirely disappeared and the exudate is undergoing absorption.

The cause of the unsatisfactory results heretofore reported is probably the failure to repeat the injection. As to the occurrence of neuritis after salvarsan, he believed that it is generally held that this is not due to the action of salvarsan upon the optic nerve, but that it is syphilitic in nature and due to the

increased activity of spirochetes so situated as not to come under action of the drug. If the salvarsan is repeated, it is said that the neuritis clears up.

Cerebrospinal Syphilis With Unusual Ocular Lesions.

Dr. Posey exhibited a man, the subject of cerebrospinal syphilis, with complete bilateral ophthalmoplegia interna, and involvement of most of the extraocular muscles of both eyes. Both optic nerves were the seat of a secondary atrophy. Dr. Posey exhibited the case particularly to show the effects of tenotomy of the inferior oblique muscle of the left eye, a secondary contraction of this muscle, in consequence of a paralysis of both elevators of the right eye, having occasioned marked postural changes in the muscles of the head and neck.

In speaking of the differential diagnosis between the ocular symptoms of tabes and cerebrospinal syphilis, Dr. Posey stated the observation of Groenauw that the Argyll-Robertson pupil is generally indicative of tabes, and unilateral ophthalmoplegia interna of syphilis. Syphilitic palsies, as a rule, affect the entire nerve or a greater number of its branches, while a single muscle is involved in tabes. Dr. Posey said it had been his experience that inequalities in the size of the pupil and disturbance in its reaction are found in the early stages of cerebrospinal syphilis often associated with optic neuritis, while palsies of the extraocular muscles, as a rule, belong to the later stage. When syphilitic palsies do occur in the early stages, they develop more gradually and persist longer, tabetic palsies manifesting a tendency towards speedy disappearance and frequent recurrence. Conjugate deviations and ophthalmoplegia externa are caused almost exclusively by syphilis.

Dr. Posey exhibited a series of pictures which illustrated the effect of tenotomy of the inferior oblique muscle in a series of cases where there had been an overaction of this muscle. He said the chief indication for the performance of the operation is the upward and inward tilting of the eye, which can be seen when the eyes are directed to the extreme right or left, when there is paresis of the right or left superior rectus muscle. The technic of the operation he said is simple; the tendon of the muscle being divided close to its origin at the lower inner angle of the orbit, by an incision which is made through the lid, somewhat lower, and more external, than that which is made

for the removal of the lacrimal sac. The insertion of a strabismus hook through the wound, and the upward movement of the eye following traction upon the tissues, indicates that the tendon of the muscle has been caught. The division of the tissues on the hook follows. Healing had been prompt in all cases operated upon by Dr. Posey, and there had never been any complications.

Discussion.—Dr. H. W. Rhein said that at Dr. Posey's request he had examined that patient at the Howard Hospital with the following results: There was no other cranial nerve involvement outside of the eye conditions which Dr. Posey has described, with the exception of a weakness of the facial muscles around the mouth on the left side. The sensation all over the body was intact. There was a distinct Romberg and the gait was ataxic. The knee jerks were absent and not reinforceible. There was a Babinski phenomenon on the right side. He has had for the last year, besides sharp shooting pains, incontinence of urine. The ataxia began two years ago. At first sight this case appears to be one of tabes. The permanent ocular palsies, dating four years before the onset of the ataxia, is unusual, however, in tabes the usual form of ocular palsy being of a transient character. It may be said, however, that while a complete ophthalmoplegia is unusual, it is in rare instances present in tabes. The incontinence of urine is another symptom which is present in tabes, but it is usually a late symptom. It will be remembered that in this case the incontinence of urine made its appearance one year after the onset of the ataxia, and has been persistent ever since. The presence of the Babinski phenomenon, incontinence of urine, and the persistent ocular palsies dating four years before the spinal symptoms, all pointed to a diagnosis of pseudotabes, which, as is known, is of syphilitic origin. The syphilitic infiltration of the meninges attacks the posterior roots and causes an ascending degeneration in the posterior columns. There is also an involvement of the other tracts of the cord from extension of thin infiltration, and of the cranial nerves at the base of the brain.

Tinted Glasses for Optical Purposes.

Dr. J. C. Attix addressed the society by invitation on the results of experiments he had performed to determine the effects of cutting out or rendering less irritating certain rays

of light. These experiments were begun in 1901 from observing cases of marked irritation and photophobia in workers who were engaged around blast furnaces where electric arcs of exceeding brilliancy were used for melting iron, from a similar method used for drilling armor plate, and from electricians operating switches where a short circuit was made and so-called flashes resulted. That ultraviolet rays are present in sunlight and artificial light also is no new knowledge.

The actinic rays are capable of performing certain chemical changes which other rays will not. There seems to be no division of opinion that these actinic or chemically active rays will produce the irritation that is often observed in those working under artificial light of great intensity, or in individuals whose eyes are particularly sensitive even to ordinary light. Dr. Attix found from experiments with different colored glass, using ordinary colorless, blue, red, green, amber, purple and violet, that violet is the most opaque to irritating rays, if as is believed the actinic rays are the most active and irritating as well, and next to this is purple. It would seem that the purple and violet, being more or less complementary of yellow, they would have this property more or less pronounced. That any kind or color of glass will cut out some of the irritating rays no one denies, but it would seem from the experiments that violet will cut out more of these than any other shade or color.

Discussion.—Dr. Posey congratulated Dr. Attix upon the merit of his paper, which was upon a subject now engrossing the attention of the scientific world. All had doubtless encountered cases in their practice of so-called sunburn of the eyes, and recognized the futility of attacking such forms of conjunctivitis by ordinary measures. Dr. Attix's statement that he had entirely relieved such an inflammation of the conjunctiva by a tinted glass was of great clinical interest. Dr. Posey recounted some of the dangers to the eye of excessive light, and gave the details of a case of cataract which he had recently successfully operated upon, where the lenticular opacity had been caused by a blinding flash in consequence of the short circuiting of an electric light. He recalled Louis Bell's experiments as a result of which that scientist had concluded that amber tinted glasses afforded the best protection to the eyes from injurious ultraviolet rays. Dr. Posey said that his

own experience had taught him that the best protection which could be afforded the eyes from excessive light was the diminution in its intensity through the medium of London smoke glasses. He doubted if there was scientific proof as yet to confirm clinical observations that certain tints of glass which altered the spectral quality of light had any real beneficial effect upon the eyes. He could not conceive why lenses which had their color changed by the effect of direct sunlight should necessarily be a protection to the eye.

Dr. Schwenk stated that the color of a glass must be in direct ratio to the amount of retinal irritation. He agreed with Dr. Posey that color diminishes the visual acuity. The color that has afforded the greatest relief in his experience is the Fienzal tinted glasses. Dr. Schwenk himself was relieved of a central scotoma, caused by looking into electric lights, by the use of this glass.

Dr. McCluney Radcliffe spoke of his favorable experience with amethyst glasses in cases of hyperesthesia of the retina, and with those who worked on bright colored substances, such as seamstresses, engravers and gold beaters. He said that a number of his patients had used them with perfect comfort at the seashore, and in traveling, instead of the disfiguring smoked glasses.

They soften the light, but do not darken objects, and are scarcely distinguishable from ordinary glasses except when seen on the edges.

Meeting of February 3, 1913. Dr. S. Lewis Ziegler, Chairman.

Multiple Pterygia.

Dr. William Zentmayer presented a case of multiple pterygia. The patient was a man 24 years of age, engaged in presswork. His attention had been called to the growths but two weeks before by a companion, but were evidently not so recent in origin. In O. D. there were three points at which the bulbar conjunctiva was drawn over onto the cornea: below, to the temporal side, and above. In O. S. there was one at the nasal side. The folds were small and nonvascular. They resembled the small attachments that are seen in marginal degeneration of the cornea.

Cicatricial Epicanthal Fold.

Dr. Zentmayer also presented a case of extensive scarring of the face with the production of a broad epicanthal fold. The patient, a girl aged 19 years, had been burned with acid when a child. The scar surrounded the outer angle of the mouth and extended upwards along the side of the nose, and at a point corresponding to the lower margin of the nasal bone a fold of normal skin of the upper lid was caught, producing a condition resembling an exaggerated epicanthus. The deformity was corrected by freeing the incarcerated fold and raising it by removing a crescentic area of skin from the inner angle of the lid just above the inner canthus.

Intranasal and Sinus Conditions in Their Relation to Ophthalmology.

Dr. Francis R. Packard addressed the society by invitation and discussed in detail the relation of intranasal and sinus conditions to certain ocular affections. He stated that though the ophthalmologist has classified the eye lesions of intranasal and sinus origin, from the rhinologist's point of view the pathologic conditions of the nose resulting in ocular disturbance have not been quite so fully exploited. The author, after considering the ordinary sinus conditions and the methods to be employed in their diagnosis, spoke of the nasal septum and its important bearing on intraocular manifestations. In our search for purulent sinus disease we are apt to overlook other intranasal diseases which are capable of causing very grave eye disturbance.

Discussion.—Dr. Posey complimented Dr. Packard on giving so concisely the various rhinologic lesions which might evoke ocular symptoms. He desired to refer briefly to another class of cases which Dr. Packard had not referred to, namely, those in which ocular symptoms were set up by a mere conjunction of the cells. He had noted in such cases marked though slight changes in the refraction, but was unable to explain how these occurred, but thought it not unlikely that they were dependent upon excitation of the ciliary muscles, in consequence of the action of toxins generated within the inflamed sinuses.

Dr. Posey referred also to the obstruction of the lacrimonasal duct, to which Peters had some years ago called attention, and to which the name of prelacrimal tissue is usually assigned,

citing the case of a young man recently under his care, who developed a large mucocele of the sac which had been successfully removed in toto a year previously. Recently a firm mass, conforming in its position and outlines to the laterally displaced wall of the lacrimoethmoidal cells, had appeared, which had occasioned some displacement of the eyeball. Incision into the orbit discovered the swelling to have been occasioned by a distension of these cells by a mucocele, in consequence of which the bone confining the contents of the cells had been apparently absorbed, the mucus being prevented from penetrating the tissues of the orbit by the thickened mucous membrane. After the evacuation of the cells, Dr. Geo. B. Wood, who was assisting him in the operation, opened a passage into the roof of the nose and secured free drainage into that organ through a large drainage tube. The orbital wound was then closed and a firm pressure bandage applied. Healing of the wound was prompt and there have been no complications. The tube will be removed after three or four weeks.

Dr. Samuel D. Risley said he was personally indebted to Dr. Packard for his thoughtful paper, based so obviously upon a large experience. Regarding the difficulty of diagnosis in disease of the sphenoid sinus, he was quite in accord. He asked whether Dr. Packard had observed anything characteristic in the pain. In one case Dr. Risley had seen, bitter complaint was made of a deep-seated "bursting" pain in the head. He asked whether the essayist favored opening the frontal sinus above the supraorbital ridge, stating his own preference for an incision into the floor of the sinus, since it was readily accessible, afforded better drainage and caused less deformity. Speaking of the congestion and stuffing of the nostrils and accessory sinuses, he thought it important to carefully consider the systemic conditions before proceeding to surgical procedures. Socalled "colds" were often the expression by the mucous membranes of intestinal toxemia and acidosis, and improved rapidly under suitable treatment of the faulty systemic state.

A New Point in the Technic of Blepharoplasty.

Dr. William Campbell Posey exhibited a woman upon whom he had recently restored the outer half of the upper right eyelid, which had been excised by another surgeon some months previously, on account of epithelioma, by a pedicle flap taken

from the forehead. To provide the flap with an epithelial lining, thereby preventing in a measure its later contraction and the irritation of the eyeball by the juxtaposition of the subcuticular tissues of the pedicle flap, he inserted a quadrilateral flap of skin from the fold of skin just below the brow and had turned it down over the eyeball, leaving its lower margin attached to what remained of the mucous membrane of the external portion of the superior cul-de-sac. Union had been prompt throughout, and he had been much gratified by the excellent contour imparted to the lid, by its motility which it had acquired by its attachment to the inner half, and by the soft skin lining of the lid, which was entirely nonirritating to the eyeball.

Tumor of the Ciliary Body.

Dr. Aaron Bray exhibited a patient, aged 32 years, who had consulted him for glasses. Upon examination it was found that the patient had a paralysis of the right external rectus muscle, and in the outer lower quadrant of the anterior chamber there was a distinct mass, 6x6 mm. in size, filling in the angle of the anterior chamber at that point. The mass was of dark brown color except in its extreme periphery, where the color resembled the iris. The mass was nonvascular, and was apparently causing no symptoms whatever.

J. Milton Griscom,
Secretary.

BOOK REVIEWS.

The Hunterian Lectures on Color Vision and Color Blindness.

By Professor F. W. Edridge-Green, M. D., Durh., F. R. C. S. Eng., Beit Medical Research Fellow. Published by Paul B. Hoeber, 69 E. 59th Street, New York. Price, $1.50.

This is a monograph of 76 pages, the reprint of two lectures delivered before the Royal College of Surgeons of England, February 1st and 3rd, 1911, respectively. The first lecture deals with the Theory and Facts of Color Vision and Color Blindness. He states that the rods under the influence of light liberate the visual purple, which stimulates the cones, whence the stimulus is carried to the color center in the cerebrum. The foveal cones receive their purple from the more peripherally lying rods, by way of canals in the retina. The image of small objects seen by the fovea will disappear when the purple is used up, but will reappear when a new supply reaches it. By appropriate experiments the flow of the purple in the canals can be seen subjectively. It is probable that light acting upon the visual purple is, according to its wave length, absorbed by particular atoms or molecules. The sensation of color is caused by the vibration of particular atoms or molecules.

The color sense is a product of evolution. First there is only the ability to distinguish between light and shade. The next step is a sensitiveness to different spectral rays. Finally, there arises the ability to distinguish between these rays, probably first between red and violet, and later other colors; i. e., dichromia, trichromia, tetrachromia, pentachromia, hexachromia, and heptachromia. Persons who belong to the latter class have a very highly developed sense of color perception. The evolution of the color sense consists in a splitting up of one of the colors seen by the next lowest class into two colors, each seen distinctly; e. g., blue-green into blue and green, in passing from tetrachromia into pentachromia. Color blind people are those who fall into any of the above classes, except the heptachromic and possibly the hexachromic. The usual form of color blindness described in the literature is the dichromic, and the patient is designated as red blind or green blind, according to which end of the spectrum is shortened.

The second lecture deals with the Detection of Color Blindness from a Practical Point of View. The tests should be of a practical character, that is, they should be such as to exclude from certain occupations those whose defect in color perception would make their employment dangerous. This includes trichromics, those with a shortened red end of the spectrum, and those who are unable to distinguish between red, green and white at a distance of two miles. This is best accomplished by the author's lantern test, which is described. The author describes also his classification test with wools and silks, and the color-perception spectrometer. C. L.

Ophthalmic Surgery.

By Dr. Josef Meller, Privatdocent and First Assistant at the K. K. II Univ. Eye Clinic, Vienna. Edited by Dr. William M. Sweet, Professor of Ophthalmology, Jefferson Medical College, Etc. Published by P. Blakiston's Son & Co., 1912. Philadelphia. Price $3.50.

This is the second edition of Meller's justly popular work. The text has been rewritten, new operations described, and additional illustrations added. C . L.

Die Sehschaerfe des Menschen und Ihre Pruefung (Human Vision and Its Testing).

By Leopold Löhner, Assistant at the Physiologic Institute at Graz. Published by Franz Deuticke, Leipsic and Vienna, 1912. Price 4 marks.

This monograph of 136 pages deals with the physiologic principles underlying the tests for vision. He first explains what is meant by vision, and divides the components of it into three parts—the preretinal or dioptric, the retinal or perceptive, and the postretinal—which he then discusses. Following this is a description of the methods of illumination and testing. A chapter is devoted to the different test objects, and another to a comparison of their values in testing. A very extensive bibliography is added. C. L.

Bulletin de la Societe Belge D'Ophtalmologie, No. 34.

This is a report of the patients presented and papers read before the Belgian Ophthalmological Society at the thirty-fourth meeting at Brussels, November 24, 1912. C. L.

NOTES AND ITEMS.

Prevention of Hereditary Blindness.

The Eugenics Record Office at Cold Spring Harbor, Long Island, New York, is proposing to study the laws of inheritance of retinitis pigmentosa, night blindness, maculocerebral degeneration, and amaurotic family idiocy, in order to gain knowledge that may guide persons belonging to strains affected with these conditions to make such selections of marriage mates as shall ensure immunity of the offspring from these inheritable eye defects.

To arrive at definite conclusions numerous data must be collected, and to aid in the study the cooperation of physicians is solicited. We urge, on behalf of a precise knowledge that will be of advantage to humanity, that all who have had cases of the above mentioned diseases will report them to the Eugenics Record Office.

Names are necessary to identify relationships, and addresses are asked for in order that, in certain cases, further inquiries may be made. No names will be published and all communications will be held as highly confidential. If you know of cases of the above named conditions, kindly state on postcard or by letter for how many cases you can give information, and this Office will send that number of brief schedules.

Address: "Hereditary Blindness," Eugenics Record Office, Long Island, New York.

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XV.

RETINAL DETACHMENT.

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Erlangen, Germany.

Translated by T. T. Blaise, M. D.,

Mason City, Iowa.

The various theories concerning the genesis of retinal detachment have not yet been universally accepted. This is in part due to the fact that retinal detachments—we speak here of the socalled spontaneous ones—have no common genesis, nor can they have such, and also because we seek the cause of the condition in the anatomic changes, which naturally represent results of various forces of diverse significance, in connection with clinical manifestations. Although in many cases the anatomic condition is found to be the basis, we must, on the other hand, remember that after all not very many cases have been microscopically examined, so that the report of another case is justified.

The case is that of a man of about fifty years of age, who presented himself at the clinic with the symptom of greatly elevated ocular tension. A striking appearance in addition to the ordinary symptoms of the elevated tension, and in con-

trast with primary glaucoma, was a decidedly increased depth of the anterior chamber. The intense pains, which he stated had continued for only a few weeks, together with the fact that the eye was already blind, rendered enucleation necessary.

Anatomic investigation revealed retinal detachment which certainly was not of secondary nature, but must have been primary, as may be concluded from the condition of the anterior chamber. The depth of the anterior chamber was materially increased, the sclerocorneal ligament was wide open, and the angle of the chamber was not changed in position, all of which are conditions directly the reverse from those in primary glaucoma. We must therefore consider the increased tension as secondary to the retinal detachment, a condition which is well recognized in the literature. If the retinal detachment had occurred after the glaucoma, then the conditions of the glaucoma, such as adhesions at the chamber angle as well as a decrease in the depth of the chamber, would necessarily have prevailed.

In the iris are found proliferating changes, which had led to an extensive adhesion of the posterior surface of the iris and the pupillary border to the anterior lens capsule. In the choroid are scattered foci of round cell infiltration, but most conspicuous are the changes in the ciliary epithelium. In the foreground of the picture we find an irregular pigment distribution, resulting in the main in a reduced pigmentation. In some places it was totally absent, and this lack of pigmentation extends over the entire ciliary processes. In addition to this there is an extension of the pigment to the adjoining parts, especially in the direction of the ciliary processes where bud-like extensions are observed. The cells themselves are frequently proliferated, forming projections, and the change in the cell nuclei is especially conspicuous; in addition to the apparently normal nuclei we find many with marked pycnosis and decided deformation. This is not confined to the inner layers alone, but is found also in the mostly diseased and depigmented outer layer. Here we find in the cells devoid of pigment practically only pycnotic nuclei. Cystic formations are also not uncommon here.

Although a certain degree of the changes belong to the typical senile changes of the eye, for the recognition of which

we must thank Kuhnt[1] and Kerschbaumer,[2] in this case, however, they appear in such a marked degree that they must without doubt be classed as pathologic. Still more is this true in the case of the cells of the pigment epithelium farther back as far as near the equatorial region. They are in a measure characterized by regressive metamorphosis of the epithelium, depigmentation in isolated places, increased aggregation of pigment as well as pigment destruction in adjoining parts, but partly by more or less marked proliferation. The latter causes an irregular broadening of the entire layer, which culminates at the ora serrata in a spindle shaped enlargement, decreasing gradually toward the equator. The origin of these cell proliferations may be traced to the pigment epithelium, and in this manner arise long epithelial bands. Hess,[3] Uhthoff,[4] Oeller[5] and Imre[6] also have pointed out this similarity with connective tissue proliferation. In the posterior part of the eye these appearances of proliferation are almost entirely absent, there being only isolated proliferations of circumscribed character here, which has led to a shedding and edematous swelling of the proliferated elements. These cell heaps lie free in the subretinal effusion.

The lamina elastica choroideæ is mostly well preserved, except that in isolated places a splitting of the membrane may be observed, and in one place a rent exists.

The choroid presents in general a normal texture, the vessels being well filled, and only here and there may be found round cell aggregations. The retina is totally detached and is suspended only from its fastening at the optic nerve and its anterior ending; nor does the detachment terminate at the ora serrata, but includes even the pars ciliaris retinæ up to the ciliary processes. While the anterior part of the retina presents changes of high degree, to such extent that anything like a typical structure cannot be discerned, the posterior portion is relatively well preserved, at least as concerns its gross anatomy. Even rudiments of rods and cones may be observed in isolated places, this circumstance pointing to the assumption that the detachment had not existed a very long time. This is of importance in comparison with many of the findings given in our literature, in which the long duration of the detachment was a factor. Naturally there is no lack of degenerative appearances in the posterior portion, but we shall not elab-

orate further on these conditions. It may be mentioned that on the temporal side of the retina there is a rent of 1 mm. sagittal and 0.3 mm. vertical dimensions. The borders of the rent are rounded off, presenting numerous secondary changes, so that it is certainly an old rent, which probably occurred simultaneously with the retinal detachment.

The vitreous body lies closely crowded together, especially on the temporal side of the lens. The individual fibers seem to present no changes and are apparently not shortened, their course being decidedly undulated. In the remaining portion of the vitreous body the constituent elements are scarce, while in the posterior portion of the retinal funnel they are almost totally absent. An interesting feature is the extraordinarily intimate connection between the vitreous and the irregular surface of the retina, especially in the anterior portion. This is especially well defined in the vicinity of the torn portion, at which place the masses of the vitreous seem to sink directly into the retina, as is revealed under appropriate staining (Mallory's connective tissue stain). Here it is plainly seen how the vitreous body elements unite with the similarly stained constituents of the degenerated retina, making a separation impossible. In the posterior portion a membrane arises from the vitreous and runs parallel with the retinal surface, but even here there are numerous minute fiber connections between this membrane and the retina.

It may further be mentioned that a membrane of one or more cell layers exists in the direction of the papilla, which increases in size as it approaches the optic nerve head, and arises from the glia of the latter. Back of the retina is an effusion rich in albumin, which on section reveals a minute granulated consistency. This mass fills the entire space between the detached retina and the choroid, and is also forced out through the rent in the retina into the vitreous. That portion of the vitreous body lying opposite the rent in the retina is thereby pressed aside. A mixture of this retroretinal fluid and the vitreous body fluid which contains less albumin did not occur.

If we again reconsider the fact that in the iris there occur inflammatory changes of proliferating character, and that likewise in the choroid there were recent although small inflammatory foci, and that degeneration and proliferating

inflammation of the pigment epithelial cells took place, which gave rise to high grade disturbances even in the region of the ciliary epithelium, we then have a linked chain of changes which extend over the entire uvea and above all the anterior portion. Conditions of this character are not in the least rare; on the contrary, it may be emphasized that states have been described in older reports that correspond very closely with the above conditions, although they may at times have been less explicitly brought out. The cause of retinal detachment is almost always given as a choroiditis, less frequently changes in the ciliary epithelium. It is unnecessary to review the individual cases, and the reader is referred to the reports of von Leber,[7] Nordenson,[8] Drüault,[9] Gonin,[10] von Hippel.[11]

If the changes here cited are not in exact details similar, there is nevertheless a marked general correspondence, especially as concerns the changes of the pigment epithelium. The frequent variations in the conditions of the recent and older inflammations of the choroid and the ciliary body turn up very often, and therefore may later have their intensity increased, but are in reality not to be considered as secondary in character.

The same is true of the iris. The observations on the ciliary epithelium are very meager, but Leber recently has directed our attention to this very point.

In agreement with our case, we have the pathologico-anatomic picture of a single disease, which, beginning in various parts of the uvea and the pigment layer of the retina, affects by far the greater portion of these structures, leading then to the further changes considered as secondary complications, viz., iridocyclitis, cataract and eventually phthisis bulbi.

Based on the findings here revealed, I come to the same conclusions as do Lauber[12] and Heine,[13] who on the ground of clinical considerations are also forced to the position that we deal here almost exclusively with separate appearances of the same disease, and that it is not permissible to accept the idea that the retinal detachment brought about an iritis or cataract.

Now as regards the real cause of the detachment, it is not necessary to consider further the opinions of the earlier authors, which are in a measure covered by my own opinion. Based upon the fundamental anatomic conditions in our case,

as well as those described in the literature referred to, it is to be expected that, due to the disturbances of the ciliary epithelium, a change takes place in the secretions of the eye fluids. It is to be presumed that this would lead to a reduction of the tension. That in case of retinal detachment a reduction of tension does in fact occur, Lauber was able to show in most cases, and the same has been known for a long time.

On account of these changes in the choroid and the ciliary body, disturbances must arise in the vitreous body, which, although it cannot be shown that they lead to disturbances of the fibrillæ in an atrophic sense, still cause abnormal connections of this body with the surface of the retina, as is shown in the specimen. This is especially conspicuous in the anterior portion. On account of these unequal connections at the juncture of these two structures, there must arise differences in the tension which must remain latent as long as the retina is connected.

While we must acknowledge a diminution of tension in the vitreous body, there must exist in the choroid a normal and eventually even a heightened tension, which is made apparent by the increased blood supply. Thus a decrease of tension arises in the direction from the choroid to the vitreous body. As this difference increases it will eventually approach a period where an increased transudation from the choroidal vessels must occur, the transudate impinging upon the retina and effecting a detachment of the already diseased and changed pigment layer. That, in fact, a higher pressure exists behind the retina than on the opposite side in the vitreous space can undoubtedly be observed by the behavior of the transudate. This latter presses into the vitreous space through the rent in the retina, pushing aside the contiguous structures into an outward bend. The transudation from the choroidal vessels continues until the pressure between the choroid and the vitreous body is equalized, or nearly so.

The vitreous body, on the other hand, is not to be disregarded. Its behavior as concerns the process of the retinal ablation is not purely passive in character, but it may actively draw the retina from its position. Normally the vitreous body is under certain tension, and in case of opening the bulb it would contract into a smaller space. If now firm adhesions exist, as there were in this instance in the anterior portion,

this tension makes traction on the retina directly. If the retina is already severed from its support, then the traction of the vitreous body, although slight, will draw the retina from its position. The replacing of the retina in this case would offer no difficulties, since the individual structural elements of the vitreous body are not shortened, while, on the other hand, in case of an actual atrophy, we must consider the reattachment of the retina as impossible. We may accordingly assume that the retinal detachment arises by virtue of pressure from behind, due to the retroretinal transudate, as well as by traction on part of the vitreous body from the opposite side.

It has been pointed out above that in this instance abnormal tensions arise on account of the various firm adhesions between the vitreous body and the retina, which become effective as soon as the retina becomes severed from its support. Should the latter become crowded from behind, it is quite conceivable that at such places of unequal forces the retina will be forced to yield and lacerate, similar to a soap bubble whose surface is touched at one place. It may also be that the direct traction force of the vitreous body plays its part. It is no wonder that the retina tears anteriorly, since at this place there is the closest relation between retina and vitreous, so that unequal conditions of traction become there especially manifest. Furthermore, the retina is much thinner in its anterior than in its posterior position, where it is enlarged by its blood vessels. The retinal tear has no special importance in the origin of retinal detachment; it must rather be regarded as an accidental though frequent condition. As a result of this theory concerning detachment of the retina, the explanation of the concomitant increase of tension causes no difficulty. We had seen that the anterior chamber was extremely deep, with a wide open iris angle, and an iris which had a bend backwards. If a decreased tension was present in the vitreal chamber with a normal tension in the anterior chamber, in order to equalize the pressure the iris-lens diaphragm would be pressed backwards, causing a deepening of the anterior chamber, as is often seen in retinal detachment accompanying hypotonia bulbi. In the anterior chamber there is also an apparently richly albuminous exudate, whose composition corresponds to the retroretinal transudate in density. An exit of the ocular fluids through Schlemm's canal

is thereby rendered very difficult, if not abolished. The specimen shows how these masses lie in front of the network of the ligament corneoscleralis, and do not penetrate it. Nevertheless, the spaces of the ligament are quite permeable. By this retention an increase of tension is caused, which retains the anterior chamber in its depths. A retention of this kind in the anterior chamber will never cause a bulging of the iris. To obtain the latter the pressure must be increased in the vitreous primarily, as I have shown in another place.[14]

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XVI.

MELANOTIC SARCOMA OF THE CHOROID COAT OF THE EYEBALL. REPORT OF A CASE WITH APPARENT SECONDARY INVOLVEMENT OF THE RETINA.*

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Sarcoma of the choroid coat of the eyeball is comparatively rare. Out of 137,545 eye patients, Fuchs observed but 91 cases of sarcoma of the uveal tract. Out of 351,779 eye cases Pawel found only 248 cases. Fuchs' percentage is .07, while Pawel's is .066. Buchanan (International Clinics II, 19th Series) states that intraocular tumors occur in .03 per cent of the eye cases at the Glasgow Infirmary. The proportion of uveal to retinal tumors is 20 to 1. Eighty-five per cent of the uveal sarcomata are in the choroid coat.

Both eyes are affected about equally, according to the combined figures of Fuchs, Pawel, and Lawford and Collins. The statistics favor the left eye but slightly. Fuchs' individual statistics favor the right eye slightly. In his 108 right eyes were affected thus to 101 left eyes.

More cases occur between the ages of 31 and 60 than at any other periods of life. Between these ages we have the most active time of life, which means exposure to more injuries of serious nature than at other periods of life.

However, as a cause of sarcoma of the uveal tract, injury to the eye does not seem to play a very important part, as we shall later see.

According to the combined figures of the authorities mentioned, 284 cases are noted between the ages of 31 and 60. From birth to 30 years, 71 cases are noted. Beyond 60 years, 80 cases, or a total before 31 and after 60 of 151. Before ten

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years of age it is extremely rare. This is quite in contrast with glioma of the retina

Statistics further show that men are more frequently afflicted than women. This may be used as an argument in favor of injuries as causes of the tumors, for men are more exposed because of occupation than women.

The statistics of Fuchs and Pawel show that melanotic sarcoma of the choroid occurs six and one-half times more frequently than the nonpigmented variety. However, Kerschbaumer studied 67 cases. She found that 13 (19 per cent) were true melanotic, 27 (40.3 per cent) were nonpigmented, and 27 (40.3 per cent) were pigmented, but the pigment was derived from the blood. Of her true melanotic cases, but eight were of the choroid coat. The rest were of the ciliary body, three, and epibulbar variety, two. She differentiates between the hematogenous and autochthonous varieties, which the others fail to do. In this respect her figures are the best available. Melanotic sarcoma of the choroid is a very rare disease indeed.

Sarcoma of the choroid may be either diffuse or circumscribed. The circumscribed variety sooner or later becomes diffuse by growth. In the early stages the growth is mushroom in shape. According to Parsons, the tumor grows twice as fast laterally as in thickness.

Histology.—These tumors may show both round and spindle shaped cells or either alone. There is a disparity between the figures of Fuchs and Pawel as to the frequency of each variety. Fuchs states that out of 229 melanotic tumors of the choroid, 62 were spindle celled and 39 were round celled. The spindle celled variety occurs 1.6 times more frequently than the round celled variety. Pawel found that out of 88 cases, 30 were spindle celled and but 9 round celled, i. e., the spindle cell variety occurred 3.75 times more frequently than the round cell variety. The disparity may be due to the manner of sectioning the tumors. A spindle cell cut transversely will look like a round cell Therefore search should be made for the nucleus of the cell. Even then if a spindle cell be cut transversely through its nucleus it will look like a round cell. The way to differentiate between the two is to tease out a portion of the tumor.

Round celled tumors grow faster than the spindle cell

variety. When the eye was enucleated in Fuchs' cases the round celled variety averaged 18½ months' duration, while the spindle cell variety averaged 30 months, and the mixed variety averaged 34 months' duration.

These tumors are very vascular. New formed blood vessels abound. They seem to be but simple tubes, having for their walls the cells of the growth. Hence extravasations of blood into the eye are quite frequent. These hemorrhages may be the cause of the glaucomatous symptoms which supervene sooner or later.

Pigmentation.—The pigmentation may be from one of two sources or both: (1) That formed by the cell itself, autochthonous, and (2) that from the blood, hematogenous. The latter abounds near the blood vessels and the former is some distance from the blood vessels, and is a product of cell metabolism. Virchow is of the opinion that the cell formation is of more value in diagnosis and prognosis of the condition than the pigmentation.

LaGrange (*Arch. d'Ophth.*, April, 1901) states his belief that the pigment of melanotic sarcoma comes from the pigment layer of the retina.

As the choroid coat is the pigmented coat of the eyeball in all its layers save the choriocapillaris, it seems reasonable that melanotic tumors would have their origin from the outer layers of the choroid, while leucosarcoma would spring from the choriocapillaris.

When the process has advanced it is impossible to distinguish the layers of the choroid.

The following classification of the pigment cells is proposed by Ginsberg:

1. Chromatophores: large spindle cells with long processes.
2. Transition cells: contracted chromatophores.
3. Polygonal cells: nuclei not seen because of the pigment.
4. Large round cells, as in alveolar sarcomata.
5. Retinal epithelium.
6. Leucocytes: in the neighborhood of hemorrhages.

LaGrange writes thus (*Arch. d'Ophth.*, Vol. XXI, No. 4, p. 177): "As regards the origin of the pigment, microchemical reactions do not permit us to distinguish hematogenous pigment from that arising in the cells themselves. The hematogenous pigment is found particularly near the vessels, the

autochthonous scattered through the tumor. The pigment arises chiefly from the normal cells of the choroid, although the blood also plays a considerable role. Tumors with hematogenous pigment appear to be less malignant than others."

To differentiate between autochthonous pigmentation and hematogenous pigmentation, Kerschbaumer proposes the following:

1. In autochthonous pigmentation, the pigment cells are uniformly distributed. In hematogenous, irregular clumps occur near extravasations, or along the vessels.

2. In autochthonous pigmentation there is a brownish black coloration and uniform fine granulation; in hematogenous, the color is golden to deep brown, and there is irregular, coarse granulation.

3. In autochthonous pigmentation the cells resemble normal chromatophores. In hematogenous they differ greatly in size and shape.

4. In autochthonous pigmentation no iron reaction is given; in hematogenous, this is present, especially in the stage of coarse granulation. (Parsons' Pathology of the Eye.)

To test for the iron present in the hematogenous pigment, any of the recognized tests will hold. Perls prefers the following: The section is placed for a few minutes in a 2 per cent aqueous solution of potassium ferrocyanid. Then it is transferred to a 1 per cent solution of hydrochloric acid. The iron stains blue. The iron is present as hemosiderin.

To test for melanin in the autochthonous variety, the addition of caustic soda will cause the pigment to turn red. According to Virchow, the addition of sulphuric acid to the section will turn the pigment green, which changes to blue and then red.

Degeneration may take place in the tumor. General necrosis may occur. The principal varieties of degeneration met with are hyalin, fatty, calcareous, glycogenous, or colloid, as in the specimen which I show. Knapp has found that the blood vessels of the choroid may be so compressed on one side of the tumor that anemia is present. The other side may show congestion.

Etiology.—It is a matter of common belief that the majority of sarcomata is due to injury. Fuchs' cases, however, show that only 11 per cent can be traced to injury as a cause.

while of the cases of Lawford and Collins, only 5 per cent. Evidently injury is but a minor cause.

Symptomatology.—It depends on whether the tumor is intraocular, or extraocular and intraocular. Hence there are two stages: (1) intraocular and (2) extraocular. The first stage is divisible into two periods: (a) the preglaucomatous and (b) the glaucomatous. The second stage is also divisible into two periods: (a) intraorbital and (b) metastatic. In the preglaucomatous period of the first stage, the patient notices a defect in the visual field, and this becomes more and more marked as the tumor grows. The perimeter will locate a scotoma in the field of vision corresponding to the site of the tumor. The scotoma grows until total blindness ensues. The ophthalmoscope shows the retina detached. It is liable to be different from idiopathic detachment in that the retina hugs the tumor. The retina and tumor may grow together, and the retina will hug the tumor, and the blood vessels of the retina may be traced a considerable distance without interruption over the tumor, whereas in idiopathic detachment the blood vessels cannot be thus traced because of the folding of the retina. When the detachment is complete, the retina is compressed towards the center of the eye, forming a funnel with its apex at the optic nerve attachment and its base at the ora serrata. Donec (*L'Ophtalmol. Provincial,* November, 1908) warns that the detachment may be diametrically opposite the tumor.

In the glaucomatous period of the first stage, the tension of the eyeball is markedly increased. This is due to the forward pressure of the tumor or hemorrhage into the eye, or both, which blocks the filtration angle of the eye. The eyeball becomes painful and inflamed by iridocyclitis. The cornea is insensitive and steamy. The anterior chamber is shallow and the iris discolored. The lens may become cataractous. The pain may be excruciating.

In the first period of the second stage the tumor has passed through the sclerotic and invades the orbit. The tumor soon fills the orbit and produces exophthalmos. In this period the pain subsides, and the tension is lowered also. It is then only a question of time when the second period of the second stage supervenes. The brain is liable to involvement, and then, in order of frequency, the liver, lungs and stomach.

Sarcoma of the choroid may exist without any symptoms. Wintersteiner (*Ophth. Gesell.* in Vienna, March, 1909) records two such cases. In one the patient died shortly after a cataract operation. Examination of the eye showed a flat leucosarcoma one-half mm. thick and five to six mm. in breadth. The other case suffered from sarcoma of the orbit. Enucleation of the eye revealed therein a choroidal sarcoma two mm. in diameter. A similar experience occurred in the practice of a former associate of mine, Dr. A. C. Bartholomew, now of South Bend, Ind. He operated for cataract in an old lady. The operation proved unsuccessful and he was compelled to

Transverse section of eyeball.

enucleate the eyeball. Examination of the interior of the eyeball revealed a sarcoma. The case is as yet unpublished.

Sympathetic inflammation is always a possibility. Such cases have been reported by Schirmer, Ziegler, Pawel, Noyes, Waldyer, Brailey, Fuchs, Knapp, Schüppel, Ritter, Angellucci, Hirschberg, Pagenstecher, Leber, Knies, Lawford, Milles.

Diagnosis.— As intimated above, the first symptom is a disturbance of vision at the point of tumor formation. The ophthalmoscope in the early stages of the disease will reveal the point of detachment. If the case is seen too late for diagnosis by the ophthalmoscope, then resort must be had to trans-

illumination. For the anterior portion of the eye the instrument of Würdemann is valuable. If the tumor is posteriorly, the diaphanoscope of Hertzel is to be preferred. The latter is a water cooled lamp of eighty candle power illumination. It is introduced into the mouth after the current of water has been set going. The mouth is closed over the instrument and the light turned on. It is best to put over the face a black

Section at optic nerve entrance, showing the large blood channels. (55X.)

mask with holes through which to observe the eyes. If no tumor is present, the previously dilated pupil lights up uniformly. If a tumor is present the pupil is dark. Of course transillumination must be performed in a darkened room. If the tumor be situated in the upper posterior portion of the eye, transillumination fails. The diaphanoscope settles two questions: First, that a tumor is, or is not, present, and second, if

present, no time should be wasted in removing the eye and protecting the patient. For some yet reserve a positive diagnosis as to the presence of a tumor in the eye, until the symptom of pain appears. Then it may be too late to save the life of the patient, as metastasis may have been established.

Pentschler (*Centralbl. f. Augenh.*, 1906, p. 139) diagnosed a case of sarcoma of the choroid by a dark mass which had accumulated like an hyphema in the anterior chamber. It measured 2 mm. high. A portion, removed by puncture of the cornea, revealed pigment as found in sarcoma. Enuclea-

The sarcoma involving the retina. (35X.)

tion of the eye revealed rarefaction of pigment in the choroid and a sarcoma covering the optic disc from all sides. Reis (*Zeitschrift f. Augenh.*, 1900, p. 311) warns against all exploratory operations in supposed intraocular neoplasms, since they are apt to produce extrabulbar propagation or general metastasis. He advises the removal of all blind and painful eyes.

Shrunken eyes may be the seat of sarcoma. Such cases have been reported by Bielsky, Wallerhofer, Pawel, Reis, Ewetsky, Weinstein, Kipp, Kerschbaumer, Silex, Schultz, Key, Schottelius, Meyerhof. The total is 19 cases.

Prognosis.—The prognosis is good in these cases, provided the eye is enucleated while the tumor of the choroid is young and small. If the tumor be allowed to pass into the first period of the second stage, exenteration of the orbit will be necessary. Then it may be too late to save the life of the patient. In any event, the prognosis must be guarded, as the blood stream may have carried tumor cells to distant parts of the body, even while the tumor is small and producing no prominent symptoms. Metastases or recurrences occur more

Showing secondary involvement of anterior portion of retina which has been pushed forward by the growth of the tumor. (55X.)

frequently in the mixed type, to the exent of 37 per cent; in the round cell type, 20 per cent, and in the spindle cell type, 19 per cent (Parsons). Hirschberg believes that patients who remain healthy four years after enucleation of an eye with choroidal sarcoma should be considered completely cured.

Treatment.—As intimated above, enucleation of the eye must be performed if the tumor be intraocular, and in addition to that, exenteration of the orbit, if the tumor be extra-

ocular, in the hope that the neoplasm had not spread to distant parts of the body. Otherwise there is no curative treatment.

In my own experience, I have encountered just an even dozen sarcomata of the choroid, and I desire to submit the last case:

Mrs. M., age 61, consulted me August 5th, 1911. She was referred by her physician, Dr. Tindell, of Muncie. For three

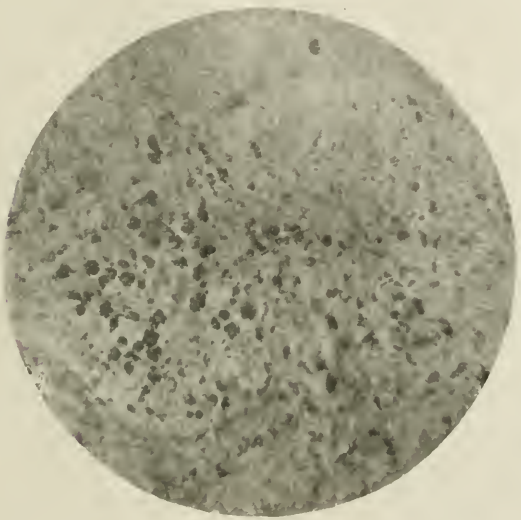
Section of choroid showing tumor mass shading off into the colloid degeneration. (55X.)

weeks prior to her visit she had suffered great pain in the right eye, which had been blind for six months. Examination of the eye showed it to be the seat of iridocyclitis. The cornea was steamy and insensitive. The anterior chamber was very shallow. The tension was plus 3. Transillumination by the lamps of Würdemann and Hertzel was negative. Diagnosis: A new growth in the eyeball, probably sarcoma. She was

advised to have the eye enucleated. It was done the same day at St. Elizabeth Hospital, this city. The patient was thus relieved of all pain.

The enucleated eyeball was placed in a five per cent solution of formalin for one day and then transferred to a ten per cent solution for a week. It was then frozen and bisected transversely. One-half was mounted in glycerin jelly and the other half was given to Dr. Oliver P. Terry, of the biologic department of Purdue University, to be sectioned.

Macroscopically the eyeball is 23 mm. in diameter trans-



The chromatophores. (200X.)

versely and 22 mm. anteroposteriorly. Growing from the optic nervehead inward is seen a whitish mass which shades off into the darker mass which completely fills the eye. The retina is detached at all points save at its attachments to the optic nerve and the ora serrata. It is compressed inward so that it forms a funnel. Within the funnel is an extravasation of blood.

Microscopically the choroid coat in the immediate vicinity of the optic disc will be found very greatly thickened and honeycombed with large blood vessels having for their wall the cells of the tumor. At points will be found large quan-

tities of dark pigment. Considerable extravasation of blood is seen. Following the choroid towards the ciliary body the tumor mass will be found to shade off into the normal choroid. Following the tumor mass backward it will be found that the optic nervehead is overgrown by the tumor. Passing toward the center of the eye, the cells seem to shade off into the colloid degeneration in the center of the eye. The nuclei of the cells become fainter and fainter and are lost after a while in the colloid substance.

Just back of the lens in the retina will be found a proliferation of round cells, which give us the impression that the retina may be secondarily affected by the process present in the choroid coat. If the detached retina be followed backward, we come to a marked increase in cell proliferation involving the internal and external molecular layers. The other layers of the retina become indistinguishable in the mass of new cells. Adjoining this mass is the colloid degeneration into which the retinal cells seem to fade. Both round cells and spindle cells abound.

If sections be placed in a 2 per cent aqueous solution of ferrocyanid of potassium and then transferred to a 1 per cent solution of hydrochloric acid, blue discoloration is produced, indicating hematogenous pigment. (Perl's reaction.)

If sections be placed in a solution of sodium hydrate, a red discoloration is produced, indicating the presence of melanin. However, it is fair to state that we fail to get the play of colors with sulphuric acid. (Virchow's reaction.)

Diagnosis.—Melanotic sarcoma of the mixed type.

With this article are submitted photographs and photomicrographs of the eye. For these I am greatly indebted to Dr. R. A. Craig of the department of veterinary science of Purdue University.

XVII.

ON THE VALUE OF PRISMS IN OPHTHALMIC PRACTICE.*

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PHILADELPHIA.

Prisms are used in ophthalmic practice for purposes of diagnosis and treatment. It is to the latter phase that attention will be directed in this paper. Prisms as a means of treatment are generally prescribed either for exercise or in the position of rest.

EXERCISE PRISMS.

The use of prisms for the exercise of abduction and adduction dates back many years. It is probable that Dyer was the first (in this country at least) to employ them in this way.[1]

Dyer's method (*Transactions of the American Ophthalmologic Society*, Vol. I), set forth by him in 1865, that is to say, almost fifty years ago, was a purely gymnastic one. The patient was provided with square prisms of $2^1/_2$ degrees, 5 degrees, 10 degrees and 15 degrees. A candle flame at 20 feet was taken as the object, and efforts at increasing abduction and adduction were performed by this method. The session was about ten minutes, once daily at first and twice daily later, as the muscles and fusion power gained facility. He found that it often required weeks to reach an adduction of 40 degrees and an abduction of 10 degrees.[2]

This method was soon after taken up by Henry D. Noyes and with slight modifications by Wm. Thomson of Philadelphia, who practiced and taught it. Later Gould indulged in further modifications. Observing that a strong psychic impulse to convergence is induced by looking at any object at the occupation distance (13 to 20 inches), he began the exer-

*Presented to the American Academy of Ophthalmology and Otolaryngology, at the Niagara Falls meeting, August 20-22, 1912.

1. No reference will be made in this communication to stereoscopic exercises, as that is a subject within itself.

2. It is a noteworthy fact that no other paper on the use of prisms or on heterophoria appeared in the Transactions of the American Ophthalmologic Society for twenty-three years after Dyer's paper in the first volume.

cise of this distance and had the patients recede from the candle flame until they had reached 20 feet, when they retraced their steps and repeated the process. By taking advantage of the strong convergence impulse at 13 inches and requiring the patient to put forth this same impulse through a pair of prisms and hold it out to 20 feet, Gould accomplished what he aptly called "weighting the convergence," for this is just what is done. In our hands it has proven one of the most valuable forms of prism exercise in convergence insufficiency or exophoria.

Prisms bases out may also be used in exercising the convergence at the occupation distance (13 to 20 inches), by having the patient survey a lead pencil point, a tiny electric light or any other small object, which is to be moved forward and backwards through the near range of convergence. This may also be performed to the right and left (at an angle of 45 degrees to the median line of the head), as far as the patient's arm length will permit.

Prism exercises for hyperphoria were tried early in our work and abandoned because of the almost uniformly bad results obtained. The usual complaint was of great aggravation of the symptoms following the prism exercises. On looking over our private records of 7,000 consecutive cases, we found that muscular anomalies were detected in 1,276 instances. In 267 individuals the use of the refractive correction alone was sufficient to dispel their symptoms, and no treatment was directed to the muscular anomaly.

In the 1,008 remaining cases symptoms traceable to the muscular imbalance were in evidence, and some manner of prismatic treatment was resorted to. Analysis of these 1,008 cases reveals the following:

In 190 cases of exophoria, prisms were ordered for exercise only.

In 28 cases of esophoria, prisms were used for exercise only.

In 252 cases of exophoria, prisms were incorporated in the patient's glasses in the position of rest for continuous use.

In 160 cases of exophoria, prisms in the position of rest were incorporated in the patient's reading correction only.

In 28 cases of esophoria, prisms were incorporated in the glasses in the position of rest for permanent use.

In 330 cases of hyperphoria (164 right hyperphoria, 172

left hyperphoria), prisms were incorporated in the glasses in the position of rest for permanent use.

In 14 cases of hyperphoria, prisms were ordered for purposes of exercise.

These cases with their results tabulate themselves as follows:

Anomaly.	No. of Times Prescribed.	Result — Good.	Poor.	Unknown.
Exophoria	190	130	46	14
Esophoria	28	14	8	6
Hyperphoria	14	1	10	3

Study of the table shows the great preponderance of convergence anomalies. Perhaps this is for the reason that low grades of esophoria seldom require exercise. By low grades we mean anything below 4 degrees. Esophoria of 6 degrees is generally amenable to a full refractive correction or even plus 0.50 or plus 0.75 added for a reading correction. The few outstanding cases that present symptoms in spite of the foregoing treatment are sometimes benefited by prism exercise, as above indicated. One-half of such esophoric cases in this series were vastly helped in this way. A few more went on to the permanent use of prisms in their refractive correction, but this will be touched on later. Suffice it to say that prism exercises in the higher degrees of esophoria have proven of some service in our hands, but they are quite as likely to fail of their object, and the patient should be made acquainted with this fact.

Prism exercises in exophoria were employed in 190 cases, of which 130 showed marked improvement, 46 either showed no improvement or their symptoms increased under the exercise, and 14 did not report back, so that the result in these 14 is unknown.

If exophoria is the outward manifestation of divergence excess, prism exercise may improve the ocular condition, but it is much more likely to aggravate the uncomfortable state of the eyes. Of the 46 cases of exophoria that did not show any improvement under exercise, 28 fall in this category. All but 6 of them eventually went on to the permanent use of prisms bases in.

Many forms of convergence exercise were indulged in, but Gould's method of weighting the convergence proved the most fruitful. Most of these patients were started on a pair

of 5 degree prisms, with which they made ten trips across the room, ten times on arising and twenty-five times before retiring. This was continued for two weeks, and then ten degree prisms were similarly used for two weeks, and then fifteen degree prisms in the same way for two to four weeks. This strength was never exceeded. Indeed in the majority of cases where improvement occurred the symptoms had entirely disappeared by the time the fifteen degree prisms were reached, and they were only used to clinch the cure. The type in which these exercises were of greatest value were the convergence insufficiencies in which abduction did not exceed 7 degrees. In such cases the exophoria would vary from 1 to 5 degrees for infinity, with an exophoria at 13 inches of from 8 to 16 degrees. Such cases we approach with much confidence, and we are not often disappointed if the patient will only properly cooperate. They must be dominated into doing the exercises, however, by holding over them the threat of incorporating in their glasses heavy prisms if they are not willing to do their part. Similar exercises at the occupation distance were occasionally ordered, according to the needs of individual cases, and in a few cases they were used to the patient's right and left.

Prism exercises for hyperphoria were tried in the early days of our work, but the patients complained of them so bitterly that they promptly fell into disuse. We freely acknowledge that some workers have had satisfactory experiences with such treatment of hyperphoria, but we have not been able to secure such fortunate results ourselves.

PRISMS IN THE POSITION OF REST.

Our findings in this class of cases tabulate themselves as follows:

Anomaly.	No. of Times Prescribed.	Result		
		Good.	Poor.	Unknown.
Esophoria	28	24	2	2
Exophoria (Prisms for constant use.)	250	193	26	33
Exophoria (Prisms for reading only.)	160	135	15	10
Hyperphoria	336	297	29	10

The subject of permanent prisms for constant use seems to be by no means settled. The argument for them has not changed in the last twenty-five years, nor have the arguments against them brought forth any new ideas. Dyer began the use of prisms in assisting people with defective convergence to read by ordering them 1, 2 and 3 degree prisms, bases in, with which they would read for increasing periods of time.

Noyes observes in his text book of 22 years ago: "It is common to find that wearing prisms a little while increased the manifest amount of muscular weakness. . . . The overtasked muscles give up the struggle and lean on the glasses; hence it frequently follows that prisms are a prelude to tenotomy. . . . My conclusions from recent experience is strongly in favor of the helpfulness of weak prisms continually worn."

Although this was written 22 years ago, when oculomyology was in its infancy, it acords perfectly with our experience today. We freely admit that prisms are but crutches that in many cases must be added to from time to time; we freely admit that nothing is quite equal to rational right living in the treatment of all such functional disorders; but we submit that after everything comprehended under the term right living has been done, it is often necessary in many cases to finally resort to permanent prisms to alleviate the symptoms of which our patients complain. Indeed the choice lies between prisms and tenotomy in such cases, and our own preference is for prisms first and tenotomy afterward, if the prisms prove insufficient. In the 775 cases for whom permanent prisms were ordered, but 72 failed to find relief (that is, less than 1 in 10); of this number 53 came to tenotomy; once for esophoria, 22 times for exophoria and 30 times for hyperphoria. Moreover, the time devoted to the study of these cases with prisms and otherwise, and the failure of the prismatic correction to bring relief, afforded very precise indications for tenotomy, such as can never issue from a study of a case during one or two visits. The 28 cases of esophoria referred to in the last table were all of 8 degrees or more. In fact, we do not remember ever ordering permanent prisms for an esophoric presenting less than 8 degrees of imbalance.

With exophoria the case is different. Four degrees for infinity is always worth considering, especially if it is associated

with an abnormal convergence near point (greater than five inches). Under these circumstances we have never hesitated to prescribe appropriate prisms, and usually with the most gratifying results.

In the presence of an exophoria that reveals itself wholly, or almost wholly, at the reading distance, there is no longer any doubt in our minds as to the great value of the 1 degree prism base in, to be incorporated in the reading correction only, when gymnastic training is unavailing. The fact that we have secured good results from this practice in 135 out of 150 cases is sufficient in itself.

As to hyperphoria we have come to be equally dogmatic. Of all permanent prisms none offer as much promise as the vertical prism when the case has been carefully selected. When all other factors have been excluded, a vertical prism is plainly indicated when the hyperphoria definitely equals or exceeds 1 degree. Less than this amount is frequently not significant. More than 3 or 4 degrees usually means absence of binocular vision, if a vertical prism has not been previously worn. Vertical prisms are tolerated and well tolerated up to 4 to 6 degrees in each eye, if gradually worked up to. A patient whom we have had under observation for twelve years wears—

R. plus 2.00 sphere plus 1.00 cyl. axis 135 degrees combined with a 4½ degree prism base up.

L. plus 1.75 sphere plus 0.50 cyl. axis 180 degrees combined with a 4½ degree prism base down.

For near work add plus 3.00 sphere.

A more complicated formula could not be devised. This is worn in a toric invisible bifocal and has been for three years past. The patient is very happy with them, enjoys vision of 5/5 in each eye and uses her eyes hard as she is an omnivorous reader. Only three-fourths of her prismatic error is corrected. The mistake too often made is that of ordering too great strength of prism in the first prescription. If we were asked to lay down some manner of general practice for the ordering of permanent prisms, it would be to err on the side of conservatism, say one-half of the total deviation for infinity in hyperphoria and one-quarter to one-third of the total deviation for infinity in lateral imbalance, whether esophoria or exophoria. This will almost surely leave the surgeon within safe bounds, and if prisms thus ordered are not comfortably borne, it is a

certainty that anything near the full strength would only accentuate the patient's symptoms.

In conclusion we can only say that a practice that can show 145 good results in 232 attempts at prism exercise, and 619 good results in 776 prescriptions for permanent prisms, seems to have justified itself. And yet there is no department of ophthalmic science which more requires that the surgeon shall be not only a thoroughgoing refractionist and oculomyologist, but also something of a neurologist and an all-wise general practitioner.

XVIII.

COLOR ADAPTATION.

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London.

As in dark adaptation there is a considerable effect which takes place immediately on entering a dark room, but which increases with the length of stay and the degree of darkness, so is there a considerable effect produced when a person enters a room illuminated by an artificial light, having previously been in daylight. This effect, which may be designated color adaptation, increases with the time during which the eyes are subjected to the adapting light. I have estimated the effect of color adaptation in four ways.

I. A dark room being illuminated by light of a certain wave-length, one eye is subjected to light of this wave-length whilst the other is closed, and is therefore in a state of more or less dark adaptation. The dark room communicates with another dark room by a door in which a hole is pierced to allow the passage of the eyepiece of my spectrometer.* A certain region of the spectrum is isolated by my spectrometer; and, after the stated period, this is examined first by the eye which has been exposed to the light, and then with the eye which has been covered up. The same spectral region is also observed after both eyes have been subjected to the adapting light.

II. The second method consists of wearing a pair of spectacles glazed with colored glass, and noticing the changes which

*Royal Society Proceedings, B, 1910, vol. 82, p. 458; Hunterian Lectures on Color Vision and Color Blindness, p. 73, Kegan, Paul & Co.

appear in colored objects viewed through these glasses for a longer or shorter period. No light is allowed to enter the eye except through the colored glasses. As the composition of the light which passes through the glasses is known, those changes which are due to the absorption of light by the colored glass can be separated from those which cannot be accounted for in this way. Definite spectral regions are examined first immediately after putting on the glasses, and then again after a longer period.

III. The third method is to note the changes which appear in colored objects in a room illuminated by light of known composition, which cannot be explained by the character of the light.

IV. The fourth method is comparing the appearance of colors in a photometer, one color being illuminated by daylight, and the other by artificial or colored light. The objects are then examined first by daylight, and then by the artificial light which has been used. The difference between the results obtained in this way and those of the photometer represents the effects of color adaptation. The same colors are also examined in the photometer, both sides being illuminated first by daylight and then by artificial light.

When a spectrum is examined after the eyes have been exposed for twenty minutes in a room illuminated only by sodium light, the yellow appears to have disappeared from the spectrum. The red and green appear to meet without any intermediate colors, and the red, orange and green have lost any yellow character which they previously possessed. There is no increase in the blue or violet, and the red and green are not diminished. If, before exposing the eyes to the sodium light, a small portion of terminal red be selected, this is found to be just as visible after the exposure as before.

The same condition is found with artificial light in which the yellow rays predominate. Yellow is discriminated with difficulty from white by electric light ("Osram" incandescent). It is often impossible to detect a yellow stain on a white cloth by this electric light which is very obvious and marked by daylight.

When blue-green spectacles are first put on all white objects appear a vivid blue-green. This blue-green gradually fades until, in about ten minutes' time, a piece of white paper or white cloth appears absolutely white, without a trace of blue-green. In fact, though I know that blue-green light is falling upon the eyes, I can see no trace of this color. This shows conclusively how very little the conscious judgment contributes to these results, apart from the perception of relative difference. If the sky be white, misty, and overcast, this will appear only faintly colored blue-green; if it be much brighter, or a naked filament of an electric light be looked at, these are seen as blue-green. Black objects appear black throughout. I have never been able to find the faintest tinge of red in a black object. When the spectacles are removed white objects appear a decided rose pink, and a perceptible interval elapses before objects regain their normal color.

I found that I could read all Stilling's pseudoisochromatic tables for testing for color blindness with the blue-green spectacles on. An examination of the spectrum immediately after putting on the blue-green spectacles showed that there was no red to be seen; there was a small amount of orange, and the yellow, green, blue, and violet were visible. After wearing the glasses for about ten minutes until white appeared white, and then again examining the spectrum, there was no marked change in the orange or any other part, with the exception of the green, which looked paler and more yellow. I picked out the yellow of the spectrum by means of the shutters of the spectrometer at exactly the same wave-lengths with and without the blue-green spectacles, and with shorter and longer periods of color adaptation. The sodium flame appears less red through the blue-green glasses, and there is no change to red after there has been color adaptation. This shows conclusively that yellow is a simple sensation and not compounded of red and green sensations. If it were a compound sensation it should appear red after color adaptation to green. The results are in accordance with those of color fatigue.* The experiments on color adaptation with the sodium light and the subsequent disappearance of yellow from

*Royal Society Proceedings, 1912, B, vol. 85, p. 434.

the spectrum show that the yellow sensation is stimulated by the green, orange, and red rays as well as by the yellow. This is in accordance with the facts of color mixing, and explains why red and green light make a yellow when mixed.

An examination of definite regions in the green isolated in my spectrometer shows that the region corresponding to the dominant wave-length of the glasses is most affected; the regions on the blue side and the yellow side appear bluer and yellower respectively.

The following colored cards were used for comparison in the photometer:

Color by daylight	Color by elec. light (Osram incandesc't)	Color by daylight	Color by elec. light (Osram incandesc't)
1. Yellow	Pale orange	12. Chocolate brown	Terra cotta brown
2. Orange	Orange	13. Blue	Saturated ultramarine blue
3. Slate	Grey		
4. Blue	Blue	14. Brown	Chocolate brown
5. Yellow-green	Yellow-green	15. Dark slate	Dark grey
6. Green	Green	16. Rose red	Red
7. Brown	Light brown	17. Rose	Rose
8. Dark green	Greenish-black	18. Orange	Orange
9. Olive green	Dark green	19. Black	Black
10. Yellow	Yellow	20. Brown	Brown
11. Orange-yellow	Orange-yellow		

It will be noticed that there is very little difference in the appearance of the colors by daylight and by electric light. This is due to color adaptation. If, however, two cards of the same color be placed in a simple photometer which I have had constructed for the purpose, and one side be illuminated by daylight and the other side by an Osram electric light, the difference is very striking. The eye which examines the colors in the instrument must have been previously in a state of daylight adaptation. It will now be found that 13 blue illuminated by electric light almost exactly matches 12 brown illuminated by daylight.

The following shows the changes in the appearance of the colors of the previously mentioned cards when two exactly similar cards are illuminated in the photometer on the one

side by daylight and on the other by Osram electric light. The eye used was daylight adapted:

Illuminated by daylight	Illuminated by electric light (Osram incandesc't)	Illuminated by daylight	Illuminated by elec tric light (Osram incandesc't
1. Greenish-yellow	Orange	11. Greenish-yellow	Orange
2. Brown	Orange	12. Chocolate	Orange
3. Slate	Brown	13. Blue	Purplish-black
4. Blue	Grey	14. Brown	Orange
5. Green	Yellow	15. Slate	Brown
6. Green	Greenish-yellow	16. Rose red	Scarlet
7. Brown	Orange	17. Rose	Orange
8. Green	Yellow-green	18. Brown	Yellowish-orange
9. Pure green	Dark yellow	19. Blue-grey	Yellow-brown
10. Greenish-yellow	Orange	20. Brown	Orange

It will be seen that color adaptation greatly assists the correct discrimination of colors.

The same cards were now examined in exactly the same physical conditions; that is to say, two exactly similar cards were placed in the photometer, and one side was illuminated by daylight and the other by electric light. The eye used for viewing the cards was adapted to electric light by viewing white paper illuminated by electric light (Osram incandescent) for from five to ten seconds. The cards used were the same as before. The following results were obtained:

Illuminated by daylight	Illuminated by electric light (Osram incandesc't)	Illuminated by daylight	Illuminated by elec tric light (Osram incandesc't
1. Green	Orange-yellow	11. Greenish-yellow	Orange-yellow
2. Buff	Orange	12. Purple-brown	Orange
3. Blue	Grey	13. Bright blue	Dark blue
4. Bright blue	Blue-grey	14. Grey	Brown
5. Green	Yellow-green	15. Slate	Grey
6. Blue-green	Yellow-green	16. Rose	Red
7. Grey	Pale orange	17. Purple	Orange
8. Blue	Black	18. Purple-brown	Orange
9. Green	Yellow-green	19. Blue-black	Black
10. Yellow-green	Orange-yellow	20. Grey	Light brown

When a match had been made to the daylight-adapted eye of chocolate brown 12 illuminated by daylight, and blue 13 illuminated by electric light, and this was viewed with an eye adapted to electric light, the two no longer matched, the blue now appeared blue and the brown pale purple.

No color is seen by color adaptation unless the corresponding physical stimuli are present in the light reaching the eye. On remaining in a room illuminated by light through red glass windows, green will become increasingly noticeable, but only when a certain amount of green light is transmitted by the red glass. If, however, a red glass be used which is impervious to green, not a trace of green will be seen in green or black objects. A simple yellow still appears yellow after adaptation to electric light, but a compound yellow, which appears pure yellow by daylight, and which is compounded of red and green, appears greenish-yellow after adaptation to electric light.

Color adaptation appears to produce its effect by subtraction, and not by the addition of any new color sensation which is not previously present. The ultramarine blue which, when illuminated by electric light, matches a chocolate brown illuminated by daylight, appears blue after color adaptation to electric light through the subtraction of the yellow element of the light reflected from the card. A blue sky appears much bluer when viewed from a room illuminated by electric light than it does when seen from an unlighted street, because, when viewed in the latter position, the eyes are adapted for the light of the sky, and, when viewed from the room, any yellow element is subtracted.

SUMMARY.

1. In color adaptation, the retinocerebral apparatus appears to become less and less sensitive to the color corresponding to the dominant wave length, and to set up a new system of differentiation.

2. When light of a composition differing from that of daylight is employed to illuminate objects, an immediate and unconscious estimation of the colors of these objects is made in relation to this light, the light employed being considered as white light.

3. No color is seen of which the physical basis is not present in the light employed.

4. When spectral regions are examined with a color adapted

eye, that of the dominant wave length appears colorless, whilst those immediately on either side of it appear to be shifted higher and lower in the scale respectively.

5. There is immediate color adaptation, as well as color adaptation after a longer stimulation with the adapting light.

6. Colors which correspond to the dominant wave length of an artificial light are with difficulty discriminated from white by this light.

7. Color adaptation may bring two colors below the threshold of discrimination, so that the two appear exactly alike, although by another kind of light a difference is plainly visible.

8. Color adaptation increases the perception of relative difference for colors other than the dominant.

9. The conscious judgment has very little effect in color adaptation.

10. Color adaptation greatly helps in the correct discrimination of colors and masks the effects of the very great physical differences which are found in different kinds of illumination.

11. Spectral yellow, after color adaptation to green, still appears yellow, and not red.

12. Color adaptation appears to produce its effects by subtraction of the dominant color sensation, and not by directly increasing the complementary. Spectral blue does not appear brighter after color adaptation to yellow.

XIX.

THE USE OF A CONJUNCTIVAL FLAP IN THE TREATMENT OF CORNEAL INFECTIONS AND OF PANNUS.*

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BUFFALO.

After an experience with the procedure, extending over a period of several years, I have come to consider the method of treating grave corneal infections by means of a flap of transplanted conjunctiva as one of the most valuable which we have at our disposal, outranking the actual cautery, both in the certainty of its action and in the superiority of its final effects.

The operation consists in covering the ulcerating area with a flap of conjunctiva dissected from the eyeball, and the method of doing this is determined somewhat by the location and extent of the ulcer.

After the usual preparation of an eye for operation, the ocular conjunctiva is divided close to the corneal margin for a distance sufficient to insure complete covering of all ulcerated parts. Then from each end of this cut the conjunctiva is divided, these cuts being carried well back on the eyeball so as to make a flap of conjunctiva, and the flap, when dissected loose from the eyeball, is drawn across by means of sutures and stitched to the conjunctiva on the opposite side of the cornea.

As this operation is usually reserved for extensive ulcers, it follows that usually a large part of the cornea is covered by conjunctiva; although an ulcer limited to one margin of the cornea can be covered by a flap drawn across an arc of the corneal circle.

It is advisable, when possible, to make the flap long enough so that the stitches which hold it in place lie outside the corneal

*Read before the American Academy of Ophthalmology.

ring, lest, possibly, they injure the cornea. But in many cases, owing to swelling and inflammatory changes in the conjunctiva itself, it is impossible to stretch this tissue entirely across the cornea, so that a flap from each side must be made and the two joined by stitches over the middle, or some part of the cornea. In this event care must be exercised to avoid injury to healthy cornea; yet, as a matter of fact, I have never seen any harm follow the use of stitches in this situation, although I have many times so placed them. The stitch when drawn tight so imbeds itself in the conjunctiva as to be harmless to the cornea.

Usually some or all of the stitches loosen and give way at the end of four or five days, although they frequently remain as placed several days longer. If the sutures hold, they may be left in place for a week or longer, although I have seldom left them for a longer period than a week.

As they loosen or are removed, the conjunctival flaps gradually retract and within a few days go back into place and the cornea is left uncovered, unless, as may happen, the conjunctiva has attached itself to the cornea more or less extensively over the ulcerated area. When the conjunctiva becomes attached to the cornea, subsequent changes vary in different cases. At first the adherent conjunctiva is very vascular and may become somewhat thickened, forming a permanent opaque covering at the site of the ulcer. Sometimes a bridge forms connecting the adherent part with the conjunctiva at the limbus of the cornea. More often, however, the vascularity of the tissue lessens, its edges retract and it gradually disappears, leaving a smooth and not dense eschar.

Frequently no very firm attachment to the cornea occurs, and when the conjunctival flap retracts, the ulcer shows a clean healing surface which steadily progresses to complete recovery.

Should the stitches pull out too early, that is, before repair has well begun, then they must be replaced deeply in mucous membrane and the cornea kept covered until healing is well advanced. In rare instances it is necessary to resuture three or more times; not infrequently it must be done twice.

Subsequent treatment consists in keeping the eye closed by means of a bandage or adhesive strips, opening it only often enough to keep it cleansed of secretions. After the stitches

are loose and the cornea is uncovered, the use of atropin or other applications may of course be resumed, if desired.

Should a bridge such as mentioned form, it should be divided close to its corneal attachment as soon as the cornea has healed.

I believe this method of treatment to be applicable in nearly all forms of corneal ulceration. Even in infection of the cornea accompanying gonorrheal conjunctivitis, it can be used with great benefit; in fact, it is the only procedure I know of which holds out hope of preserving vision in grave cases. I do not mean, of course, that this can take the place of applications and other forms of treatment directed toward the control of the specific infection, but that coupled with this it gives most promise of preserving the cornea from destruction.

In gonorrheal infections great difficulty is encountered in covering the cornea and keeping it covered; the inflamed and thickened mucous membrane is inelastic and allows the stitches to cut through in a short time, so that it is necessary to do extensive dissecting and take deeper stitches and more of them than when dealing with normal conjunctiva, and the operation must usually be repeated, perhaps several times.

In the treatment of rodent ulcer, especially in elderly people, I have come to look upon this operation as a procedure which should be done at once—not as a last resort.

In treating indolent ulcers, or those in which there is much broken down material, I believe it is well to curette the ulcer; and, in any case, I usually instill a few drops of hydrogen dioxid just before covering the cornea, although the use of antiseptics at this time is, I think, of little importance.

Pannus is another condition in which this operation is of great value. In a case of pannus dependent upon and accompanied with trachoma, seen recently, the cornea was so completely covered with a dense, thick vascular growth, that light perception was barely present. This vascular growth was removed by carefully scraping with the edge of a cataract knife until clear cornea was visible, the troublesome hemorrhage meanwhile being controlled by applications of hydrogen dioxid. The cornea was then completely covered with conjunctiva firmly stitched in place. No other treatment was used, yet within a week the condition of the eye was vastly improved, and now, after two months, the lower two-thirds

of the cornea is quite free from pannus, with very slight cloudiness remaining, and the eye, which was blind, now has useful vision.

This operation is safe and simple, can usually be done under cocain anesthesia, and leaves less dense corneal opacities than those which follow the use of the actual cautery.

It is highly important, in fact it is essential to success, that the diseased cornea be kept covered with conjunctiva until healing is well advanced.

XX.

A CASE OF MACULAR HOLE.*

ALBERT C. SAUTTER, M. D.,

PHILADELPHIA.

The case exhibited this evening is that of a colored boy, eleven years of age, who was struck in his left eye with a potato about two years ago. The eye was considerably inflamed at that time, and for two weeks he was under the care of an oculist in Richmond, Va., whose name the patient is unable to recall.

In February, 1913, he was referred by a school doctor to the Eye Dispensary of the Germantown Hospital, service of Dr. William T. Shoemaker, for treatment of defective vision. Examination disclosed normal vision in the right eye, vision in the left eye being reduced to counting fingers at one and one-half meters, ophthalmoscopic examination revealing changes of sufficient interest to warrant presentation of the case before this section.

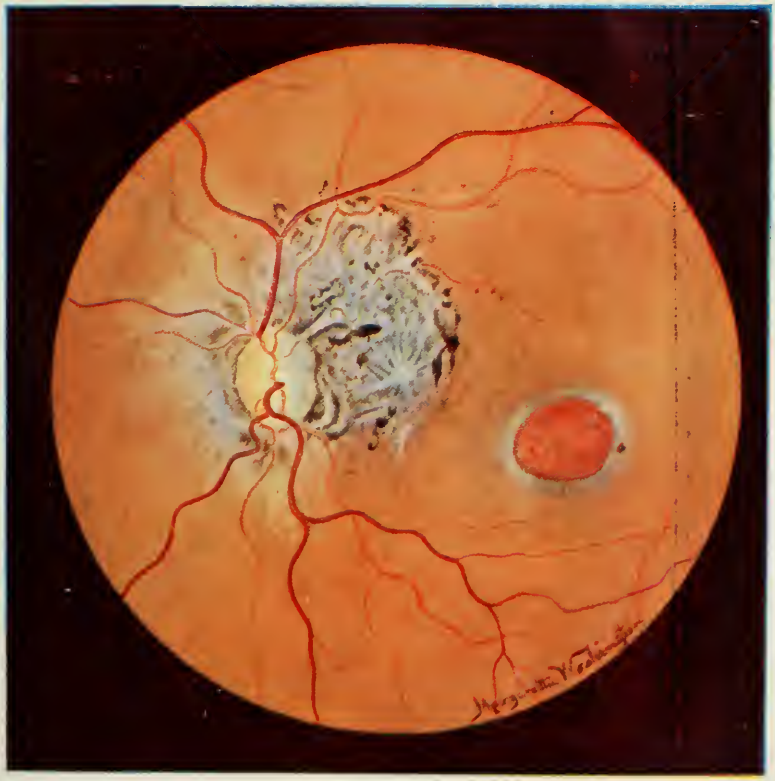
Examination in detail shows two linear scars in the glabellar region, a long scar along the left eyebrow, and another shorter scar below the left external canthus. There is no demonstrable evidence of a former fracture of the orbital rim. The patient attributes these scars to injuries received at various times; once to a dog bite, another time to being butted in the face by a playmate, and on another occasion to a brick which struck him in the face. These injuries, however, antedated the accident two years ago, resulting in visual impairment. Otherwise external ocular examination reveals nothing abnormal; the pupils are equal and react equally to light, accommodation and convergence.

Ophthalmoscopic examination of the right eye shows clear media and a normal condition of the fundus. In the left eye there is seen a small pigmented, floating vitreous opacity.

*Read before the Section on Ophthalmology of the College of Physicians, Philadelphia, April 17, 1913.

The disc is vertical oval, with well defined margins, and is distinctly atrophic in appearance, the temporal half being slightly excavated and the lamina almost entirely exposed. The nasal half of the nerve is of a pale rose tint. The arteries appear slightly reduced in size, but the veins are of normal caliber. A macular arterial branch shows in its proximal portion an envelope of connective tissue. Crossing the temporal edge of the disc are two extremely slender vessels, barely discernible, the lower one running obliquely downward and apparently joining a branch of the inferior temporal vein. Encircling the nerve head, but particularly extensive above and to the temporal side, is an irregularly outlined pigmented patch of old retinochoroiditis about three and one-half times the area of the disc.

In the macular region, separated from this patch by a stippled, moderately pigmented zone of retinal tissue, is a sharply circumscribed, somewhat depressed, dark red disc, pyriform in shape, with the rounded extremity situated temporally. This area is on a level with and just a little below that of the optic disc, the long axis of the oval being directed slightly down and in. In its widest part it is rather wider than the nerve head, but in length it does not quite equal that of the disc. This area has a more or less mottled appearance, contains some pigment and yellowish deposits, but no visible choroidal vessels. It is surrounded by a broad grayish white ring, with an inner shelving margin, especially well marked temporally, the nasal half of the ring being broader, with its inner edge sloping more gradually towards the excavation. Within this opaque band are a number of brilliant white specks and some spots of pigment. (The perimacular region, as portrayed in the water color sketch, is slightly incorrect; it should be more grayish white and broader in extent.) The adjoining retina exhibits many shifting reflexes. At the lower temporal border of the encircling gray zone there is a larger pigment clump, which aids materially in the demonstration of parallactic deviation, the refractive difference between the base of the excavation and the surrounding retinal tissue being about one diopter. This, in conjunction with the position and shape of the lesion, justifies a diagnosis of macular hole—one, however, of larger size than described in most of the previously reported cases.



Excepting a number of white specks resembling cholesterin crystals, observed here and there throughout the fundus, no other abnormalities are present.

Knapp in 1869 and Noyes in 1871 were the first to call attention to this anomaly of the fundus, but it was not until after Kuhnt's and Haab's studies in 1900 that references to macular hole became fairly numerous. While the majority of the cases reported followed a concussion injury of the eye, in a considerable number of cases traumatism could be positively excluded, the affection being then observed in association with various pathologic conditions of the eye, towit: ulcerative keratitis, uveitis, albuminuric retinitis, retinitis pigmentosa, senile changes and retinal vascular disease, as occurred in a case reported by de Schweinitz in 1904, and in one of Zentmayer's cases reported before this section in 1909. The lesion has also been observed to follow postoperative iridocyclitis.

No case has been studied ophthalmoscopically and then examined microscopically, if we exclude two rather atypical cases; one published by Parsons, of amaurotic family idiocy, and the other by Kipp and Alt, in which a true tear of the retina complicated with a rupture of the optic nerve occurred.

Cases of traumatic rupture of the retina differ clinically and anatomically from the typical macular hole, and both Coats and Fuchs emphasize the importance of differentiating between these two affections.

Pathologic studies have been made by Fuchs, Coats, v. Hippel, Murakami, Pagenstecher and others of eyes which would have presented the typical picture of macular hole had ophthalmoscopic examination been possible, these investigations including eyes with and without a previous history of traumatism. Histologic examination in these cases showed a cystic degeneration of the retinal layers, the formation of a hole at the macula resulting from rupture of the cyst walls.

Coats attributes this degeneration to an edema of the retina at the posterior pole; he believes a completely typical picture of macular hole necessitates a defect of all the retinal layers, but that the appearance of a hole may follow involvement of the inner layers alone.

Fuchs believes that the pathology is probably the same in most instances, whether due to traumatism, vascular or toxic

changes. There may be a primary fluid exudation, followed by a secondary pressure atrophy (albuminuric retinitis, neuritis), or a primary tissue atrophy followed by cavity formation (senile changes). In traumatic cases he considers edema probably the primary causative factor, although he concedes that a contusion might result in serious molecular changes, followed by death and absorption of the cells, without the occurrence of extravasations or lacunar degeneration.

In the case just reported the primary lesion was probably a commotio retinæ complicated with a traumatic neuro-retinochoroiditis, the ultimate result being a macular hole, localized retinochoroidal degeneration and optic atrophy.

In view of the general nerve atrophy present, we can only conjecture as to the relationship between the macular defect and the optic nerve atrophy.

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ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

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On the Use and Management of Self-lit Ophthalmoscopes.

ELLIOTT, LT. COL. R. H. (*The Ophthalmoscope*, March, 1913). The Morton-Marple electric ophthalmoscope has entirely replaced the reflecting ophthalmoscope at Madras. The essential features of this instrument are two: the U-shaped mirror, which gives no reflexes, and the arrangement whereby the distance of the source of light from the condensing lens (carried at the top of the tube of the instrument) can be altered in such a way as to provide a convergent, a parallel or a divergent beam of light. The advantage of this is that the whole fundus can be flooded with diffuse light, or a strong beam can be focused upon any required point.

The ophthalmoscopes are lighted either from a Pantostat, or from a combination of resistances, which enables any variation in the amount of light while the instrument is being used.

The mirror should have the glass of the sight hole cut away, rather than the silvering merely scraped off, so as to abolish the troublesome light reflex. The gap in the sight hole should be sufficiently large, preferably 1.33 mm. long and 4.5 mm. broad. W. R. P.

The Rational Surgery of Retrobulbar Neoplasms.

De Obarrio, P. (*The Ophthalmoscope*, March, 1913), considers the general extent, symptomatology and treatment of retrobulbar neoplasms, with a report of a case of cylindroma of the orbit.

The orbit contents are of such variety that there are but few tissues not represented. A rigid, conical shaped, bony container formed by seven cranial bones, lined by a continuous periosteum pierced by nine foramina or channels and lodging the lacrimal gland and adnexa, the ocular muscles, orbital fat, and cellular tissues, arteries, veins, nerves, lymphatics, a nerve of special sense, and the eye proper, any of which may give rise to neoplasms. In addition, we have metastases from other growths elsewhere, as well as invasions from adjacent cavities. It is easy, then, to foresee the great variety of simple tumors as well as the perplexing number of compound neoplasms that we may have to take into consideration in attempting a diagnosis.

General Symptoms.—1. Exophthalmus. It is difficult to conceive of the existence of a new growth, seated in the orbit, without the presence of this symptom to some extent.

2. Impaired function. Motility will be diminished in the direction of the seat of the growth. Acuity of vision will be reduced, depending upon the volume of the neoplasm and its location, the symptom being more pronounced the more posterior the situation.

3. Presence of visible or palpable tumefaction.

Exophthalmus may be divided into the following varieties: (a) Vertical, comprising upward and downward displacements. (b) Horizontal, comprising inward and outward displacements. (c) Diagonal, comprising four varieties, upward and inward, upward and outward, downward and inward, and downward and outward. (d) Directly forwards.

Following this classification, it is fair to assume, for instance, that a forward displacement of the eye, with a slight upward and outward deviation, is an indication of a tumor of the optic nerve. Likewise, a downward displacement would indicate the presence of a growth at the vault or adjacent tissues; an upward displacement would have a similar significance as regards the lower wall of the orbit. An oblique displacement downward and inwards would be suggestive of a new growth of the lacrimal gland or adjacent bony wall, whilst a displacement downward and outward would be strongly suggestive of frontal sinus involvement in the shape of exostosis; for instance, an outward displacement should call attention to an affection of the ethmoidal sinuses, and a similar reasoning should be properly applied to each one of the varieties enumerated above.

The means of investigation that we have at our command are the history of the case, inspection, palpation, percussion, transillumination, focal lighting, fluoroscopy and skiagraphy, which should always be employed whenever possible. Another very useful aid is the aspirating needle, where there is the slightest indication of the presence of fluid.

Treatment.—The surgical procedures are classified as follows: (a) Extirpation through soft parts with preservation of the eye. (b) Extirpation through a bony flap with conservation of the eye. (c) Extirpation with ocular enucleation. (d) Exenteration of the orbit which may be complete or subconjunctival or plastic.

Particular stress is laid upon the first method, extirpation through the soft parts, with preservation of the eye, which should obtain satisfactory results without resorting to more radical methods. However, thoroughness should not be sacrificed for conservatism.

The incision should preferably lie one or two centimeters from the orbital margin and parallel with it at the point of greatest protrusion, and comprise in one move the soft parts down to the bone. A careful dissection is necessary to a point of cleavage in all encapsulated tumors, and by following the same with a blunt instrument, extirpation will be greatly simplified. Inspection of the seat of the neoplasm by direct vision and digital palpation should be carefully made wherever practicable.

A case is reported of a large cylindroma of the orbit, which was operated upon without tenotomies, or bony resection, or

opening of the conjunctiva, with preservation of the eye in its entirety, together with all its functions. The patient, a male of Indian extraction, 20 years of age, showed a marked exophthalmus of the left eye with a decided deviation directly downwards in a vertical plane, to the extent of about three-quarters of an inch below the level of the right pupil, and a very small outward deviation as well. The upper lid was very prominent, but without any inflammatory appearances, and it had the consistency of a lymphoma. The lower lid, on the contrary, was very much crowded and wrinkled. The palpebral conjunctiva was normal. The bulbar conjunctiva presented marked engorgement of its vessels, principally the veins, due to the compression. There was no loss of sensibility in any part of the organ. The cornea, iris, lens, and vitreous were normal. The optic disc was hazy, and presented marked vasodilatation, such as might be expected from compression.

Vision, 20/40, with a very irregular astigmatism from his corneal opacity as well as from the change of form due to the compression. His sight was, however, most affected from the compression of the optic nerve. Motility: The eye was practically fixed in the orbit, permitting only very slight motion in every direction except upwards. Pupillary reaction to light, convergence, and accommodation was very sluggish.

On palpation the whole of the tumefaction of the upper lid was of an even consistency. A very small, hard, unyielding projection could be felt at the upper orbital margin lying within the orbit. There was no pulsation.

Under general anesthesia a large curved incision was made down to the bone parallel to the orbital margin, extending from the inner angle to the outer. A roughly oval shaped encapsulated tumor, almost as large as a hen's egg, lying horizontally from before backwards in the orbital vault, with the small end forwards, and four-fifths of its bulk posterior to the equator of the eyeball, was separated by blunt dissection from the muscles, periosteum and optic nerve and extracted in its entirety. Pathologic examination showed a mixed neoplasm having three distinct elements, to which the name was given "myxo-lymphango-endothelioma," which is a cylindroma. It resembled very much such mixed tumors as are observed in the parotid gland.

The patient made a good recovery. Functional examination,

thirty days later, was perfect with the exception of the vision, which was 20/50, owing to optic nerve condition. The motility, convergence, and esthetic result were unusually good. After a lapse of two years, there has been no recurrence.

W. R. P.

Aqueoplasty.

Zorab, Arthur (*The Ophthalmoscope,* April, 1913), offers the operation of aqueoplasty for the relief of increased intraocular tension, and describes it as follows: The anterior chamber is drained into the subconjunctival space by means of a silk thread. The site chosen is the upper part of the globe. A large conjunctival flap is first raised. An incision with a keratome is then made through the sclerotic into the anterior chamber. A bend of silk is passed into the chamber so that the loop lies anterior to the iris, the distal ends of the silk lying outside the globe on the exposed sclerotic. The flap of conjunctiva is then replaced and stitched in two places.

The operation may be performed in all cases where the intraocular tension is pathologically raised. If a permanent result is desired, the silk is left in. If a temporary result is aimed at, the conjunctival stitches are omitted at the operation.

An unhealthy state of the conjunctiva renders a successful result highly improbable. The operation itself offers no inherent difficulties. The silk is inserted through the sclerotic wound by means of a very fine pair of iris forceps from which the teeth have been removed.

The after-treatment consists of the instillation of eserin twice daily for two days, during which time the eye is kept bandaged. The conjunctival stitches are removed on the fifth or sixth day. The operation may be repeated.

Twenty-one eyes were operated in sixteen cases and the detailed report made. No tonometric readings were made.

W. R. P.

Contact Infection of Carcinoma of the Eye.

Givi, D. V. (*The Ophthalmoscope,* April, 1913), after mentioning the various theories of the etiology of carcinoma, states the most acceptable explanation of the occurrence of a new growth in one surface succeeding one on another surface is contact with it, and the tumor cell becoming implanted on the opposed surface, starts an independent growth. When the

opposed surfaces move on each other, the friction may give rise to an abrasion and favor the implantation. "Contact infection" is very rare. Two cases are reported from Professor Fuchs' clinic—one primary epibulbar, and one starting in the upper lid.

After a detailed history the author closes with the following remarks:

In Case I the tumor evidently started as an epibulbar carcinoma, and judging from its size and extent, must have been, owing to the negligence of the patient, allowed to continue its growth for a number of years, during which the lower lid obviously got implanted with the cells of the epibulbar tumor, which set up a new growth in it.

Case II appears to have been at the start one of carcinoma of the upper lid, leading later, from infection by contact, to a carcinoma of the margin of the lower lid and likewise of the cornea. The milder infiltration and the involvement of the glands in the lower lid, as compared with the upper lid, in which the downgrowths are dense and almost all the glandular structures have become carcinomatous, leads one to think that the lower lid was infected by the upper. The infection of the cornea occupies two separate areas—the upper and the lower third of the cornea—corresponding to the places of contact with the upper and lower lid respectively. The infection of the lower third of the cornea by the lower lid makes it probable that the affection of the lower lid was also of some considerable duration. What is very striking with regard to the tumor in the upper lid is that it involves almost every glandular structure and even a hair follicle. W. R. P.

A Case of Traumatic Multilocular Implantation Corneal Cyst.

Tirumurti, T. S. (*The Ophthalmoscope*, May, 1913). The case reported occurred in a Hindu girl, aged 10 years, who had sustained a finger nail injury to the cornea of the left eye three months previous. Examination showed a phthisis bulbi, on the outer half of which was a cyst-like vertically oval tumor. Anteriorly the eye was staphylomatous. The tumor was not movable over the sclerotic, appeared translucent, the upper part bluish, owing to the bulbar conjunctiva covering it. It measured 19x6 mm., extending downward almost to the inferior fornix. The eyeball was enucleated. Pathologic examination

showed the cornea converted into a multilocular cyst, the deeper cysts lined by several layers of endothelium resembling that of Descemet's membrane. Three small cysts and one large were present. No trace of lens was apparent and the retina was detached, separated from the choroid by a mass of colloidal exudate. The author was of the opinion that the injury to the cornea resulted in the escape of the aqueous humor, extrusion of the lens, and probably the escape of at least some of the vitreous humor. As a result of the sudden loss of support, the retina was detached all round and pressed the iris and the ciliary body forward "en masse." A portion of the endothelium of Descemet's membrane was evidently implanted between the corneal fibrous lamellæ through the rent in the posterior aspect of the cornea. This piece of implanted endothelium began to proliferate later, forming the main big cyst, which, as the result of great external resistance, sent prolongations between the interlamellar spaces behind to form smaller cysts, all of which communicate by narrow passages with each other.

W. R. P.

Pulsation of the Retinal Arteries.

Ballentyne, Arthur J., Glasgow (*The Ophthalmoscope*, May, 1913). The paper deals with the description and explanation of the various forms of retinal arterial pulsation and their clinical significance. The literature is reviewed in detail.

The pulsation seen in the retinal arteries is to be considered under four heads: (1) The locomotor pulse; (2) the expansile pulse; (3) the capillary pulse, sometimes found in association with those two and therefore described in this connection, and (4) the pressure pulse, collapsing pulse or intermittent inflow.

The locomotor pulse consists of a rhythmic displacement of the artery almost synchronous with the cardiac systole, and may be looked for in three different situations: (a) In the artery and its branches on the disc, (b) in the branches as they pass across the fundus, and (c) at points where bifurcation of a retinal artery occurs. Of these three forms of the locomotor pulse by far the most frequently observed is the second. In all three forms the movement consists of a sudden displacement, followed by a less sudden return to the original position. It agrees further with the radial and other arterial pulses in having an interval before each systolic beat corresponding to the long pause of the cardiac cycle. Intermission of the heart

beat is often manifested by intermission of the retinal pulse. The locomotor pulse is most readily seen in the curved portions of the arteries near the disc, and is synchronous with the radial pulse.

The expansile pulse is seen as a broadening of the blood column and of the central light streak. It is seen equally well in the straightest arteries, and is often found in the finer and straighter branches well out in the fundus. Sometimes the locomotor pulse alone is seen on and near the disc, and the expansile pulse alone in the periphery of the fundus.

Like the locomotor pulse, the expansile pulse shows a more sudden phase (expansion) followed by a less sudden contraction, and then a pause: three phases, corresponding respectively to the systole, diastole, and long pause, of the heart. Irregularities and intermissions of the heart's action are also reproduced in similar variations of the expansile pulse.

The capillary pulse, when present, is confined entirely to the disc. If the whole surface of the disc is of uniform tint, the pulse takes the form of a rhythmic deepening and lightening of the tint. If, on the other hand, the disc has one part more and another part less vascular, the pulse is seen as a rhythmic extension of the more vascular area, as one sees it under the nail, in the familiar clinical test. The flushing of the disc accompanies the cardiac systole, and blanching accompanies the diastole. The systolic phase is the more sudden, and the diastolic is followed by a pause. The capillary pulse seems to be absolutely synchronous with the arterial pulse and with the radial pulse.

The pressure pulse owes its name to the fact that it is brought about by high intraocular pressure, but the terms "collapsing pulse" and "intermittent inflow" have more descriptive value.

This phenomenon consists in alternate filling and emptying of the central ends of the branches of the central retinal artery, and it apparently never extends outside the limits of the disc. The filling is synchronous with the rise of the radial pulse, and the emptying with its fall, and the changes are so sudden that it is difficult or impossible to make out the direction of the blood stream as it enters or leaves the vessel. It presents the appearance of a column of blood flashing suddenly into and out of sight.

Thirty-six per cent of healthy persons show some form of arterial pulse in the retina, so that the arterial pulse is physiologic in the sense that it is a common occurrence in health.

In order that a pulse should be visible in any vessel, it is necessary (1) that the blood pressure in the vessel should be affected by the pulse wave, and (2) that this should cause a rhythmic expansion and contraction of the vessel, of sufficient amplitude to be visible. There are strong reasons for believing that the physiologic venous pulse is a pulse transmitted through the capillaries from the retinal arteries, and if we accept that view we must assume the existence of a pulse wave in the retinal arteries, but not necessarily one in which force and amplitude of the wave are great enough in relation to the rigidity of the vessel wall to produce a visible movement.

Two factors lie at the back of all these forms of the retinal arterial pulse: (1) the blood pressure in the retinal arteries, and (2) the intraocular pressure. While the ratio between the intraocular pressure and the mean blood pressure in the retinal arteries is fairly constant under physiologic conditions, the pulse pressure is not always constant. Pathologically, also, the pulse pressure may be greatly increased, while the mean blood pressure and intraocular pressure remain normal, as in aortic regurgitation, or the intraocular pressure may be greatly increased, while the blood pressure is normal, as in glaucoma.

The locomotor pulse consists of an expansion of the artery in the long axis, an elongation of the artery. If this occurs in a curved portion of an artery, the result is a displacement of the summit of the curve in the direction of the convexity, a movement much more readily seen than expansion and contraction in the caliber of the vessel. Raehlmann holds that the locomotor pulse is more dependent on rhythmic acceleration of the blood stream. Both factors are probably effective, as the same conditions of the circulation are favorable to both, the pulse pressure varying directly with the acceleration of blood flow produced by each pulse wave. The tendency of sudden acceleration of the blood stream is to straighten out the vessel, while in the more commonly observed form of locomotor pulse, there occurs an exaggeration of the curves, which can only be due to the elongation of the vessel which results from the systolic rise of blood pressure.

In view of the uncertain results of pressure experiments in the human eye, and the absence of clinical evidences of variation of the locomotor pulse in cases with marked variations of the intraocular tension, it must be admitted that there is no obvious relationship between the locomotor pulse and the pathologic changes in intraocular pressure. The locomotor pulse as a pathologic phenomenon appears to depend almost wholly on an abnormality of the form of the pulse wave which enters the retinal artery.

The expansile pulse is an expression of systolic and diastolic rise and flow of blood pressure in the retinal arteries. As regards the influence of the intraocular pressure as expansile pulse, even normally it tends to favor the appearance of the pulse: (1) by impeding the outflow of blood from the veins, (2) by the support it gives to the walls of the arteries themselves. The intraocular pressure is a necessary factor in the occurrence of the expansile pulse, even when it is normal. The elevation of the intraocular pressure is capable of producing expansile pulse in the retinal arteries of healthy eyes, but it is equally true that the expansile pulse is as commonly observed, and in the most striking form occurs in cases where the ocular tension bears a normal relation to mean blood pressure, in which there is an abnormally large interval between systolic and diastolic blood pressure. This is the outstanding factor in the mechanism of the expansile pulse in the retinal arteries. Therefore, in explaining the expansile pulse, the relation between three things must be considered, namely, intraocular pressure and systolic and diastolic pressure of the retinal arteries. It may be assumed, however, that within certain limits intraocular pressure varies along with the mean blood pressure, and will have a fairly constant relation to the pressure in the retinal arteries and veins, and intraocular pressure must be lower than diastolic pressure with the finger to cause intermittent emptying of the ends of the arteries, and it must be only a little lower than blood pressure in the retinal veins, since very slight pressure with the finger is required to empty the vein ends. A certain increase of intraocular pressure by the finger will in favorable cases produce expansile pulsation of the retinal arteries, while a still greater pressure will produce the collapsing pulse, which corresponds to the point of maximum oscillation of the vessel wall, indicating that intraocular pressure is

then equal to the diastolic pressure in the retinal arteries. In any normal individual the intraocular pressure is so much below diastolic pressure of the artery that the oscillation of the wall is slight and invisible. When any change occurs by which the intraocular pressure is approximated to the diastolic pressure in the artery, the relation of extra- and endovascular pressure will be such as to cause a distinct oscillation of the arterial wall. This state of affairs may be brought about in the eye, either (1) by raising intraocular pressure to meet the diastolic endovascular pressure, or (2) by bringing down the diastolic pressure to meet the intraocular pressure. The first case represents the state of affairs in glaucoma, in which the intraocular pressure rises independently of retinal blood pressure until it may readily reach a point near to the diastolic pressure in the artery. It is also the condition produced temporarily by pressure with the finger just short of that needed to produce the collapsing pulse. It can be readily understood that in either of these cases if the "pulse pressure" in the central artery is small, even such an approximation of the pressures may be unable to elicit a visible expansile pulse. This will explain why the expansile pulse is seldom seen in glaucoma, and not easy to observe in the finger pressure experiment. Since intraocular pressure bears a fairly constant ratio to the mean arterial pressure, then if the former remains normal the approximation of intraocular pressure and diastolic pressure in the artery will necessitate an increase of pulse pressure, that is, an increase of the interval between systolic and diastolic pressure in the artery. It will be observed that this is what occurs in cases where the expansile pulse is most typically seen, namely, in cases of aortic regurgitation in which a pulse wave is found even in the finest divisions of the arteries. The two conditions which must be fulfilled for the production of the expansile pulse are (a) extravascular pressure nearly equal to diastolic endovascular pressure, and (b) a high range of pressure inside the artery. W. R. P.

(To be concluded.)

Anisometropia.

McMullen, Halliburton W. (*Ophthal. Rev.*, December, 1912). When a person's eyes are unequal in refractive power, the prescription of glasses that can be worn with comfort may

be very difficult. As a rule, the most troublesome cases to treat are those in which the difference between the two eyes is of moderate degree and the faculty of binocular vision well developed. Probably one of the chief causes is the artificial heterophoria produced by the unequal prismatic effects of the lenses when the visual axes do not pass through their optical centers. The difference in prismatic effects of the lenses varies as the eyes are turned to look in different directions, causing continual changes in the degree and kind of heterophoria produced, and calling for corresponding changes in the muscular adjustments required to correct it.

Correcting lenses cause changes in size of the retinal images, unless their optical centers coincide with the anterior focal points of the eyes. There can be little doubt that the discomfort caused by wearing unequal glasses is due, in part, to the resulting inequality in size of the retinal images.

Further difficulty in fusion of the images may be the result of differences in the amount of the optical aberrations produced by the unequal lenses, causing slight differences in form and definition of the images, especially when the visual axes pass obliquely through the glasses.

Another possible, but probably not very potent, cause of discomfort is inequality in the effects of accommodation on the two sides.

It is a physical impossibility to make a pair of unequal spectacle lenses which will not produce to some extent the optical effects enumerated as possible causes of discomfort. In many cases, however, discomfort can be prevented or minimized by attention to certain details.

Every case must be judged on its own merits. If even the smallest power of binocular vision be present, it may be necessary to correct both eyes to give relief from symptoms of eye strain, although the difference between the eyes be very great.

When both eyes are ametropic, the visual acuity of both good, and binocular vision well developed, glasses correcting both eyes should always be given. If they cause discomfort, two pairs, very carefully centered for distance and reading, should be given, and the patient advised to persevere in their use for several weeks at least. If, in spite of careful adjustment of glasses and several weeks' trial, the discomfort persists, it will be necessary to leave one eye under-corrected.

When both eyes are ametropic, and binocular vision is defective, it is best in the majority of cases to correct both eyes, unless the visual acuity of one eye is so bad that the development of binocular vision is out of the question. In children, of course, there is much more chance than in adults of developing the visual acuity when defective, and there are few cases in which the correction of both eyes can be regarded as obviously useless.

If one eye is emmetropic, or nearly so, it may be difficult to decide whether glasses should be prescribed or not. In the case of children one has to consider whether the development of binocular vision will be an advantage sufficiently great to outweigh the disadvantage of wearing glasses continually, bearing in mind that in some occupations the wearing of glasses is a serious handicap to progress. In older patients one's decision will be influenced chiefly by the presence or absence of symptoms of eye strain. N. M. B.

Subjective Color Sensations in Retinitis Pigmentosa.

Fergus, A. Freeland (*Ophth. Rev.*, January, 1913), reports a case of retinitis pigmentosa of twenty years' standing; patient has been unable to read or write for twelve years, in which peculiar color sensations were noticed within the last two months. Fergus explains the sensations as indications of the last stage of retinal destruction. N. M. B.

A Case of Temporary Total Blindness of the Left Eye Due to Pressure of Cystic Distension of the Left Maxillary Antrum on the Optic Nerve—Rapid Recovery of Sight After Operation.

Pooley, G. H., and Wilkenson, G. (*Ophth. Rev.*, May, 1913). The case is reported in full. The history and prognosis of eye symptoms by Pooley. The nasal examination with diagnosis, histologic appearance, etc., by Wilkenson.

Remarks.—The case may be summed up as being one of pressure on the optic nerve, due to displacement upwards into the orbit of the upper wall of the antrum, from pressure of a cyst within it. That it was purely a case of pressure is shown by the rapid recovery of vision when the pressure was relieved by puncture of the cyst. The patient's account of her loss of vision, viz., that it was as though a curtain had been slowly drawn from below upwards in front of the eye, points to pro-

gressive pressure on the nerve, acting from above downwards. This may be explained by supposing the displacement upwards of the orbital floor to have stretched the nerve upwards over the somewhat sharp upper edge of the orbital foramen, which caused a loss of conductivity of the nerve from above downwards.

Though antral polypi, and pressure on the optic nerve from accessory sinus distention are both fairly common conditions, we have been unable to find any recorded case similar to the one above described. It is unusual for antral polypi to cause distention, and it is very unusual for the antrum, when distended, to exert injurious pressure on the nerve. The unusual anatomic features of the case are: (1) complete closure of the antral ostium. Had the ostium been patent, the cystic polypus would have made its way into the back of the nose, in the form of the choanal cystic polypus familiar to rhinologists. (2) Comparative thickness of the outer and nasal walls of the antrum. When distended the antrum usually bulges outwards, towards the buccal aspect, and inwards towards the middle meatus of the nose. The comparative dullness of the left antrum to transillumination no doubt shows that the outer antral wall on the left side happened to be thicker than that on the right. An antrum distended by a clear cyst is usually more than normally translucent. The dullness in this case must have been due to extra density of the bony walls. The bony walls yielded at the thinnest part, viz., the posterior half of the floor of the orbit, which was raised so much as to press directly on the optic nerve. The rapid recovery of the nerve when pressure on it was relieved by drawing off the fluid, suggests that the bone in the distended area was much thinned or even completely absorbed. The evenness of the distention would seem to preclude the presence of a congenital dehiscence in the bone, such as is described by Onodi as occurring in this situation.

The cyst is of the type commonly found growing from the lining of the antrum, i. e., a degeneration cyst formed within a mucous polypus. Such degeneration cysts occur, of course, commonly as in ordinary nasal polypi, but the fact that almost all large polypi of the antrum become transformed into thin-walled cysts seems to require some explanation. It may be that the poorer vascular supply of the antral as compared with the nasal mucous membrane favors degenerative changes

in polypi growing from the former. The degenerative process is comparatively far more frequent in antral, than in ordinary nasal polypi. By some pathologists antral cysts are regarded as retention cysts occurring through "dilatation of the excretory duct of a mucous gland." That the cyst present in this case is not of this nature seems clear, from comparison with the minute polypus growing in close proximity to it, which already shows a small space within it, a commencing degeneration cyst.

The literature of optic neuritis secondary to accessory sinus disease has already attained a formidable bulk, but it concerns itself mostly with inflammatory conditions of the sinuses, especially the sphenoidal and posterior ethmoidal. On the one hand uncomplicated disease of the maxillary sinus of any kind rarely affects the nerve, and, on the other, purely pressure effects from noninflammatory distention of any of the sinuses are rare. N. M. B.

The Relation of the Nasolacrimal Canal to the Maxillary Antrum —Formation of the Lacrimal Recess.

Whitnall, S. T. (*Ophth. Rev.*, February, 1913). Swerchewsky writes that the antrum has an outgrowth in relation to the nasolacrimal duct often containing chronic granulations which can be of great influence in diseases of the canal.

In an examination of twenty-one maxillæ, five were found with a lacrimal recess separated off from the rest of the antrum by a constricted neck and in size about as large as a pea or the tip of the little finger, the constricted entrance to which is bounded by the infraorbital canal, the anterior superior dental canal, the nasolacrimal canal, and the floor of the orbit.

N. M. B.

A Case of Glaucoma.

Henderson, E. E. (*Ophth. Rev.*, January, 1913). A case of glaucoma is described in which both eyes were operated on, one by the ordinary iridectomy method and the other by the trephine, with loss of vision in the former and return of vision to normal in latter. N. M. B.

The Shape of the Orbit: Its Influence Upon the Eyeball.

Whitnall, S. E. (*Ophth. Rev.*, February, 1913). Stilling (1888) stated that shortsightedness was commonly associated

with a low orbital aperture, the suggested explanation being that in such microsemic skulls the superior oblique muscle was placed at a lower level than normal, and by compressing the eyeball could cause it to become elongated in an antero-posterior direction with consequent myopia.

A point which appears to have been overlooked and which is also detrimental to Stilling's theory is that the position of the pulley (trochlea) of the superior oblique muscle, that is, the point from which the action of the muscle in compressing the globe would originate, is not necessarily correlated to either the height or shape or index of the orbital base.

Measurements show that the distance between the origins of the oblique muscles (taking the trochlea as being the place from which the action of the superior oblique originates) of the globe is less variable than either the orbital height at the margin or within the cavity, and that the size of the orbit cannot affect the shape of the eyeball through the agency of the superior oblique muscle. N. M. B.

Crater-like Hole in the Disc Associated With Changes at the Macula.

James, R. R. (*Ophth. Rec.*, February, 1913), reports a case of one of the rarest ophthalmic pictures; that of crater-like hole in the disc in a child six years old. About twenty similar cases have been reported, but none with associated macular changes. N. M. B.

A Case of Paresis of the Fourth Nerve Following Herpes Zoster Ophthalmicus, Complicated by a Preexisting Heterophoria.

Traquair, H. M. (*Ophth. Rec.*, March, 1913), states that herpes of the fifth nerve may be followed by various ocular complications, of which lesions of the motor nerves of the eye are among the more uncommon. The most frequently affected nerve is the third in one or more of its branches, then the sixth, while the fourth is only very exceptionally involved. He reports a case in detail with reference to cases reported in literature. N. M. B.

Another Glaucoma Operation.

Smith David Priestly (*Ophth. Rec.*, March, 1913), describes another operation which is little more than a combination of several well known procedures, the objects being iridec-

tomy and fistulization of the anterior chamber. It consists of Elliot's conjunctivocorneal flap, and, instead of a trephine hole, a keratome incision notched on its anterior lip. The article is well illustrated. N. M. B.

Should a Man With Miner's Nystagmus Work?

Riseley, Stanley (*Lancet*, March 1, 1913). The subject is discussed with relation to the Workman's Compensation Act. The conclusions are that when a man claims to be and is admitted to be incapacitated by nystagmus, after a reasonable period during which he has been under constant observation, if his condition warrants his being employed, he should eventually resume work under ground, but as a commencement occupation above ground should be provided. For, as I have shown, there is no doubt that a man with bad nystagmus can work and do good work, and is no worse for doing it; and certainly the attitude of the medical profession toward the disease—viz., that as soon as a man was diagnosed to have nystagmus he should not be allowed to work in the pit, and should be advised never to return—has been responsible in great measure for the present state of affairs. Seeing, however, that many of us brought in contact with the disease now know that the willing men can work with nystagmus, and are doing so, I should like to plead that a different attitude be taken up, and instead of immediately looking upon a man with nystagmus as totally incapacitated, we should, with the exception of serious cases, urge the claimant to continue work, knowing that he can do so without injury to himself.

As a result of the use of a new miner's electric safety lamp which gives an illumination of about 1.5 candle power, the management of a colliery where they are being tried out expect cases of nystagmus to become much less frequent.

N. M. B.

Ocular Myoclonus.

Thomson, E. (*Lancet*, January 18, 1913). The descriptive title is chosen by the author, as he does not wish to place it too definitely in any particular pigeonhole of the cabinet of "tics." Its precise place may perhaps be found by the neurologist, to whom the facts may prove to be of use as a contribution to the elucidation of nervous disease.

Patient, male, 18 years, a printer; had as long as he could remember been subject to attacks of closing of the left eye, associated with headache and sickness. The present attack was one of the worst he had ever had; had lasted a week.

The left palpebral fissure looks smaller than the right, owing to a permanent slight droop of the upper lid. There are rhythmic contractions of the left orbicularis palpebrarum and occipitofrontalis muscles; the rate is 72 per minute. The orbicularis does not contract sufficiently actually to close the eye, but the upper lid comes down to approximately the half pupil, and the lower lid is drawn upwards, more particularly at its nasal end. The combination of elevation of the skin of the forehead with contraction of the orbicularis gives rise to a very curious facial appearance. Every now and then (i. e., at the first consultation, at which date only was the spasm truly rhythmic) the spasm ceases to be rhythmic and becomes irregular. There is no movement of the muscles about the nose or mouth, and the patient states that there never have been movements of this sort of any other muscles. He states that he has never had double vision. When the patient is not actively accommodating and when the light is not too bright, it is obvious that both pupils contract and dilate in association with the orbicularis-occipitofrontalis contraction and relaxation. It is specially noted that the hippus is not in the nature of a light reflex due to partial covering of the left pupil. If that were the case pupil dilatation would correspond with orbicularis contraction, whereas the pupils contract simultaneously with the orbicularis, and dilate immediately the contraction of that muscle ceases. Ophthalmoscopically there is no indication of spasm of the ciliary muscle. The refraction is emmetropic in the right eye and hypermetropic about 4 D. in the left eye. (V., R., 5/5; V., L., 5/36. No improvement with glasses.) Fundi normal.

On the first examination only, when the spasm was at its highest degree, never on any subsequent occasion, although carefully looked for, there was seen a slight rapid lateral nystagmic movement of the right optic disc. It was not observed in the left eye. It occurred coincidently with the orbicular spasm.

Subsequent observation has shown that bromid only lessens the intensity and abolishes the rhythmicality of the spasm. The contractions go on from day to day and week to week, sometimes more and sometimes less troublesome to the patient.

It seems more easy to correlate the lid closure reflex and the facts of the present case in accordance with the theory of Mendel, that the third nerve center supplies innervation normally to the orbicularis and occipitofrontalis muscles. According to this hypothesis, it is merely necessary to suppose that the cells for pupil contraction and for orbicularis movements lie near together, may act normally together, and may easily be influenced by the same stimuli. Harman has brought forward evidence of a morphologic nature to oppose the theory of Mendel. Nevertheless, the present case forms a contribution to the subject which seems rather to support that hypothesis.

N. M. B.

On the Duty of the Practitioner in Cases of Ophthalmia Neonatorum.

Stephenson, Sydney (*Lancet,* November 16, 1912). The method of inoculation is gone into thoroughly; the rest of the paper dealing with the subject under three heads: prevention, notification, and treatment. N. M. B.

The Treatment of Unilateral Cataract.

Parsons, J. Herbert (*Lancet,* November 9, 1912). By "unilateral cataract" I mean cases of cataract in which only one eye is affected, or in which the other eye, if not absolutely normal, has sufficient vision to enable the patient to carry out his ordinary duties. The cases are best divided into two great groups, according to the age of the patient, for, speaking generally, the indication is to operate in cases of unilateral cataract in the young and not to operate in the adult or aged.

Let us first consider the main advantages which may be expected to accrue to the patient from successful operation. Perhaps the greatest, for reasons which will be apparent from the sequel, is restoration of the full field of vision. Next as regards central vision. If the patient had originally little or no error of refraction, he will with the aid of a strong convex lens have his central vision restored. This might, a priori, be regarded as a much greater asset than mere improvement of the field of vision. In reality it is not so. Hence, it is not to be anticipated that after the operation the patient will be able to wear a cataract glass. The affected eye will, therefore, be practically useless, for central vision, and no particular gain accrues in this respect.

Next to be considered is the cosmetic effect. It will naturally be assessed at a different value by different individuals. The pupil of an eye with a mature or hypermature cataract is white and unsightly, at once attracting attention to the deformity. Hence, though of no very high order morally, the cosmetic effect of the restoration of a black pupil must be taken into account as a material advantage of operation in these cases.

The types of cataract which have to be dealt with are two—congenital or early infantile, and traumatic. Congenital and early infantile (lamellar) cataracts are only occasionally unilateral. Patients with unilateral cataract, in which the whole of the normal pupillary area is occupied by the opaque lens, often tend to develop a squint. In children it is usually convergent. In them it probably does not depend fundamentally upon the cataract. Probably in the cases in which squint develops there has been an inherent tendency to squint—perhaps only an otherwise latent strabismus. The defective vision in the affected eye decides the manifestation of the squint and the eye which shall take up the abnormal position. In adults the tendency is for the affected eye to become divergent as a rule. Now the improvement of central vision by operation, even though the refraction be not corrected, often suffices to prevent the development of the squint, and is the more potent the earlier the operation is performed.

Besides the disadvantage of the development of squint in the young, in many cases the cataract will become hypermature if left alone. It will then be much less amenable to operation, which will be attended with greater difficulties and dangers. Some congenital and lamellar cataracts are slowly progressive, and though the indications for operation may not at first be imperative, they become so later.

For these reasons, therefore, it is generally advisable to operate upon unilateral cataract in the young, and it remains to discuss the operation of choice. Almost invariably it is discission.

My experience, especially as a pathologist, has taught me that the few cases of needling which go wrong do so as the result of the curette evacuation. It is excessively rare for an ordinary needling to become infected or otherwise give rise to anxiety. I therefore advocate repeated needlings in these cases, using every precaution to avoid the necessity of evacu-

ating the contents of the anterior chamber through excessive swelling of the lens matter and consequent increased intraocular tension. The only objection to this method is that it takes a longer time than the bolder line of action, but time is usually of little importance in young children, compared with increased safety.

Occasionally one meets with a unilateral congenital nuclear cataract in a child. When the pupil is dilated a broad rim of clear lens is seen around the opacity, and vision is improved. In these cases the question of an optical iridectomy arises instead of discission. If successful it will have all the advantages of discission, and will in addition preserve such accommodation as the deformed lens is capable of, while preventing the operative anisometropia. The cases which are suitable for optical iridectomy are very few. In the first place, it is essential to be sure that the cataract is not progressive.

After twenty to thirty years of age, one is liable to have grave difficulty with the nucleus of the lens, if discission is employed. Hence, the problem of the treatment of unilateral cataract assumes an entirely different aspect. A severer method of treatment, attended with greater difficulties and dangers, both immediate and remote, has to be faced. The cataracts which come under consideration are senile, traumatic, and complicated.

The senile cataracts are usually those in which one eye is much in advance of the other, though the latter is affected also in some degree, and will almost certainly progress. The general considerations already detailed lead me not to operate in these cases unless the field of vision is of prime importance to the patient (vide supra), or the appearance of the eye prevents the patient from earning his living. On the technical side there is one potent indication for operation, and that is the appearance of signs of hypermaturity. The thickening of the capsule which attends this process, and other changes occurring in the lens substance which cannot now be enumerated, add so much to the dangers and difficulties of extraction, that they justify early interference.

In traumatic cataract there is often injury to other parts of the eye, and each case must be considered on its merits. By "complicated" cataract I mean opacity of the lens which has arisen without obvious cause, or in which there is some general

disease, such as diabetes, or some local disease to which the cataract is secondary, such as iridocyclitis. It is very rarely justifiable to operate on these cases; hence, it is of the utmost importance that the urine should be examined in every case and a careful search made with the corneal loupe for keratitic precipitates ("k. p.") on the back of the cornea. "K. p." is an absolute contraindication to interference. N. M. B.

A Case of Enlargement of the Eyeball.

Hird, R. B. (*Ophth. Rev.*, May, 1913). At first sight this case looked like infantile glaucoma, and I investigated it carefully with a view to that diagnosis. The outward appearance was suggestive, but in the absence of raised tension, cupping of the disc, and bad vision, I was forced to put that diagnosis on one side. In infantile glaucoma, too, the lens is small in proportion to the globe, but I found no evidence of this in my case. Now, after nine months, I still find things as they were. The condition has not progressed, and no other signs of infantile glaucoma have arrived.

Fuchs states in his textbook that infantile glaucoma may come to a standstill, and of course this case of mine may be an abortive one.

I must admit that it appears to me a case of simple hypertrophy of the globe, and it is this that prompts me to publish the case. I shall certainly keep the boy under observation.

N. M. B.

A Case of Traumatic Posterior Lenticonus.

Fisher, J. H. (*Ophth. Rev.*, April, 1913). A case is reported in detail and is interpreted as follows: The case appears to be that the concussion injury had caused a minute rupture of the capsule of the lens at its posterior pole. This was so minute that at first it caused no alteration in the curvature of the lens, but it had the effect of abolishing or at least of reducing its power of increasing in convexity when the ciliary muscles were thrown into action. Gradually, a small hernia of the lens substance through the rupture produced the posterior lenticonus, so that in eleven months the striking change recorded in the refraction developed and the posterior lenticonus, which I recognized fifteen months after the accident, explained this phenomenon.

The iris and lens were never tremulous. The slowness of the change is what may be expected in a patient of forty years of age with a very small rupture of the lens capsule posteriorly. Hernia of the somewhat solid lens material towards the vitreous might be expected to be slow: still slower would be the development of an intracapsular opacity under these circumstances.

I regret that an examination for deformity of the reflex images given by the posterior surface of the lens was not made in this instance, and to this extent the diagnosis between true and false posterior lenticonus was not established. The appearances, however, were carefully scrutinized with a dilated pupil, and I have not the slightest doubt that the explanation I have offered of my case is the correct one. The sequel of events is, to my mind, sufficient to establish its accuracy, and if it be admitted as a case of true posterior lenticonus, it appears to be the first on record as an acquired condition.

Reference is made to the very complete collection of reported cases by Madame Dr. Gourfein-Welt in the *Archives d'Ophtalmologie*, Vol. XXXI, p. 625, which contains a complete bibliography and a review of the various explanations which have been offered for the development of posterior lenticonus.

N. M. B.

The Importance of Examining the Feces and Urine in Eye Diseases.

Browning, S. H. (*Ophth. Rev.*, April, 1913). A strong plea is made for the examination of the excreta of the alimentary and genitourinary tracts in those ocular conditions whose etiology is not immediately obvious.

Pyorrhea alveolaris, or Rigg's disease, has at last been given the attention that it needs, but even the cure of the pyorrhea does not clear up the general infection of the alimentary tract that results from many years of pus swallowing, and patients with comparatively clean mouths come to be treated for chronic iridocyclitis with no obvious cause, though an examination of their feces would have revealed the fact that they were abnormal and that the patient was suffering from a streptococcal, pneumococcal or other bacterial infection of the bowel.

But apart from infection by swallowed pus, the patient may have a colitis, with or without knowing it, and its correlation with the eye disease is very often unappreciated. I have now had several cases of iridocyclitis sent to me for a diagnosis

from whom I have obtained a history of colitis, and who have been cured both of the colitis and the eye complaint by vaccine and other treatment.

There are, however, some cases from whom no history of colitis can be obtained, though the patient is probably constipated, and it is in these patients that one is likely to miss the real cause of the disease. I now examine the feces and urine of all patients sent to me who are suffering from chronic iridocyclitis of obscure origin, as well as other forms of inflammatory eye conditions.

The routine carried out is then described and treatment by autogenous vaccines is suggested.

At present iridocyclitis seems to be the most common eye disease caused by infection of the alimentary or genitourinary tracts, though keratitis, retinitis and retinochoroiditis have been met with.

The proof that the eye condition is caused by the intestinal or urinary infection is the cure of the eye disease at the same time as the other more general condition. This can be most readily brought about by the use of a suitable autogenous vaccine.

I have made no mention of gonorrheal iritis, as the urine, as a rule, is of no help in this disease. Vaccine treatment is of great help in alleviating the immediate acute symptoms, but of itself will rarely effect a permanent cure. The prostate is often infected with gonococci in these cases, and the urine passed after prostatic massage will often show the gonococcus in the threads, though attempts at cultivation very often fail. An examination of the prostate ought to accompany all efforts in the treatment of obstinate recurring gonorrheal iritis.

N. M. B.

The Control of the Eye in Cataract Operation.

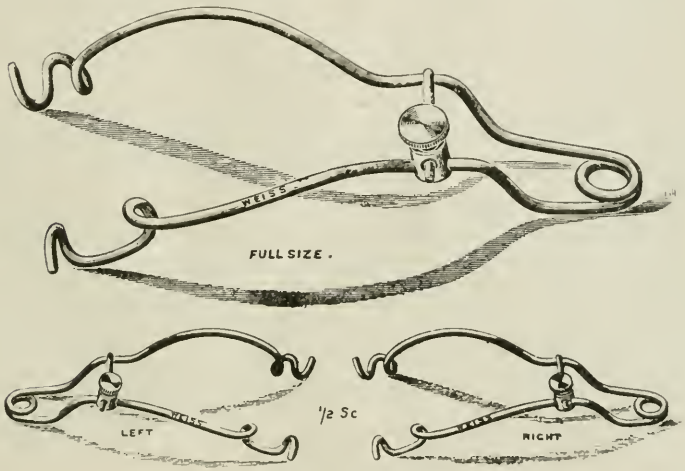
SUMNER, F. W. (*Ophth. Rev.*, April, 1913). A compliment is paid to Col. Smith for his work in removal of the lens in its capsules.

There is, however, too great a tendency for the Smith school of operation to band themselves together in a mutual admiration society and say, "Oh, yes, you imagine you do Smith's operation, but you cannot do it properly if you have not seen him do it and done it under his supervision."

It is to help the poor unfortunates who are not in this happy band, to say nothing of those who are, that this article is written.

The one and often insuperable difficulty in removing a lens in its capsule according to Smith's method is the necessity there is to have at hand a skilled assistant to take charge of the eyelids in order to prevent the patient making use of his orbicularis palpebræ muscle and thus exerting pressure on the globe and squeezing out vitreous.

Not only does the assistant take charge of the patient's eyelids, but he also takes charge of the operator's reputation, for



Sumner's Cataract Speculum, made by Messrs. Weiss, London.

the least flaw in correctly holding the eye may have disastrous consequences.

Driven by these disadvantages I have evolved a means of control of the eyelids requiring no skilled assistance and making it impossible for the most nervous patient either to move his head or squeeze his eyelids.

The handle of the speculum has a curve to accommodate the index finger: the ball of the thumb rests on the spring: the portion of the upper blade which slips under the eyelid is narrower and projects under the lid much further than in the orthodox speculum.

For the corneal incision it is introduced and used as an ordinary speculum, except that the outer edge of the upper eyelid must be held back with a blunt hook to prevent the possibility of the knife touching and being fouled by it.

A different speculum is required for each eye, and a smaller speculum for use with very small or children's eyes. They are all of the same pattern.

The assistant now holds the speculum between the index finger and thumb, taking a firm grasp of it: the other fingers lie against the side of the face: pressure of the thumb on the spring end of the speculum, acting through the index finger as a fulcrum, tilts up the eyelids to whatever extent is necessary.

The assistant's other hand is spread out over the patient's head and, the eyebrow having been well drawn back, his thumb presses against the upper edge of the orbit.

By flexing or extending the wrist the upper blade may be made to slide under whatever portion of the upper lid most exposure is necessary, according to the direction the patient rolls his eye.

By pronating or supinating the forearm the correct amount of "lift" of the eyelids off the eyeball can be obtained; the correct amount of the upper lid is enough room to clearly see the fornix where the patient may not roll his cornea out of sight: the lower lid is to be held just off the eyeball: with a bad squeezer the lids should be held well off the eye.

The assistant stands at the side, resting his elbows on the pillow on which the patient's head lies: there is no strain in the position of his body, arms or hands.

The operator stands at the top of the table bending over the patient's eye: the patient's head should lie on a very flat pillow and the top of his head be flush with the top end of the table.

When the speculum is introduced the best amount of separation of the blades (and of course of the lids) is found by raising the lids off the eye and then screwing down the pin to fix them: this amount of separation is generally less than the possible amount of separation of the blades when resting on the eye, the eyelids not being raised. N. M. B.

A Sclerocorneal Trephine.

Pusey, Brown (*Journal A. M. A.*, May 17, 1913), has devised a trephine with a barrel of even diameter for 0.75 mm.

from the cutting edge, then a slight flare, the object being to avoid the danger of cutting too deeply and also to avoid the interference of the turned-over conjunctival flap. E. S. T.

An Eye Lesion Following Two Intravenous Injections of Salvarsan, but Relieved by Its Further Use.

Levis, Harold J. (*Journal A. M. A.*, May 3, 1913). This very interesting case had a severe retinitis in one eye following two injections of salvarsan; a third injection caused marked improvement of the vision, and each succeeding injection caused further improvement. The vision fell to 3/100, but after the final injection was 15/20. Nine injections in all were given. E. S. T.

Burn of Eyeball Due to Caustic Contents of Golf Ball.

Crigler, L. W. (*Journal A. M. A.*, April 26, 1913), reports the case of a boy who, while cutting open a golf ball, received a spurt of fluid contents in the right eye, causing a severe burn of the conjunctiva and the cornea. An analysis of the paste in the center of a golf ball said to be of similar make to the one causing the accident, showed that it consisted of a mixture of barium sulphate, soap and a free alkali (sodium hydroxid, 2.4 per cent). (A number of such cases have more recently been reported, and many golf clubs now have notices posted in the club house, warning players of the danger of dissecting golf balls.—T.). E. S. T.

New Iris Scissors.

Frisch, Frederick (*Journal A. M. A.*, April 19, 1913) has devised an instrument in which the handles are bent back beyond the position of a right angle to the blades, the idea being that the bend may rest upon the patient's forehead in what he considers a more natural position. E. S. T.

Saving the Backward School Child.

Gould, George M. (*Journal A. M. A.*, April 5, 1913). This paper is a repetition of Dr. Gould's assertion, so often put forward, that errors of refraction in school children lead not only to retardation of mental development, but to serious moral defects. He quotes in detail the examination of forty school children by Dr. W. M. Richards, and mentions that Dr. Rich-

ards estimates that there are 78,000 children with defective vision in the public schools of New York. To those who have followed Dr. Gould's writings, this method of reasoning will be quite familiar, and it is unnecessary to go into the details of the paper. E. S. T.

Treatment of Acute Dacryocystitis.

Verhoeff, F. H. (*Journal A. M. A.*, March 18, 1913), calls attention to Agnew's method of treatment in this disease, which was first suggested forty years ago, but which he has used for three years without being aware of Agnew's views on the subject. The ordinary treatment of the condition is based on the ordinary assumption that a lacrimal abscess is analogous to an ordinary abscess. This, however, is not the case. In the earliest stage of an ordinary abscess the central cavity is lacking, and while the abscess cavity is forming a reaction is taking place around it which walls it off and tends to prevent extension of the infection to the surrounding tissues. In the case of a lacrimal abscess, on the other hand, there is a preformed cavity which is already walled off from the surrounding parts by connective tissue. As the inflammation increases the infection penetrates the wall and forms one or more secondary abscesses in the tissues without. It is obvious, therefore, that the lacrimal abscess should be opened immediately. The author uses a small angular keratome which is made to enter the sac by an incision just in front of the caruncle, the lacrimal duct is then probed through the incision, using as high as a Theobald No. 16, if possible. Probing is continued through the incision until the inflammation subsides; no irrigation is used. It is not always necessary to slit up the canaliculi. E. S. T.

An Argyll-Robertson Pupil Becoming Normal After Mercury and Salvarsan.

Zaun, J. J. (*Journal A. M. A.*, March 1, 1913), reports the case of a man, aged 32, whom he first saw in July, 1912. There were some general symptoms of tabes and a well-marked Argyll-Robertson pupil, with no specific history, but a positive Wassermann reaction. Mercurial inunctions and potassium iodid was given until August 20th, when an injection of salvarsan was given, which was followed by another November 4th. When seen in December, both pupils reacted promptly to light and the general symptoms had much improved. E. S. T.

Trachoma: Its Prophylaxis and Therapy.

HARRISON, W. H. (*Journal A. M. A.*, February 22, 1913), writes on the basis of his experience among the Indians west of the Mississippi. He is convinced that it is a communicable disease, little or not at all influenced in its course, complications, sequelæ and termination by natural factors of latitude, longitude, altitude, heat, cold, moisture or dryness. It has been thoroughly demonstrated, in his experience, that when the proper subsequent treatment is applied, all cases of trachoma improve much more rapidly after expression. He has in many instances used expression on one eye, comparing result of the unoperated with the operated eye. He uses expression in late cases, even in those in which there is little or no trachomatous material to be removed, and thinks the good effect is caused by the increased and quickened blood and lymph supply resulting from the expression. He uses hot applications after the expression, followed by instillations of argyrol. He considers that the expression of the granules is merely a therapeutic beginning in the production of this artificially produced hyperemia, and that the treatment must be continued for weeks or even months afterwards. This treatment consists mainly of applications of copper sulphate stick, which he considers the most effective treatment. E. S. T.

Tumors of the Orbit—A Plea for Operation.

COLLINS, SIR WILLIAM (*British Medical Journal*, February 22, 1913), reports five cases on which he operated, four of sarcoma and one a venous cavernous angioma. One of the sarcoma cases recurred rapidly and died. The other three have gone for two years, five years, and seven years, respectively, without return. E. S. T.

Aches and Pains Connected With the Eye and Nose.

SHAW, CECIL E. (*British Medical Journal*, February 22, 1913). This rather unusual article attempts to classify pain in relation to its clinical causation. Pain in the eye is often due to a foreign body. Sharp neuralgic pain, coming on at night, points to chronic iritis. Acute iritis gives severe pain of the neuralgic character, as also does acute glaucoma. Pain as a manifestation of gout appears usually at night, with con-

siderable scleral congestion. Inflammation of the sphenoid sinus gives a severe bursting pain, generally described as in the middle of the head, sometimes shooting up to the ears. Vague neuralgic pains may come from malignant disease. Headaches may be caused by enlargement of the turbinate bones, chronic suppuration in the accessory sinuses, tumors of the brain or astigmatism. E. S. T.

Hematoma of the Left Orbit Treated by Modified Kroenlein Operation.

Cotterill, J. M., and Mackay, George (*British Medical Journal*, February 22, 1913). The patient, a man of 38, was struck in the eye, four years previously, by the head of a horse as the animal suddenly turned towards him Some months later he noticed that when he stooped forward at his work the left eye protruded. This condition increased until the vision became severely affected. A Krönlein operation was done, the orbital margins of the bone being divided by a fine saw and chisel. Just inside the periosteum, at the back of the orbital cavity, a mass was felt which proved to be a hematoma. A tablespoonful of clot was removed. Recovery was complete with only slight diplopia on looking to his extreme left.

E. S. T.

The Influence of Septic Infection in the Causation of Eye Disease.

Lang, B. T. (*British Medical Journal*, February 22, 1913), treats mainly of the cases of scleritis, keratitis and uveitis in which the cause is obscure, but due to septic focus in some other part of the body. Septic foci occur in three situations: 1. Along the respiratoalimentary tract. 2. Along the genito-urinary tract. 3. On the skin or in a sinus leading from it.

Under the first heading he reports a woman, aged 45, with chronic cyclitis, who recovered rapidly after a chronically inflamed lacrimal sac was removed. A similar case, in a woman with a chronic suppuration of the antrum of Highmore; another case that recovered after the cure of a chronic suppurative otitis. Chronic gingivitis is the commonest of all causes. It is not necessary for a tooth to be loose or for the socket to emit pus on pressure. Slight marginal inflammation around the necks of a few teeth is all that is required. Of the 176 cases under review, buccal sepsis was traced as the cause in 71.

Chronic tonsillitis, tubercle of the lung, chronic gastritis, typhoid fever, chronic appendicitis, sprue, chronic mucous colitis, dysentery and chronic constipation, are mentioned as causes.

Under the second heading is mentioned: Bacterial infection of the urine, urethritis, uterine polypus, and uterovaginal discharge.

Under the third heading a case of iritis is reported in which a varicose ulcer was supposed to be the cause; another case of cyclitis in which a purulent sinus existed in the navel.

The paper is based upon the analysis of 176 cases, and the author feels that these eye conditions are often septic in origin and not due to anemia, idiopathic tendencies, rheumatism, or the gouty diathesis. E. S. T.

Extraordinary Alterations in the Corneal Epithelium of a Glaucomatous Eye.

Alt, Adolph (*Amer. Jour. of Ophthal.*, February, 1913), describes the unusual conditions found in the cornea of an eye which was enucleated for glaucoma. No other history was obtained. A milky looking thickening was noticeable on the surface of the cornea in the upper half, looking like pannus. In the lower half the surface of the cornea was irregular. On section, the thickening was seen to be interposed between Bowman's membrane and the epithelium, and was composed of connective tissue and blood vessels. In the lower half of the eye, the conjunctiva which remained was infiltrated with leucocytes, and near the periphery the corneal epithelium was slightly lifted up from Bowman's membrane in several minute places by small amounts of round cells and a very thin layer of connective tissue. Two vesicles were found near the center, bounded in front by the corneal epithelium and behind by Bowman's membrane. The whole process is regarded as a formation of corneal vesicles, followed by a peculiar cicatrization. E. C. E.

Keratoconus and Ectopia Lentis.

Shoemaker, J. T. (*Amer. Jour. of Ophthal.*, February, 1913), reports a case in which both of these conditions existed in each eye. In spite of the handicap, the patient earned her living as a stenographer. E. C. E.

Remarks on Holes in the Macula Lutea and Fovea Centralis, With the Report of a New Case.

Alt, Adolf, St. Louis (*Amer. Jour. of Ophthal.*, Vol. XXX, No. 4, April, 1913), reviews the history of this condition, first described by Herman Knapp in 1869 (*Archives of Ophthalmology*, Vol. I, p. 177), and of which a considerable number of cases have been since recorded. The first case in which the condition was seen with the ophthalmoscope, and subsequently verified by microscopic examination, was seen by Kipp and Alt (*Am. Jour. of Ophthal.*, Vol. XXVI, p. 225).

Fuchs mentions as causes for this hole formation: 1. Spontaneous inflammation of the whole eye without perforation, like iridochoroiditis, or the retina alone, like albuminuric retinitis and neuroretinitis. 2. Disturbance in the nutrition of the retina as in pigmentary retinitis, in familial amaurotic idiocy, in arteriosclerosis, or after the use of X-rays. 3. Detachment of the retina. 4. Perforation with subsequent inflammation through an injury, operation (discission, cataract extraction), or a corneal ulcer. 5. Contusion without perforation. This is the most frequent cause of hole formation. 6. In some cases the cause remained unexplained. In old people senile changes might be thought of. To these Alt adds: 7. An intraocular tumor (his second case).

Coats' opinion is quoted, as follows: "Macular holes are produced by an edema of the retina at the posterior pole. The edema may not be confined to the region of the fovea, but the appearance of a hole will only be produced if there is a defect at least of the inner layers of the retina. Possibly for the completely typical picture without membranes or shreds, a total defect of all the layers of the retina is necessary. The edema may result from a contusion, in which case it is the same as the edema which produces Berlin's opacity; or it may arise from toxins in the vitreous, the result of iridocyclitis; or from retinal vascular disease."

Alt reports a case following an injury from explosion of a dynamite cap, with foreign body. The eye was enucleated two weeks after the accident. On section there was found a localized swelling of the macular region, due to edema of this part of the retina. The condition is minutely described and well illustrated.

The edema having caused an amount of pressure and conse-

quent destruction of the tissue elements which they could no longer withstand, had finally suddenly burst through an opening into the inner layers and the inner limiting membrane, and the current of the liberated fluid had drawn nuclei and fibers in its course inward towards the vitreous chamber. That the hole is not clean cut, as it appears in older cases, is, of course, perfectly natural, as the partly destroyed parts have not yet been shed and absorbed, nor has there been time for the formation of the scar tissue.

Just outside of the macula the retina assumes its normal appearance: even the rods and cones show no pronounced pathologic changes. This is the case in the direction of the optic papilla, as well as in the direction toward the periphery of the retina.

It seems from this specimen, which evidently represents a very early stage of the formation of a hole in the fovea centralis, that a high degree of hyperemia of the choroid may, with the aid of some mechanical or chemical influences, lead to a localized edema in the macula lutea and its nearest surroundings, which, if it persists long enough, may lead to a rupture of the inner layers and the inner limiting membrane, and thus may cause the formation of a hole. It may seem doubtful that such a process alone would account for as large a macular hole as Pagenstecher and Genth, Kipp and myself and Coats have found, although there is nothing to prevent a small hole in the fovea centralis from growing into a larger one in time. E. C. E.

The Report of a Case of Sympathetic Ophthalmia, Developing Seven Days After Operation, Treated by Neosalvarsan—Recovery.

Calhoun, F. Phinizy, Atlanta (*Amer. Jour. of Ophthal.*, Vol. XXX, No. 4, April, 1913), reports the case of a boy, aged 21, with occluded and secluded pupil, iris bombé, and reduced tension in the left eye of four years' duration. Vision in right eye normal, and the eye normal except for a small atrophic spot of choroiditis between the macula and papilla. An iridectomy was attempted, but not satisfactorily made, on account of the dense adhesions and an unruly patient. Seven days later sympathetic disturbance in the right eye. The left eye was enucleated and the patient put to bed and given atropin and hot applications, dionin, and internally salicylates, mer-

cury, iodids and hexamethylenamine, without checking the disease. Wassermann negative. Neosalvarsan .7 gram was given nine days after the enucleation. For four days the eye grew worse, then slowly better. Three months after the iridectomy the patient was dismissed with vision 20/40 E. C. E.

On Tuberculosis of the Eyelid.

Friedenwald, Harry, Baltimore (*Amer. Jour. of Ophthal.*, Vol. XXX, No. 3, March, 1913), quotes from Michel (Graefe-Saemisch's Handbuch, Vol. V, pt. 2, p. 94) the following division of skin tuberculosis: 1. Lupus (presenting yellowish gray or brownish red nodules from the size of a pin head to a hempseed). 2. Scrofuloderma (in which the lesion usually begins in the lymph glands or lymph vessels, i. e., "cold abscess"). 3. True tuberculous ulcer (the miliary tuberculosis of the skin). 4. Tuberculous warts, and 5. Tuberculous fistula.

Tuberculous ulceration of the skin is rarely primary, and the following description of tuberculosis of the eyelid is also quoted from Michel: "There are at first slightly raised tubercles or milium-like formations, which rapidly break down and become ulcerative, at which time they are easily mistaken for chalazion. The floor of the superficial ulcer is coated with soft yellowish red granulations, the margins are sharply cut, jagged, very congested and but slightly infiltrated. In the immediate neighborhood fresh tubercles may develop. . . . The margin of the lid is the part most liable to the affection, especially the median portion of the lower lid. The destructive process along the margin of the lid may become very extensive. The disease may spread to the conjunctiva, but it rarely spreads far over the surface of the lid. . . . It may spread to the opposite part of the other lid. The preauricular glands become somewhat enlarged." Two cases are reported, both successfully treated by the X-ray.

E. C. E.

Hyalitis Caused by (a) Pus Absorption and (b) Intestinal Autointoxication.

Charles, J. W., St. Louis (*Amer. Jour. of Ophthal.*, Vol. XXX, No. 3, March, 1913), reports two cases. One of them has been reported by McCubbin and Gundlach (*Am. Jour. Ophthal.*, May, 1912) as "A Case of Optic Papilloedema and

Paresis of the Third Nerve Caused by Inflammation of the Ethmoidal Sinuses." The patient had had frontal headache for seven years without apparent eye or sinus trouble. Six months later she showed left internal ophthalmoplegia and blurring of the disc margins, with slight impairment of vision and elevation of temperature. The anterior and posterior ethmoidal cells, with the frontal and sphenoidal sinuses, were widely opened, with relief to the headaches and restoration of vision for one and a half years, when there was again slight fever with hyalitis, punctations on Descemet's membrane, and blurring of the nasal margins of the disc in the right eye. From this condition she spontaneously recovered in four months.

The second case was that of a man, 41 years old, with failing vision in the right eye and muddy vitreous. Treatment was of no effect in changing the ocular condition. A thorough general examination resulted in a diagnosis of catarrhal bronchitis, gastritis hyperacida and general autointoxication. Wassermann negative. Von Pirquet "practically negative."

E. C. E.

Pseudoglioma in Children.

Krauss, Frederick, Philadelphia (*Ophthalmology*, Vol. IX, No. 3, April, 1913), reports the case of a boy, aged 8, with one defective eye which gave a greenish yellow pupillary reflex following a slight inflammatory attack. Tension was reduced. The enucleated eye presented retinal detachment, subretinal exudate and hemorrhage. The diagnosis between pseudoglioma or plastic iridochoroiditis, retinitis proliferans and glioma is discussed.

Retinitis proliferans consists of masses of fibrous tissue in the vitreous, vascularized by blood vessels from the retina. The masses are generally found in the neighborhood of the disc, and the presence of some dyscrasia is usually necessary to stimulate organization.

Pseudoglioma is a form of iridochoroiditis which stops short of suppuration and the exudate organizes, forming what is known as a cyclitic membrane behind the lens.

The writer thinks his case belongs to a distinct class of diseases of the retina occurring in children, characterized by retinal detachment, hemorrhages and cellular exudate in the anterior part of the ball. E. C. E.

Simplification of the Operation of Kroenlein.

Magitot, A., and Landrieu, M., Paris (*Ophthalmology*, Vol. IX, No. 3, April, 1913). There are two ways in which the orbit may be reached: the anterior route, and the temporal route. The anterior route may be followed either by (a) the transpalpebral route, dividing vertically the two eyelids, or by dividing transversely the base of one or other lid, or by (b) the transconjunctival route, by separating the eyelids, dividing the conjunctiva and entering the orbit along the nasal or temporal side of the ball, with or without temporary tenotomy of a muscle, or by (c) the transpalpebroconjunctival route, by dividing the external commissure and conjunctiva and entering the orbit after temporary tenotomy of the externus. The temporal route involves resection of the bony temporomalar wall, and is known as Krönlein's operation. Its advantages are that it gives free access to the orbit without injury to the visual function and with a minimum of deformity. The operation is described in five principal stages: 1. Incision of the soft parts. 2. Detachment of the external part of the orbital periosteum. 3. Resection of the bone. 4. Turning out of the flap. 5. Replacement of the flap.

The modification is in the third step, resection of the bone. In order that the bony block removed shall reach as deep as the pterygomaxillary fissure, it is necessary that the first section shall start from this fissure, passing from the depths to the surface. Every method which begins by cutting the orbital border fails to reach the fissure. In order to do this a wire saw is passed through the fissure. After incising the periosteum along the temporal edge of the orbit, the periosteum is detached as far as the pterygomaxillary fissure. The temporal aponeurosis is then incised and the muscle displaced without detaching the exterior periosteum of the bony flap, as it is through this membrane that the replaced flap is to be nourished. A flexible conductor, with the wire saw attached, is passed through the fissure till its point is seen in the orbit, when it is grasped with forceps and drawn through, bringing the saw after it. The technical difficulties of this procedure are such as to necessitate practice of it on the cadaver. The section of bone is now made with the saw cutting forward, and this cut is the lower outline of the flap. The upper incision in the bone is then marked with a guarded saw and

completed with a chisel. The bony block is thus liberated without splintering and can be readily displaced and replaced.

E. C. E.

Wolfe Graft Used to Correct a Total Ectropion of the Upper Eyelid.

Goodenow, N. H., Everett (*Ophthalmology*, April, 1913, Vol. IX). What is known as the Wolfe graft was originated by a surgeon of Glasgow, and consists of transferring a detached section of the full thickness of the skin, from the arm or other suitable locality, and placing it over a freshly denuded area, securing it by sutures, or, if the coaptation is perfect, no sutures may be necessary.

In the technic of the Wolfe graft there are two points to be kept in mind, failure to observe one or both of which will be sure to result in disappointment. They are, first, fresh and thorough denudation of the area to be covered. Second, a liberal allowance made in the size of graft transferred as compared to size of defect. It is also equally important that the tissues should have a good blood supply, and should be free from granulation tissues or infection. The eyelids offer the most favorable conditions for the successful use of the Wolfe graft, as the blood supply is exceptionally good, and the tissues are less susceptible to infection than the tissues of other parts.

In reference to restoration of function, the operator must be sure that all bands of adhesions drawing the eyelid or other structure away from its normal position are fully released; the eyelid then placed in a position of extreme overcorrection and firmly secured by suture or other means, the resulting gap filled in by Thiersch or Wolfe grafts, or both. When healing has progressed satisfactorily, usually at the end of a week, the eyelid may be released, when it will take its normal position, where it will stay, unless there is again contraction of the scar tissue. This will be avoided if the surgeon has observed the three points mentioned above: First, to free all adhesions; second, to place lid in extreme overcorrection and keeping it there; third, to be liberal in the use of grafts used in filling in the defects.

The case reported is that of a man, aged 47, whose upper lid was destroyed by a caustic paste. Two operations with Thiersch grafts failed to relieve the condition. A Wolfe graft

from the arm 4½x1½ inches in size was then transplanted to the freshened area left by freely dissecting loose the lid, with excellent results. E. C. E.

Altitudinal Hemianopsia, Unilateral and Bilateral—Reports of Cases.

Peter, Luther C. (*Ophthalmology*, Vol. IX, No. 3, April, 1913), refers to a case of double inferior hemiopia, reported by Uhthoff, and thought to be caused by symmetrical disease of the optic nerves, as the only binocular case of altitudinal hemiopia in literature. Unilateral cases are reported by Russell (basilar bone tumor), Sailer (rheumatic retrobulbar neuritis), and Krause (ethmoidal disease). The author adds one unilateral and one bilateral case. The first case was due to local disease—embolism of the inferior retinal arteries—and the macular region was not involved.

The second patient, a woman, aged 41, had a paralysis of the left external rectus muscle in December, 1905, which disappeared under the use of mercury. In April, 1906, a supposedly lentic affection of the nose developed. In September, 1907, she found that her vision was affected in the upper half of the field of each eye. Central vision was 20/30, without scotomata, but with a defect including most of the upper half of the field in each eye. In 1908 central scotomata were present. In 1912 this defect persisted, with general contraction of the remaining halves of the fields, with pallor of the lower halves of the nerves and slight contraction of the arteries. There was slight difficulty of speech and occasional mental confusion. Wassermann not taken. History negative. Treatment had not been followed out by the patient. The lesion was thought to be a gumma of the inferior part of the chiasm. E. C. E.

Report of a Case of Mumps With Interesting Ocular Complications.

Worthington, Major H., Chicago (*Ophthalmology*, Vol. IX, No. 3, April, 1913), quotes from Woodward the following reported ocular complications of mumps: Twenty-three cases of neuroretinitis. Vision more or less impaired in twelve, recovery in eleven. Three cases of retrobulbar neuroretinitis, with complete recovery. Six cases of optic nerve atrophy, with blindness in four, nearly complete blindness in two.

Keratitis complicated with iritis in one eye. Made imperfect recovery. Six cases of iritis. Three complete recovery, three imperfect recovery. Fourteen cases of dacryoadenitis. Three cases each of paralysis of accommodation and of extraocular muscles.

To these he adds a case of interstitial keratitis in a man, aged 23, occurring just at the end of a severe double parotitis complicated with orchitis. One eye only was affected. Recovery was perfect in a week, under atropin, dionin and hot applications. E. C. E.

The Large Incision in Cataract Extraction.

Snydacker, E. F. (*Ophthalmology*, Vol. IX, No. 3, April, 1913), advocates a large (at least three-fifths of the circumference) corneal incision as giving exit to the lens with less trauma, and leaving less cortical débris. E. C. E.

Lacrimation.

Bradburne, A. A., Manchester (*Ophthalmology*, Vol. IX, No. 3, April, 1913). Abnormality in the amount of tears present in the conjunctival sac may be the result of oversecretion, that is, lacrimation, or to an obstruction in the channels of outflow, that is, epiphora.

The normal secretion of tears is the function of the lacrimal gland, and it possesses a peculiar interest in that it can be the outcome of either a psychical or a physical stimulus.

The psychical stimulus is considered by some to be a function of the optic thalamus, and if this be so it would seem to support the old theory of the thalamus being the organ which controls emotional expression, as is seen in forced laughter or forced crying (Dana). In connection with this it is of interest to remember that the newborn cannot shed tears, and the reason according to some is that the cerebral tracts are not fully developed at birth, but the real cause is more probably due to the absence of adenoid tissue in the lacrimal gland, which is wanting at birth.

The physical stimulus, though not definitely decided, is held to be due to excitolacrimal fibers derived from the seventh or facial nerve.

The secretion of tears is also influenced by the sympathetic nerve through its effects on the blood supply to the gland.

When the production of tears is excessive, it is the result of exaggeration of a reflex the nature of which must be sought in the extensive nervous anastomosis with which the lacrimal nerve has relationship.

When, however, the production of tears is normal in amount, its retention in the conjunctival sac must be due to interference with its outflow.

When the lacrimal canals are closed by swelling of the mucous membrane or by small plugs of epithelium or mucus, it may be necessary to gently wash out the ducts.

Epiphora unrelieved by such treatment may be the result of nasal deformities or disease, hypertrophic rhinitis, atrophic rhinitis, syphilitic and tubercular diseases being not uncommon causes. According to the author, probes should never be employed. E. C. E.

Clinical and Experimental Researches on Intraocular Drainage.

Schoenberg, M. J., New York (*Archives of Ophthalmology*, March, 1913), asks the question: What is the normal rate of drainage of intraocular fluids in animal and human eyes, and how is the rate of drainage affected in human eyes?

He calls attention to the well known fact that when the Schiötz tonometer is continuously applied on the eye a certain length of time the tension gradually decreases, which means that a certain amount of fluid has been expressed from the eye.

He defines the index of ocular drainage as the rate or rapidity with which the ocular fluid may be expressed by the weight of the tonometer applied on the eye.

The intraocular pressure may be low in a certain eye, and yet the drainage capacity may be impaired and the elucidation of this fact may clear up the diagnosis in doubtful cases of incipient glaucoma.

Investigation by this method of the eyes of two rabbits and three patients with optic atrophy, showed that the index of drainage is not the same in every patient or in the same eye at different periods.

Investigation of a number of eyes in varying stages of glaucoma showed an impairment of function. In patients with a tension within normal limits and yet a condition of latent glaucoma, the diagnosis may apparently be cleared up to a certain extent. G. S. D.

Unusual Duration of Mental Symptoms in a Case of Atropin Poisoning.

Burr, Charles W., Philadelphia (*Archives of Ophthalmology*, March, 1913), reports a case of unusually severe and protracted hallucinations following the use of atropin. Duration six weeks. G. S. D.

Report of a Case of Conical Cornea Successfully Treated by the Actual Cautery.

Posey, Wm. Campbell, Philadelphia (*Archives of Ophthalmology*, March, 1913), reports a case with vision of 3/100 (not improved) in the left eye where he cauterized a triangular area comprising about one-sixth of the cornea, beginning at the cone and having its base about 2 mm. from the temporal limbus. The severity of the cauterization was increased from the apex to the base, which was thoroughly burnt. Resulting vision, 5/22, and with correction, 5/7½.

Posey believes that success from cauterization lies in replacing the greater part of the cone with a firm scar, dense enough to prevent the penetration of light. Prompt vascularization of the cauterized area is most desirable; thus, following Elschnig's advice, it should be carried almost to the limbus. Graduated cauterization should be practiced, light at the apex of the cone and deep at the base. Subsequent tattooing is optional. Iridectomy as a rule is unnecessary. G. S. D.

The Effect of Chronic Glaucoma on the Central Retinal Vessels.

Verhoeff, F. H., Boston (*Archives of Ophthalmology*, March, 1913), in a valuable communication, reports the pathologic findings in thirty-nine cases of secondary glaucoma. In every case one or both of the central vessels were affected with endovasculitis in the region of the lamina cribrosa. In general the vein was the more affected. Retinal hemorrhages were present in only three cases, each showing complete obstruction of the central vein. In four cases expulsive subchoroidal hemorrhage, spontaneous in three. Age apparently was not of great importance in the production of the lesions found. The writer discusses the causation of these changes, and regards the direct action of the increased intraocular pressure as the most important factor in their production. Just how it acts is, however, not clear. He does not, however, regard

these changes as important in producing loss of vision. He concludes that secondary glaucoma always produces an endovasculitis of the central vessels leading to complete obstruction. Changes are the same as seen in primary obstruction. Thrombosis does not occur. Dissecting aneurisms occur. Obstruction of the central vein in secondary glaucoma seldom if ever produces the intense primary retinitis seen in the primary form. In chronic primary glaucoma, endovasculitis of the central vessels, where not coincidental, is the result, not the cause, of the increased intraocular pressure. G. S. D.

The Optic Disc in Purulent Otitic Disease and Its Complications.

Gruening, E., New York (*Archives of Ophthalmology*, March, 1913). Changes in the appearance of the optic discs occur in purulent middle ear disease and its complications, but its occurrence is too little noted at the present day. Gruening points out the possible value of a greater degree of swelling on one side than on the other as indicating the site of the otitic lesion. He endorses Schieck's theory of the genesis of choked disc. G. S. D.

The Rods as Color-Perceptive Organs.

Siven, V. O., Helsingfors (*Archives of Ophthalmology*, March, 1913), believes that the rods possess color-perceptive functions, and cites many arguments and observations to prove the fact. His paper does not lend itself to an abstract and should be read in the original. G. S. D.

The Use of Vaccines in Eye Infections.

Dwyer, James G., New York (*Archives of Ophthalmology*, May, 1913), lauds the use of vaccines in infections of the eye. Of twenty-seven cases of recurrent hordeola, twenty-four were cured by autogenous vaccines in an average of seven to eight doses, beginning with 100 million and increasing up to 1000 million. He has had similar success with other infectious processes due to the tubercle bacillus, gonococcus, pneumococcus, streptococcus, staphylococcus, Friedländer's bacillus, Morax-Axenfeld, xerosis, micrococcus catarrhalis. (Unfortunately other observers have not met with a similar degree of success.) G. S. D.

Herpes Iris of the Conjunctiva.

Barkan, Hans, San Francisco (*Archives of Ophthalmology*, May, 1913). There are twenty reported cases of this disease. Barkan describes one observed in Fuchs' clinic. His first attack occurred in March, 1911, in Berlin. Seen in Vienna in June, 1912, having suffered since the first attack with photophobia and conjunctivitis. He had a high temperature and at times was semicomatose. Hemorrhagic blebs on the skin, ulcerated areas of the mouth, and a bloody urethral discharge. The eyes showed a severe conjunctivitis of the diphtheritic type, and later a superficial ulceration of both corneæ and numerous symblephara. There was a constant discharge of great quantities of thick, grayish yellow secretion. Vision reduced in the better eye to fingers at 5 mm.

There is also a mild form of herpes iris which shows itself as a catarrhal conjunctivitis and ends in complete recovery; a severe form, to which the above case belongs, and a malignant form which sometimes ends in death. However, involvement of the eye in herpes iris is a rarity. G. S. D.

Another View of the Extraction in the Capsule Cataract Operation.

Meding, C. B., New York (*Archives of Ophthalmology*, May, 1913), went to Amritsar to learn this operation under the tuition of Colonel Smith. He has returned an enthusiast for it. G. S. D.

Protection of the Eyes of School Children.

Black, N. M., and Vaughn, F. A. (*Ophthalmic Record*, February, 1913). The writers believe that by proper cooperation the eyesight of school children may be protected and preserved. The printing and paper of school books should be improved, and the illumination, both by day light and artificial light, should be bettered. Samples of various tones of paper are submitted and discussed, the question of type and spacing is taken up, and the subject considered from many angles.

G. S. D.

The Treatment of Pulsating Exophthalmos With Case Report.

Buchtel, F. C., Denver (*Ophthalmic Record*, February, 1913), reports a case of pulsating exophthalmos in a boy, treated by distal ligation of the orbital veins, with an apparent

cure at the end of three months. He believes that this operation should replace ligation of the carotid, as it is very simple, the mortality should be almost nil, and the percentage of success appears to be great. G. S. D.

Hole at the Macula.

Clapp, C. A., Baltimore (*Ophthalmic Record*, February, 1913). The case showed an oval excavation near the macula in each eye with a "punctate" condition of the retinal periphery O. D. and marked pigmentary changes in the retinal periphery O. S. The etiology and literature of this condition are considered. G. S. D.

U-Shaped Hemostatic Lid Clamp.

Stevenson, Mark D., Akron (*Ophthalmic Record*, February, 1913). Described by the title. G. S. D.

Infectious Suppurative Keratitis.

La Mothe, E. A., Chicago (*Ophthalmic Record*, March, 1913), in an exhaustive paper, considers the various types of infectious suppurative keratitis and discusses the bacteriology and mechanism of their production. The process of repair, the symptomatology and the treatment are taken up. The article furnishes a good discussion of the modern views of these infections. G. S. D.

Dystrophia Epithelialis Corneae.

Reese, R. G., New York (*Ophthalmic Record*, March, 1913), reports a case of this disease occurring in a woman aged 74. Previous history negative. Progressive impairment of vision for four years. V., R., 10/200; L., 15/200. Diffuse, irregular grayish opacities in both corneæ. Minute vesicles of uniform size. Epithelium wrinkled over the opacity. Hyperesthesia. No improvement after four months' treatment. He alludes to another case seen five years previously. A consideration of the disease follows. G. S. D.

A Practical Electric Perimeter.

Black, N. M., Milwaukee (*Ophthalmic Record*, March, 1913). The advantages of using electricity in perimetry are emphasized. The intensity of illumination may be kept the same or increased or diminished at will. Absolute spectral col-

ors may be used. The advantages of taking a field in the dark are dwelt upon. Black has fitted an electrical attachment to the McHardy perimeter. G. S. D.

A Case of Cerebellopontine Tumor Diagnosed and Located Three Years Before Death.

Veasey, C. A., Spokane (*Ophthalmic Record,* March, 1913). The patient, a woman, 49 years old, complained of headaches, deafness, tinnitus, nausea and vomiting, attacks of dizziness, loss of strength, inability to walk well; double optic neuritis, paresis of right external rectus, marked nystagmus, especially on rotating eyes to extreme left. Fields moderately contracted. Right-sided facial paresis. Paresis of fifth nerve on right side. The patient died three years later, and the autopsy showed a tumor somewhat larger than an English walnut in the right cerebellopontine angle, which proved to be an endothelioma.

G. S. D.

The Needs of Eye, Ear, Nose and Throat Hospitals.

Allport, Frank. Chicago (*Ophthalmic Record,* April, 1913), pictures the difficulties met by the specialist endeavoring to perform his duties in a general hospital, where the specialties are merely side issues. The service is apt to be barren of interest to the interne, who consequently devotes little time to it and does not acquire the special skill necessary for the proper handling of the cases under his charge. The same may be said of the general hospital nurse in the wards and operating room. He proposes an interne service of one year to take care of an eye, ear, nose and throat service, as is now practiced in St. Luke's Hospital, Chicago, with considerable satisfaction. In the same way a special nurse was assigned to the service and kept on duty for three months, but later it was found more satisfactory to employ a graduate nurse permanently.

G. S. D.

A Method of Dealing With the Capsule After Cataract Operations.

Reeder, D. F., Canal Zone (*Ophthalmic Record,* April, 1913), punctures the capsule with a needle, then introduces a hook into the opening and drags the capsule from the pupillary space, or tears through it. The exact mechanism of its action is not described. G. S. D.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

ALBERT C. SAUTTER, M. D.,

PHILADELPHIA.

MAX W. JACOBS, M. D.,

ST. LOUIS.

Autointestinal Intoxication in the Pathogenesis of Eczematous Keratoconjunctivitis.

COLOMBO, Parma (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), believes that repeated tests for indican must be made in cases of phlyctenular conjunctivitis, since purging, either by nature itself or by drugs, may cause the disappearance of this substance temporarily. He points out that patients with phlyctenular conjunctivitis frequently are of the scrofulous habitus with consequent weakness of the stomach and intestinal function, and suggests that these facts be borne in mind when considering autointoxication as a factor in this eye affection. In a series of 115 cases he found large or considerable quantities of indican in 82.6 per cent of his patients, while 17.4 per cent showed merely traces or absence of this substance. M. W. J.

Clinical Observations on Vaccine and Serum Therapy in Diplobacillus Conjunctivitis.

TSCHIRKOWSKY, Kasan (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), finds but few efforts recorded along these lines, owing, probably, to the efficacy of zinc. He used a vaccine made from twenty-four-hour cultures of Morax-Axenfeld bacilli on ascites-agar. After the cultures had been placed in normal saline, they were subjected to a temperature of 60 degrees, then shaken for a half hour to produce an emul-

sion. Subcutaneous injections of 1 to 1½ cm. were given, and the dose gradually increased; not more than four injections were administered. He used autogenous and the socalled polyvalent vaccines. His cures were not permanent, and certainly not rapid. Similarly poor results followed the use of serum. M. W. J.

Conjunctivitis Due to Ascarides.

Dorff, Freiburg (*Klin. Monatsbl. f. Augenheilk.*, December, 1912), has studied this condition and arrives at the folfollowing conclusions:

The secretion found between the intestinal canal and outer wall of the ascarides contains a substance which produces, especially in predisposed individuals, a severe conjunctivitis. Repetition of the inoculation produces a recurrence of less intensity than the original attack. Susceptibility varies with the animal species and the individuals. There are immune individuals. Predisposition is not influenced by the addition or abstraction of calcium from the trial animal.

The inflammatory phenomena are not produced reflexly, since anesthesia of the conjunctiva does not decrease the effect. The vessel walls are in all probability the point of attack, since the use of adrenalin suppresses the effect of the irritant.

He places this secretion of the ascarides in the same category with tuberculin, pollentoxin, etc., i. e., of specific vessel poisons. These substances are peculiar in that they are potent only in predisposed individuals. Passage through a filter does not change the potency of this substance.

M. W. J.

The Kurokusakame as a Cause of Eye Disease.

Takashima, Japan-Kiel (*Klin. Monatsbl. f. Augenheilk.*, December, 1912), has studied this insect, which is met with in the rice fields, where it is a source of danger to the crops and often causes eye disease. He found the body substance as well as the juice of the body a source of eye inflammation, producing edema of the lids and conjunctiva, followed by redness, lacrimation and mucopurulent discharge; a condition resembling that resulting from injury due to acids, alkalis, or mild burns. There is no formic acid or cantharidin present in the body juice. M. W. J.

Contribution to the Clinical, Bacteriologic and Pathologic Study of Parinaud's Conjunctivitis.

Arganaraz (Abst. in *Archiv. de Oftalm.*, January, 1913, and in *Woch. f. Ther. u. Hyg. des Auges*, May 8, 1913). Parinaud's conjunctivitis is characterized by four cardinal symptoms: Conjunctival inflammation with characteristic granulations, palpebral swelling, glandular swelling, and general symptoms (fever, malaise, etc.). Recovery in seven to ten months with complete restitution. The disease also involves the tarsus. It is not contagious and cannot be transferred to animals. The xerosis bacillus alone or in association with other bacteria seems to be the etiologic factor.

Silver nitrate is to be avoided on account of corneal irritation. Behring's serum is of value in the incipient stages.

A. C. S.

The Body Temperature in Affections of the Eye.

Igersheimer (*Zeitsch. f. Augenh.*, Vol. 29, Part 1: Abst. in *Woch. f. Ther. u. Hyg. des Auges*, April 3, 1913). Aseptic incisions of the globe do not influence body temperature. Postoperative infections, hypopyon, panophthalmitis, elevate body temperature, which after exenteration returns in several days gradually to normal. Nonpurulent intraocular inflammations have no influence on body temperature. Purulent affections of the cornea are usually accompanied by a rise of temperaure—subfebrile—which returns to normal with the healing of the ulcer. The temperature is not proportional to the severity of the ulcerative process; the same obtains in animals. Experiments show that the rise is not due to the bacteria per se, but to their products, which gain access to the anterior chamber. In the human eye the process is probably analogous.

A. C. S.

Experimental Tests on the Retinal Changes Caused by the Injection of Blood Into the Vitreous.

Koyanagi, Kioto (*Klin. Monatsbl. f. Augenheilk.*, December, 1912), comes to the following conclusions: 1. Injection of a rabbit's own blood into its vitreous produced no inflammatory changes in the uveal tract.

2. In the retina the following changes occurred: (a) A glial proliferation proceeding from the ends of the supporting fibers of Müller, extending parallel to the surface of the retina

and consisting of two layers. (b) Primary degeneration of the retina, which appears at first in the outer layers.

3. The newly formed tissue, which proliferates from the optic disc deep into the vitreous and even into the blood mass, is the product of real connective tissue, and apparently plays an important role in the resorption of blood.

4. This newly formed structure brings about a detachment of the retina, which occurs later—perhaps because of repeated injections of blood.

5. A bleb which appeared on the ciliary body, he attributes to sudden and persistent secretory activity.

6. He believes from his experiments evidence has been deduced to show that retinal and vitreous hemorrhages are a factor in the production of retinitis proliferans.

The newly formed tissue in retinitis proliferans consists principally of glia. In recurring hemorrhages into the vitreous we must accept as correct the statement that it is real connective tissue which proliferates from the papilla.

M. W. J.

Carbolic Acid Gangrene.

Exner (*K. K. Ges. der Aerzte in Wien*, January 17, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, March 20, 1913) reports a case of gangrene of the lids and loss of an eye following the application of a carbolic acid lotion for hordeolum in a Bulgarian soldier. A. C. S.

A Case of Hyaline Amyloid Degeneration of the Conjunctiva.

Kolominsky, Dorpat-Jurieff (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), describes a case of hyaline amyloid degeneration of the lid conjunctiva which differs from previously reported cases in showing many newly formed blood vessels. He therefore thinks that we have to deal with an angioma-like growth in which a hyaline amyloid degeneration developed which did not limit itself to the connective tissue, but involved the vessels and their contents. A mass of amyloid substance formed in this way and became surrounded by a kind of connective tissue capsule which was formerly vessel wall. Leber attributed to this capsule the production of the amyloid substance, but Kolominsky found no cell elements which showed changes which might be considered evidence of amyloid degeneration. M. W. J.

Pyemic Embolus in the Limbus Corneæ.

Perlia, Krefeld (*Klin. Monatsbl. f. Augenheilk.*, December, 1912), reports a case of embolus in the limbus of the cornea which appeared during an attack of pyemia. The posterior chamber of the eye was not involved. Recovery with normal vision. M. W. J.

Keratoconus.

Bielschowsky (*Muench. med. Woch.*, 1913, No. 4; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, April 3, 1913) reports a case of high grade bilateral keratoconus in a thirty-five-year-old woman. Vision, O. D., 1/60; O. S., 1.5/60. The vision of the left eye was improved to one-third normal by a glass prothesis manufactured by F. Mueller, Wiesbaden. The prothesis causes no discomfort and can be introduced by the patient without the use of cocain. A. C. S.

A Case of Band-Shaped Corneal Opacity in Association With an Old Corneal Scar.

Akatsuka, Osaka-Vienna (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), describes a case in a woman of 74 years whose cornea was injured in her youth with a needle. During the nine months previous to her admission to the hospital the vision of this eye had gradually failed. She had an opacity in the center of the cornea which corresponded to the temporal end of the linear scar produced by the old injury. Akatsuka considers the opacity due to deficient nutrition brought about by the very small scar of the cornea which hindered the normal circulation. M. W. J.

On Internal Rupture of the Sclera With Observations on Ring Abscess.

Stölting, Hannover (*Klin. Monatsbl. f. Augenheilke*, January, 1913), reports a case of internal rupture of the sclera in which the histologic examination showed a choroidal inflammation which he thinks offers an explanation for the phenomenon. The inflammation set up a glaucoma, and the tissues in the anterior half of the eyeball, already weakened by the pathologic process, readily yielded without direct trauma having occurred. He believes we are dealing with a condition described by Fuchs, but while the latter thinks the separation of

the borders of the tear occurs shortly after an injury, Stölting believes this separation due to the increased tension. He shows that a separation of the cell elements in the region of the ligamentum pectinatum, etc., occurs, and that lymph readily enters the cornea behind Descemet's membrane, instead of flowing through the normal channels. The anatomy of this region is described at some length, to show the rationality of his view. The region between the outer border of Descemet's membrane and the inner wall of Schlemm's canal is a vulnerable point when for any reason the usual points of exit from the anterior chamber are closed because of inflammation of the anterior portion of the choroid. Lymph or infectious material is then forced through this point of least resistance, producing a rupture of the inner layers of the sclera, or, as Stölting suggests, when septic material is present, a ring abscess. Hemorrhage into the cornea probably also occurs in this way. He suggests immediate drainage of the anterior chamber on the appearance of a ring abscess. M. W. J.

Apparently Spontaneous Iridodialysis.

Perlia, Krefeld (*Klin. Monatsbl. f. Augenheilk.*, December, 1912), reports a case of apparently spontaneous iridodialysis which he thinks can only be explained by the complete resorption of a new growth at this site. He calls attention to Fuchs' explanation of a similar case where the previous existence of a syphilitic nodule was the reason for the apparent spontaneity of the dialysis. M. W. J.

Cataracta Nigra.

Elschnig and v. Zeynek (Scientific Meeting of German Physicians in Bohemia, December 6, 1912; *Muench. med. Woch.*, 1913, No. 2; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, March 20, 1913). Elschnig in the past five years observed one cataracta nigra and seven cases of cataracta brunescens in 1,500 extractions.

V. Zeynek examined two lenses with cataracta nigra and found they consisted of outer colorless lamellæ and yellowish brown, transparent inner lamellæ. Histologic examination disclosed no pigment granules.

A brown pigment was obtained from the yellowish lamellæ after extraction with three per cent caustic soda. Spectro-

photometric tests excluded blood pigment. The writer attributes the color to a degeneration of albuminous bodies in the lens, the result of nutritional disturbances and cornification.

A. C. S.

Connective Tissue Proliferation on the Posterior Lens Capsule Resembling Glioma Retinæ.

Velhagen, Chemnitz (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), examined a microphthalmic eye of an infant seven weeks old in whom glioma retinæ had been diagnosed and found nothing but connective tissue on the posterior lens capsule. He warns that we should first think of connective tissue proliferation in eyes which are even slightly congenitally deformed, before we make a diagnosis of glioma. Even if the mass increases in size we need not be in a hurry to modify our diagnosis. When a wrong diagnosis is made no great misfortune has occurred, for in these eyes complicated cataract with subsequent destruction of the organ occurs sooner or later, while a glioma left undisturbed because of overcaution will always be the greater oversight. M. W. J.

Concerning a Peculiar Case of Sarcoma of the Ciliary Body.

Akatsuka, Osaka-Vienna (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), reports a case of ciliary body sarcoma which, contrary to what has hitherto been observed, grew through the pupil into the interior chamber, a complication heretofore observed only in new growths of the retinal iris and ciliary pigment. Sarcomata of the ciliary body usually grow out through the angle of the anterior chamber. Fuchs saw the case before enucleation and thought the growth originated in the retinal epithelium of the iris or ciliary body. The case demonstrates that ciliary sarcomata may simulate growths of the retinal epithelium. M. W. J.

Two Cases of Melanotic Sarcoma of the Choroid.

Rollet and Aubrand (*Lyon med.*, 1912, No. 51; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, March 6, 1913). The first was one of typical melanotic sarcoma of the choroid. The second case had been iridectomized for glaucoma two and one-half months previously, which was followed by an equatorial sclerectomy because of continuance of pain. Reduction of

tension from 70 to 40 mm. Soon after tension again rose with the formation of a peribulbar staphyloma. The possibility of intraocular growth was considered and the eye enucleated.

Histologic examination showed a sarcomatous proliferation in the center of the globe and complete obliteration of the sclerectomy opening. There was also an equatorial and intercalary staphyloma, not the result of the invasion of the tumor growth, but the result of hypertension. The case shows that the location of the tumor is not always indicated by the position of the staphyloma. A. C. S.

Acute Suprachoroiditis Complicated With Glaucoma, Plastic Panophthalmitis and Equatorial Staphyloma.

Coronat and Aurand (*Lyon med.*, 1912, No. 49; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, February 27, 1913). The first symptoms noted were those of a mild iritis, which promptly responded to the usual treatment. Two months later iritis and status glaucomatosus. Intraocular tumor was thought of and the eye nucleated. There was an equatorial staphyloma. Histologic examination showed acute, infectious sclerochoroiditis or suprachoroiditis with secondary involvement of the episclera, entire uveal tract, retina, papilla and vitreous, the changes suggesting a kind of infectious plastic panophthalmitis.

The case is interesting on account of the intensity of the scleral inflammation, the involvement of the entire uveal tract and retina, and the rapidly produced deformity of the globe in association with hypertension suggesting intraocular new growth. A. C. S.

Thrombosis of the Central Vein and Metastatic Ophthalmia.

Purtscher, Vienna (*Klin. Monatsbl. f. Augenheilk.*, January, 1913), reports a case of metastatic ophthalmia in a patient who went through an attack of pneumonia shortly after the appearance of a thrombosis of a branch of the central vein of one eye. The other eye became inflamed soon after the beginning of the pulmonary trouble. Pneumococci were recovered from cultures made from the suppurating eye. Increase of tension and ring abscess formation also occurred, which, in view of Stölting's article in this same number of the *Klin. Monatsblätter*, makes the case all the more worthy of careful consideration. M. W. J.

A Case of Criminal Abortion Exhibiting One-Sided Amaurosis Under the Guise of an Embolus of the Central Artery of the Retina, With Markedly Good Recovery of Vision and of Field.

Gjessing, Drammen, Norway (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), saw a young woman who shortly after an abortion developed amaurosis of one eye. Gjessing's diagnosis was embolus of the central artery of the retina, in spite of the fact that the amaurosis, which had existed several days when he first saw her, cleared up within six weeks. He reminds his readers that our prognosis in cases of amaurosis due to embolus of the central artery of the retina is a serious matter, and quotes Elschnig's postulate that a restitution of vision never occurs in retinal embolism when twenty-four hours have once elapsed. Gjessing excluded thrombosis, endophlebitis and anemia as possible causes of the amaurosis. He explains the improvement in vision from 0 to 5/5 36 in six weeks by the presence of a highly developed cilioretinal system which rapidly developed a new circulation. M. W. J.

Concerning Hemorrhage Between the Retina and Vitreous.

Guzmann, Vienna (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), discusses the question whether or not the membrana limitans interna forms the anterior wall of the hemorrhage. His first case, because of its striated appearance and projections downward from the hemorrhagic mass, was, to his mind, one of hemorrhage directly beneath the vitreous. In another eye enucleated because of ring abscess, Guzmann found a macular hemorrhage which was limited anteriorly by the membrana limitans interna. The first case was under observation when the hemorrhage appeared, so he considers that the two eyes disprove the assertion Komoto recently made, that a true preretinal hemorrhage must occur at the macula.

M. W. J.

The Recognition of Secondary Tuberculosis of the Retina.

Agricola, Hannover, and Thies, Dessau (*Klin. Monatsbl. f. Augenheilk.*, January, 1913), discuss the question of perivascular changes and their relationship to tuberculosis. They think toxic substances alone will not explain the phenomena, and suggest that we may be dealing with a condition allied to the local reaction seen in the external coats of the eyes of per-

sons who are tuberculotoxic. Their study of the subject, as well as their own material, prompts them to say that these foci are not primary or hematogenous in origin, but that they are rather lymphatic metastases of chorioretinitic processes.

M. W. J.

Cyst Formation in the Retina.

Velhagen, Chemnitz (*Klin. Monatsbl. f. Augenheilk.*, December, 1912), reports a case of cyst of the retina which was apparently visible with the ophthalmoscope. A second case showed cysts which were not visible ophthalmoscopically. Both eyes had become glaucomatous before enucleation. Since glaucoma impedes resorption, he considers this of importance in the etiology. M. W. J.

Contribution to the Pathologic Anatomy of Intraocular Cysticercus.

Wittich, Jena (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), examined an eye microscopically which had been enucleated for malignant growth, and found a cysticercus. The parasite was in the retina itself, and therefore had entered by the arteria centralis. The changes in the eyeball were limited to a very small area, as the enucleation was done relatively early, and it was this which made the histologic examination of interest. A feature was the large number of eosinophiles in the connective tissue capsule and parts in the immediate vicinity of the parasite. M. W. J.

Contribution to the Knowledge of the Central Green Spot in Myopia.

Bietti, Sienna (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), mentions that Stargardt considers this phenomenon as due to a proliferation of unpigmented cells, and goes on to describe a green area at the posterior pole of a highly myopic male of nineteen years. This was sharply limited by a black pigmented border, and showed no difference in level from the rest of the eyeground, when examined by the direct method. There was a central scotoma for colors. No retinal vessels reached the green area, and owing to the color of the eyegrounds, the relationship of the choroidal vessels to the colored area could not be ascertained. Butler recently reported a case of similar appearance, but thought the condition was one of a

hole of greenish color. As the illustrations in his article showed darker areas in the green, he attributed the color to blood pigment changes. M. W. J.

Posterior Venæ Vorticosæ, Myopia, Amblyopia.

Attias, München (*Klin. Monatsbl. f. Augenheilk.*, December, 1912), has studied a series of cases in which the posterior vortex veins, or at least vortex veins, were seen at the posterior pole. He found all of such eyes myopic and of low visual power, aside from the myopia. M. W. J.

Traumatic Hole Formation at the Fovea.

Purtscher, Vienna (*Klin. Monatsbl. f. Augenheilk.*, January, 1913), reports a series of cases in which after trauma defects were found at the macula. One case, which was seen within a few hours after the injury, showed no central scotoma, but the macular region showed a commotio retinæ. A few days later, when the commotio had disappeared, a macular deficiency with scotoma was found. The findings lend evidence to Fuchs' opinion, that these holes are the result of tissue destruction, perhaps by absorption, and not the sequela of tearing of the tissues. M. W. J.

Studies in Glaucoma.

Lange, Braunschweig (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), reports a case of acute glaucoma after the use of homatropin, and one of hemastatic glaucoma in a patient with glaucoma simplex, after eserin. He attributes the condition to the diminution of the size of the perilenticular space by the drug, and reiterates his earlier assertion, that in socalled glaucoma inflammatorium we are not dealing with visible inflammatory manifestations in the pathologicoanatomic sense, but that blood and lymph stasis phenomena are concerned. He proposes the term glaucoma hemostaticum (Elschnig has proposed compensated and uncompensated glaucoma for the old terms glaucoma simplex and glaucoma inflammatorium), and offers as proof the fact that energetic accommodation has been known to dissipate in a short time an attack of socalled inflammatory glaucoma. A real inflammation would not react to such a measure, but a stasis would. It is unreasonable, he

thinks, to continue using the term inflammatory glaucoma, in view of these observations made by himself and other ophthalmologists. M. W. J.

Glaucomatous Excavation of the Papilla and Neuritis Optici.

Bietti, Sienna (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), reports this rare condition, which was very apparent ophthalmoscopically: An inflammatory glaucoma followed fifteen days after a neuritis of unknown etiology in a patient who had the same eye operated upon some years before for glaucoma. Whether the blocking of the posterior lymph channels, because of the nerve inflammation, was a factor in producing the acute glaucomatous attack, is questionable, Bietti thinks, but it was instrumental in producing a marked congestion of the uveal tract with hemorrhages. M. W. J.

Retrobulbar Neuritis With Amaurosis Lasting Eight Days Associated With Acute Cerebral Symptoms in Consequence of Infectious Multiple Neuritis.

Cramer, Kottbus (*Klin. Monatsbl. f. Augenheilk.*, January, 1913), saw a case of multiple neuritis with marked brain symptoms. From fingers at one-half a meter, with central scotomata for all colors as well as for white, vision gradually rose to three-tenths and one-tenth, respectively, and the scotomata largely disappeared. The knee and Achilles reflexes disappeared permanently. M. W. J.

Neuritis and Iridocyclitis in Diabetes Insipidus.

Stoewer, Witten (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), treated a patient suffering with a mild iritis and neuritis accompanying a diabetes insipidus, with subcutaneous injections of strychnin. The eye condition as well as the constitutional trouble apparently were cured. Stoewer suggests that eye changes during diabetes insipidus are possibly due to the influence of certain products of metabolism.

M. W. J.

Malarial Optic Neuritis.

Bourland (*Ann. d'Ocul.*, November, 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, February 27, 1913) reports two cases of simple papillitis with consequent atrophy due to malaria. He believes that in countries where malaria is endemic

the disease is responsible for a large number of ocular affections, particularly optic neuritis. In the latter the prognosis is by no means so favorable as commonly supposed, sometimes complete atrophy resulting. The eyes of malarial patients should be routinely examined, since normal visual acuity does not always exclude the presence of optic neuritis.

A. C. S.

Quinin Amaurosis.

Kulebjakin (*Wjestnik Ophthalmologii*, 1911, X; Abst. in *Prager med. Woch.*, 1913, 11, and *Woch. f. Ther. u. Hyg. des Auges*, April 17, 1913) reports three case of quinin blindness caued by the accidental ingestion of 6.5 grains, 10 grains and a tablespoonful of quinin, respectively. Within one-fourth to one-half hour signs of general intoxication, and in twelve hours amaurosis lasting ten to forty-eight hours. Within a week to several months, return to normal central visual acuity. Examination of the eye grounds showed pallor and pronounced constriction of the vessels. Strychnin was administered subcutaneously in the temporal region. In one case fibrolysin was used.

A. C. S.

Two Cases of Amaurotic Family Idiocy.

Braunstein (*Wratschebnaja Gazeta*, 1912, No. 36; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, April 3, 1913) reports two typical cases and reviews the symptomatology and pathology.

A. C. S.

Exophthalmic Goiter With Choked Disc in a Fourteen-Year-Old Boy.

Hourcardy (*Societe Med.-Chir. de Liege*, November 16, 1912; Abst. in *Woch. f. Ther. u. Hyg. des. Auges*, April 3, 1913) reports such a case with choked disc in each eye causing visual impairment. Intracranial tumor was suspected, but subsequent examination favored a diagnosis of exophthalmic goiter, and the patient was placed on antithyreodin treatment, resulting in a general improvement and improvement in the ocular condition, tachycardia, tremor and exophthalmos. The goiter, however, remained uninfluenced. Only 5.3 per cent of all cases of exophthalmic goiter occur under the age of fifteen. The prognosis is more favorable in the young.

A. C. S.

The Significance of Choked Disc.

Schieck (*Deutsche med. Woch.*, 1913, No. 1; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, March 6, 1913). According to Schieck's investigations, choked disc results from penetration of the cerebrospinal fluid into the preformed perivascular lymph spaces of the axial sheath and along the central vessels. Etiology: (a) Hypertension of the cerebrospinal fluid (brain tumor, meningitis, etc., tumors and inflammatory processes of the orbit). (b) Continued ocular hypotension (after ocular traumatism, collapse of the vessels in the axial sheath after profuse hemorrhage). A. C. S.

The Relationship Between the Eye and Nose.

Hajek (*Wiener klin. Rundschau*, 1913, No. 10; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, May 8, 1913) claims that because many cases of acute and chronic retrobulbar neuritis with associated normal or only slightly abnormal rhinologic findings are benefited, sometimes permanently, by nasal treatment, this should not be considered conclusive evidence of a nasal etiology, although he concedes, of course, that the temptation is strong to attribute the good results obtained to such interference. In many of these cases the improvement is only temporary, and the true etiology (lues, multiple sclerosis) is finally revealed. Many would have recovered without nasal treatment. To illustrate his point he cites the history of a young woman who showed a unilateral acute retrobulbar neuritis after a mild attack of influenza. Rhinologic examination proved negative; nevertheless, he was persuaded, much against his will, to drain the ethmoid. To his surprise vision returned to normal within ten days. Several weeks later the other eye became similarly affected. Operation was again advised, but the writer refused to follow out this suggestion. There was slight further deterioration of vision and then a return to normal, exactly as in the other eye.
A. C. S.

Ocular Injuries Due to Forceps Delivery.

Pincus (*Muench. med. Woch.*, 1912, No. 53; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, March 6, 1913). In the first case, after a severe forceps contusion, almost the entire cornea became opaque, especially marked in a band running

obliquely from the temporal to the nasal limbus. One-half year later the periphery of the cornea had become transparent. The second case (a seventeen-year-old boy) showed a right-sided paralysis of the sympathetic—ptosis, miosis and enophthalmos. He ascribes the condition to a lesion of the cervical ganglion or cervical sympathetic nerve. A. C. S.

Eye Injuries Due to Foreign Bodies.

Lange, Braunschweig (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), reports several cases of injury to the eye and adjacent parts. In one a foreign body, evidently iron, in the middle of the optic disc, caused a concentric contraction of the visual field. He thinks this was due to pressure atrophy of those fibers emerging at the center of the papilla which supply the periphery of the retina.

A second case showed a clear lens after injury with a copper splinter. The foreign body remained in the lens.

In another patient injured with a rusty pen point a traumatic cataract cleared up completely, leaving only a very fine scar. This case was complicated by a plastic iritis.

In a young man who shot himself accidentally with a revolver, the ball lodged in the upper wall of the orbit without causing a marked injury to the globe or large vessels. The missile entered through the upper lid, and an interesting feature was the presence of recurrent hemorrhages in the anterior chamber, although the eye remained quiet.

His last patient was a child in whom a rifle ball entered the right temple anteriorly and lodged in the temporal wall of the left orbit. The patient made a good recovery as regards vision. Lange attributes the minimal damage largely to the softness of the bony structures because of the early age of the patient. M. W. J.

A Case of Associated Movements of the Upper Lid Which Could Be Induced Voluntarily.

Lutz, Havana (*Klin. Monatsbl. f. Augenheilk.*, January, 1913), reports this case to reiterate his views regarding the seat of the lesion, and because the movements could be voluntarily induced. He places the lesion in the supranuclear region of the eye muscle nuclei, and believes the controlling apparatus at this point inactive. A real nuclear lesion of other

eye muscles follows the advancement of the lesion into the nuclear area proper. The fact that Lutz's patient could produce the lid movements voluntarily, speaks for the intactness of the cortical tract. M. W. J.

Acquired Paralysis of the Ocular Muscles in Children.

Lundsgaard, Copenhagen (*Klin. Monatsbl f. Augenheilk.*, December, 1912), observed five cases of paralysis of the ocular muscles in children under five years of age during an epidemic of acute anterior poliomyelitis, and by a process of exclusion, attributed the condition to this disease. M. W. J.

Nystagmus.

Dimmer, Vienna (*Ofiz. Protokoll d. Wiener. klin. Woch.*, 1913, 4; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, February 27, 1913), reports a case of horizontal, pendulous nystagmus in a thirty-eight-year-old man, a locksmith by trade. Vision in each eye was .2, and the eyegrounds normal. Nystagmus had existed since childhood. Though there was no demonstrable evidence of apparent movements of objects, the patient could read print much more readily when he held the book sideways so that the lines of print ran vertically, or he would tilt his head to one side. He refers to a similar case which he reported in 1905, and states that these two seem to be the only cases reported showing this peculiarity (?). He submits photographs of a printed strip of paper. One was the result of moving the strip horizontally to and fro ten times, the other an equal distance vertically ten times, the time of exposure in each case being the same. The print is illegible in the photograph of the horizontally moved, but legible in that of the vertically moved strip. A. C. S.

Nystagmus Retractorius, a Cerebral Focal Symptom.

Elschnig (*Prag. med. Klin.*, 1913, No. 1; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, March 20, 1913) some years ago observed in a case of brain tumor retraction of both eyes with slight convergence but without miosis when voluntary movements of the eye occurred. The latter occurred slowly with apparent effort and at times with deficient excursion. He attributed the disturbance to a lesion in the aqueduct of Syl-

vius, a diagnosis subsequently confirmed by autopsy examination, which disclosed a cysticercus in the aqueduct.

He reports the findings in a similar case in which pathologic examination revealed a malignant tumor of the third ventricle and the region of the pineal body.

This symptom should be looked for in every case of disturbance of ocular motility, cerebral hemorrhage, etc. He thinks the condition is the result of a cumulative innervation of all external ocular muscles, due to a diffuse pressure upon the nuclei and their connecting fibers in the aqueduct of Sylvius. A. C. S.

On Ocular Disturbances as Causes for General and Localized Nervous Disorders.

Bielschowsky (*Muench. med. Woch.*, 1913, No. 4; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, April 17, 1913) discusses Stevens', Savage's and Schoen's contributions to the literature on this subject. After a systematic study of a series of cases, Bielschowsky claims heterophoria occurs no more often in cases of functional neuroses and psychoses than in healthy individuals, thus taking exception to Schoen's views, which consider heterophoria of importance in the etiology of neuroses. Bielschowsky believes that in individuals with intact nervous system, heterophoria is unable to produce neuroses, but that in neuropathic subjects often slight disturbances of muscle balance may give rise to marked symptoms.

A. C. S.

Dazzling and Nyctalopia.

Schmidt-Rimpler, Halle (*Klin. Monatsbl. f. Augenheilk.*, December, 1912), repeats the assertions made by himself and others, that a certain relationship between the degree of peripheral and central illumination must exist in order to obtain a corresponding visual acuity for a centrally placed object and to avoid dazzling. Complaints of nyctalopia in cases of optic nerve and choroidal disease are due to abnormal illumination of the periphery of the retina. In individuals who already suffer with diminished central vision, a moderate peripheral illumination is sufficient to make central vision less clear, whereas a much higher degree of peripheral illumination would be necessary to produce the same effect in a normal eye. M. W. J.

Vision in the One-Eyed.

Zeeman, Amsterdam (*Klin. Monatsbl. f. Augenheilk.*, December, 1912), suggests that binocular vision is more convenient, rather than more exact. He is of the opinion that accommodation is not a factor in stereoscopic vision. The one-eyed person is without the aid of parallactic movements and of convergence possessed by the two-eyed, and requires longer time to decide depth at which objects are situated. He believes that intelligence is a factor in determining the capability of a one-eyed person, and that sameness in the character of work done by the individual will sooner render him qualified for a certain kind of work. No method of measuring monocular sense of depth and no apparatus can give us the working efficiency of one-eyed persons. In cases where the individual has apparently become habituated to the highest degree, a difference in the ability to estimate depth will remain between the one-eyed and the two-eyed, since the former requires at least one-half a second for this purpose, and the latter one two-hundredth second. To this factor perhaps can be attributed the asthenopic symptoms of the one-eyed. Although usually greater attention and effort are required by the one-eyed, still the absence of any asthenopic symptoms in some one-eyed individuals tends to prove that these extra efforts frequently do not exceed normal capacity.

M. W. J.

Treatment of Divergence by Overcorrecting Concave Glasses.

Landolt, Strassburg i. Els (*Klin. Monatsbl. f. Augenheilk.*, January, 1913), treated cases of high degree convergence insufficiency and of divergent squint with concave glasses. He advocates the use of overcorrecting concave glasses, particularly in young patients, because of their full power of accommodation. As overcorrecting glasses stimulate the convergence impulse, this method is useful in true divergent squint, whereas prisms are only of value in insufficiency of convergence.

M. W. J.

Operation of Senile Cataract With the Keratome.

Weill, Strassburg (*Klin. Monatsbl. f. Augenheilk.*, January, 1913), states that the smallness of the incision made by the keratome has prevented its general adoption, in spite

of recognized advantages, such as rapid approximation of wound edges, etc. Weill operated on fifty cases with an ordinary keratome of the bent variety, and enlarged the initial opening by not withdrawing the blade through the original incision. The lens is delivered less rapidly by this method, as the wound does not gape as much as in the operation with the Graefe knife. M. W. J.

The Technic of the Elliott Trephine Operation.

v. Mende, Mitau (*Klin. Monatsbl. f. Augenheilk.*, January, 1913), believes many of the complications which have followed Elliott's operation are due to the fact that the conjunctival flap obscures the field of the operation about the limbus. He therefore prepares his flap as follows: A 4 mm. long incision is made 4 mm. from and parallel to the limbus, in the upper outer quadrant. From its lower end another cut is made reaching to the limbus. The flap is then prepared as far down on the limbus as possible and turned upward. At the site of the intended trephining the epithelium is scraped off. After the usual Elliott operation the flap is made to overlap the cornea somewhat, and is attached to the globe by sutures. M. W. J.

The Question of the Glaucoma Operation.

Gilbert, München (*Klin. Monatsbl. f. Augenheilk.*, December, 1912), reiterates the warning concerning operations on advanced cases of glaucoma simplex. As evidence that pressure is not the factor which explains the rapid loss of vision after such operations, Gilbert calls attention to evidence of disturbances in circulation, as shown by ophthalmoscopic findings, towit, the appearance of a mild degree of edema of the papillary tissues, of capillary hemorrhages, and the recession of the glaucomatous excavation. M. W. J.

On a Method of Advancing Eye Muscles.

Lange, Braunschweig (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), thinks the value of all advancement operations depends on their capacity to prevent cutting through or tearing of sutures during the process of tying. He describes his procedure, which seeks to relieve all tension while

the sutures are being tied, as well as after the operation has been completed. In advancing the internal rectus, he begins by passing a rather thick thread through a fold of conjunctiva 4 mm. to the temporal side of the limbus and allows the ends to remain in the tarsal cleft. The internus is then prepared for advancement, but before it is fastened to its new insertion, the eyeball is rolled by the assistant toward the nose, by means of the temporally placed suture. This temporal suture is then fastened to the bridge of the nose by adhesive plaster. Sutures are removed on the fifth day.

M. W. J.

Contribution to the Treatment of Pulsating Exophthalmos.

Ginzburg, Kiew (*Klin. Monatsbl. f. Augenheilk.*, December, 1912). To the cases of pulsating exophthalmos reported by Sattler and Keller prior to 1898 he has added those published prior to 1910. Good results following the ligation of the vena ophthalmica lead Ginzburg to the conclusion that this operation should first be performed and not follow the ligation of the carotid. M. W. J.

The Cauterization of Corneal Ulcers.

Cantonnet (*Le Progres med.*, 1912, No. 49; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, February 27, 1913). Thermo- and galvanocauterization should be performed only by ophthalmologists. The practitioner may safely employ hot air cauterization. Hot air is aspirated into an ordinary hypodermic needle in the following manner: the needle point is cut off and screwed to the barrel of the syringe, which has been warmed, and the needle then held in the flame of an alcohol lamp and air aspirated. The end of the needle is held 2 to 3 mm. from the ulcer and the hot air bath applied. Cauterization with tincture iodin from which the alcohol has evaporated is also recommended. A. C. S.

Radium Treatment of Conjunctivitis Vernalis.

Schnaudigel, Frankfurt a. m. (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), reports that in a case of vernal conjunctivitis the use of radium produced a radical cure, after cauterization and the use of the recognized drugs had proven of no value. In one eye a single application of 10

mg. of radium bromid in the ebonite capsule sufficed; in the other, seven applications were made at intervals of not less than a month, and usually for from twenty to thirty minutes at a time. M. W. J.

Cauterization With Carbon Dioxid Snow in Granular Ophthalmia.

Nuel (*La Sem med.*, 1913, No. 1; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, March 20, 1913) refers to Wibo's report of seven cases of granular ophthalmia successfully treated with the carbon dioxid snow stick. Cocain anesthesia. Cure within two to four weeks. A. C. S.

Concerning Ineffectual Atropin Mydriasis in Parenchymatous Keratitis.

Wichierkiewicz, Krakau (*Woch. f. Ther. u. Hyg. des Auges*, April 3, 1913), refers to the ineffectual mydriasis often obtained by conjunctival instillations of atropin in cases of severe parenchymatous keratitis. This he attributes to impaired diffusion capacity of the cornea, which is especially marked in vascularized corneas. In such cases he injects subconjunctivally one drop of a ¼ per cent atropin solution once daily or every other day, full mydriasis being secured by this method in uncomplicated cases. Equally good results were obtained in eczematous and trachomatous keratitis. In cases in which this method is not applicable, suprarenin or adrenalin instillations should precede the atropin instillation.

A. C. S.

Neosalvarsan in Parenchymatous Keratitis.

Hoehl (*Muench. med. Woch.*, 1913, No. 2; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, March 20, 1913) treated seven cases of parenchymatous keratitis (three acute, four regressive) with freshly prepared 2½ per cent neosalvarsan solution, instilling one to two drops twice a day for four weeks. In no case was any particular improvement noted. This is not surprising in the light of recent investigations, which suggest a nonspirochetic affection of the human cornea. A. C. S.

The Action of Mesothorium Upon the Visual Apparatus.

Chalupecky (*Wiener klin. Rundschau*, 1913, No. 1; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, March 20, 1913) studied

the action of mesothorium upon the rabbit eye, and found the result similar to that caused by the X-ray or radium. Of the three, X-ray is the most powerful. Mesothorium is, however, considerably cheaper than radium. A. C. S.

Fixation Mark for the Ophthalmometer.

Elschnig, Prag (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), attached an endoscope lamp by a ring to the end of the telescope of the ophthalmometer. By means of a rheostat and resistance box the cords are connected with the current supplied to the transparent images of the instrument. By a switch he can light either the fixation lamp or the lamp and the wires. With the rheostat he can increase or decrease the intensity of the fixation lamp. M. W. J.

On the Stimulus Threshold of the Pupillary Reaction and the Extent of the Pupillomotor Region of the Retina.

Schlesinger (*Deutsche med. Woch.*, 1913, No. 4; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, April 17, 1913) describes his peripupillometer, which consists of a horizontally placed observing apparatus containing a microscope and an illuminating device. Experiments with this delicate instrument gave the following results:

1. An approximately constant stimulus threshold in normal individuals of the same age.
2. The pupillary reflex is capable of fatigue.
3. The interval between the application of the light stimulus and the visibility of contraction increases after repeated stimulation.
4. Writer's earlier views, favoring a lower stimulus threshold and more pronounced reflex fatigue in neurasthenics, are not confirmed by tests with the peripupillometer.

The pupillomotor area of the retina has an average radius of at least 5 mm. The hemianopic reaction is readily seen with this instrument. A. C. S.

On the Localization of Objects in the Background of the Eye.

Rettsch, Hirschberg i. Schl. (*Klin. Monatsbl. f. Augenheilk.*, January, 1913), has devised an apparatus constructed like a perimeter with 180 notches to denote degrees. The examin-

ing oculist fixes his ophthalmoscope in one of these notches. For the fixation a second upright supporting rod is placed to one side of the middle upright. The two upright supports can be adjusted according to the distance between the two eyes and so revolved that they can be used on either eye of the person to be examined. To prevent raising or lowering of the patient's eye, a fixation mark is placed at the turning point of the perimeter. This fixation mark can be advanced or receded. A supplementary dial, attached to the rod which fixes the patient's eye, enables one to mark out on the eyeball the meridian in which the foreign body is located.

M. W. J.

Skiascope Spectacles.

Visser, Lochem, Holland (*Klin. Monatsbl. f. Augenheilk.*, November, 1912), has devised a spectacle frame with reversible nosepiece, so that plus lenses can be used on one side and minus on the other. The lenses are already in the frame and the various strengths arranged by means of short rods which introduce or withdraw the lenses in front of the eye under examination. The apparatus in its simplest form was devised for oculists who determine the point of reversal largely by changing their distance from the patient. M. W. J.

Combined Eye Electrode and Irrigator.

Bucky (*Muench. med. Woch.*, 1913, No. 4; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, April 17, 1913) describes a combined eye electrode and irrigator made of glass and shaped to fit snugly over the eye. Rubber tubes are attached to the upper and lower margins for irrigation purposes. When electrical treatment is desired, the apparatus is filled with saline solution and the current introduced through an inserted electrode. Through the upper opening a thermometer may be introduced. A. C. S.

The History of Eyeglasses.

Greeff, Berlin (*Klin. Monatsbl. f. Augenheilk.*, January, 1913), describes the early forms of eyeglasses as seen in pictures of the fourteenth, fifteenth and sixteenth century as well as in the collections at Nurnberg, Munich, Paris and other cities. The article is illustrated and will be continued.

M. W. J.

The Italian Oculist's Fee.

The Practica Oculistica, Rome, November, 1912 (*Woch. f. Ther. u. Hyg. des Auges,* March 20, 1913), publishes the new rate of charges of the Italian oculist. These in part are as follows:

	Lire.
Office consultation	10-20
Succeeding visits	5-10
Visit to the patient's house	20
Succeeding visits	5-10
Consultation fee	20-50
Complete examination without report	20-50
Complete examination with report	50-100
Prescription for spherical lenses	10
Prescription for cylindrical lenses	20
Prescription for combined lenses	25-30
Cataract operation	500-5000
Iris operation	250-500
Removal of foreign bodies from the cornea	20-50
Removal of tumors from the conjunctiva	50-300
Paracentesis	25-50
Orbital operation	200-2000
Squint operation	200-1000
Enucleation	200-500
Exenteration	100-200
Ptosis operation	200-500
Excision of the lacrimal sac	200-500
Lacrimal probing	10-20
Pterygium operation	50-100
Penetrating wounds of the globe, suture and excision of prolapsed tissue	200-300

A. C. S.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

M. W. Frederick, M. D.,

SAN FRANCISCO.

AND

Jesse S. Wyler, M. D.,

CINCINNATI.

The Etiologic Factor of Tuberculosis in Diseases of the Optic Nerve and Retina—Curative Action of Tuberculin.

Dutoit, Montreux (Le rôle étiologique de la tuberculose dans les affections du nerf optique et de la retine. Action curative de la tuberculine. *La Clinique Ophtal.*, April, 1913). Isolated tuberculosis of the optic nerve is a most rare condition and is nearly always associated with tuberculous meningitis. Von Michel claimed that this disease was not uncommon in miliary tuberculosis. The solitary tubercle of the choroid, although closely allied, cannot be classified as an optic nerve affection. Igersheimer's observations in two cases showed retrobulbar lesions which did not respond to tuberculin for about four weeks. According to Axenfeld and Stock, recurring hemorrhages of the vitreous make a clinical picture of primary tuberculosis of the retina. The literature of the subject is mentioned, but no personal observations are made.

J. S. W.

Cataract Operation With Conjunctival Suture.

Moret, Charleroi (Opération de la cataracte avec suture conjunctivale. *La Clinique Ophtal.*, April, 1913). The Kalt method of corneal suture is fully described with its various difficulties, because of which the author performs his own operation. A corneoconjunctival flap is separated from 6 to 7 mm. backward at the first incision. The extremity of this is grasped with a forceps and a fine needle with thin black

thread is passed about 2 mm. from the free edge. The needle is then passed through the bulbar conjunctiva about the insertion of the superior rectus muscle, care being taken not to include any episcleral tissue. A loose loop is placed to one side so as not to interfere with the operator's field. Now the iridectomy, capsulotomy, and extraction are completed, and then the thread is firmly tied; through the edges of the wound the iris angles can be nicely replaced and the pupil freed of débris without fear of vitreous loss.

The entire procedure does not require a minute added time, and the advantages are multiple:

(1) Safety from prolapse of the iris in simple extraction, and incarceration of the iris angles in the combined.

(2) Ability to clear the débris from the pupillary area without loss of vitreous; thus avoiding secondary operations even in immature cataract.

(3) Possibility of using a cystotome without danger upon a posterior calcareous lens capsule.

(4) Much less danger of infection, especially when lacrimation and conjunctivitis is present.

(5) Healing much more rapid without fear of turning of the flap.

(6) The patient need not be quiet following the operation.

This conjunctival suture can be used in all operations upon the bulb where it is possible to cut a corneoconjunctival flap.

J. S. W.

A New Procedure for the Surgical Cure of Strabismus.

Astruc, Marbonne (Un nouveau procédé pour la cure chirurgicale du strabisme. *La Clinique Ophtal.*, March, 1913). The surgery of strabismus has been either to advance a weakened muscle, or cut the antagonist, which is directly against the author's principles. In a squinting eye the one muscle is too short because of contracture, the other too long and weak because of stretching in youth and lack of contractile exercise. The methods commonly in use to correct these deviations are mentioned and their weaknesses laid bare, such as tenotomizing the strong muscle and putting nothing in its place, and myectomizing the long weak muscle and further lessening its strength. The lengthening of Landolt breaks the muscle fibers, and is practicable only in the fewest cases. In all cases of strabismus, either paralytic or concomitant, all operative pro-

cedure must be concentrated first upon correcting the too powerful muscle, and for this purpose the author has devised the partial myotomy.

The conjunctival incision is made as far from the limbus as possible. The muscle is caught in a hook with its concavity toward the occiput and cut with scissors three-fourths through inferiorly along the convex border of the hook as far from the insertion as possible. The hook is turned now a half circle so that the concavity is directed forward and the incision is carried three-fourths through superiorly, as before. See that the muscle moves freely after stretching it the desired length, and suture the conjunctiva.

The procedure is based upon correct principles, no sutures are necessary, healing rapid, and the performance easy. The article is well illustrated. J. S. W.

Colloidal Electrical Mercury (Electr-Hg.) in Ophthalmic Therapeutics.

Bruno (Le mércure colloidal électrique (Elect-Hg.) en thérapeutique oculaire. *La Clinique Ophtal.*, March, 1913) describes this production made by *Les Laboratories Clin.*, consisting of an aqueous suspension of ultramicroscopic particles of pure mercury. It is nontoxic in ordinary doses, and easily absorbed, because of its fine division. Observations in six cases fully reported show the effectiveness of this Electr-Hg. The author never uses salvarsan in eye diseases, because of its known deleterious effect upon the optic nerve. He states that this colloidal preparation may be utilized in any form of syphilis, and it will replace calomel, being less inconvenient and more readily diffusible. J. S. W.

The Elliot Operation.

Barraquer, Barcelona (Sur l'opération d'Elliot. *La Clinique Ophtal.*, March, 1913), advises trephining as the best of all sclerectomy operations because of the exactness, precision and facility of the maneuver. In a great percentage of cases an efficient anastomosis between the anterior chamber and the lymphatics of the conjunctiva results. Desiring to judge the anatomic results, the author performed this operation several times upon the cadaver, and he illustrates the results with cross sections in his article. From his researches

he advises a 2 mm. trephine, dissecting the conjunctiva back over the corneal margin by means of a scissors. The trephine is placed upon the most inferior part of the denuded area, for fear that the choroid may be injured and the angle not be opened. The instrument should be gently but steadily manipulated, striving to make the incision of equal depth at all points. If the iris is touched by the trephine, its spongy consistency exposes it less to injury than the harder parts. Care in following the instructions will give favorable results.

J. S. W.

Autoserum Therapy and Subconjunctival Injections.

Darier, A. (Autosérotherapie et injections sous conjonctionales. *La Clinique Ophtal.*, March, 1913), reviews the suggestions of Rohmer and comments upon the effect. Serum was removed from artificially formed blisters and injected subconjunctivally in various cases. Abscess of the cornea with hypopyon responded in three days, parenchymatous keratitis of tuberculous origin cleared up following this treatment. Cases of iritis, scrofulous keratitis, vernal conjunctivitis and sympathetic ophthalmia were all improved.

However, Darier finds that antidiphtheritic serum has proven fully as efficacious, and believes that the subconjunctival injection is the effective agent. Serum is obtained in a more scientific manner by bleeding the patient, centrifugating and drawing off the fluid. The favorable action is attributed to the formation of a special vaccine, probably specific to the patient suffering, by overcoming the microorganisms and combating their toxins.

A month after writing this article Darier had two disappointing cases, one a sclerosing keratitis and the other tuberculous interstitial keratitis. This must not nullify the interesting observations of Rohmer, but increase reports upon these lines.

Attention is called to this autoserum therapy by way of the buccal mucous membrane, in addition to subconjunctival injections of various medicaments. J. S. W.

Metastatic Cancer of the Orbit Removed by a "Curvilineal External Orbitotomy."

Genet (Cancer métastatique de l'orbite enlevé par "orbitotomie externe curviligne." *Révue Générale d'Ophtal.*, Febru-

ary, 1913) reports a case following a breast amputation in which histologic findings showed carcinoma. Patient was 55 years of age, and had exophthalmus for nineteen months, with headache, diplopia and marked conjunctival chemosis. Disc shows only swollen veins, otherwise normal. A tumor mass palpated behind and to the side of the globe. Under general anesthesia the operation described by Rollet was performed, with the following technic: "Lid sutures enclosed the eye in its conjunctival sac to prevent ulceration of the cornea and to facilitate the deep examination of the orbit. Incision made over the bony margin 3 centimeters in length. Aponeurosis is split at its concave border. Exploration with finger is easier without preliminary osteotomy, because of broken bone fragments. The tumor is then shelled out if limited and seized with a toothed forceps." Rollet has also devised two retractors which allow a view deep into the orbit. On the eighth day the chemosis had disappeared and only a sluggish suppuration retarded a complete recovery.

This method has been used thirty times in the eye clinic at Lyons, and is preferred to all other operations. It is not followed by a ptosis, no extrinsic muscles are severed. The conjunctival sac remains intact. There is sufficient space in which to work and the operation is easily performed.

J. S. W.

Radioactive Lenses—Their Action Upon the Eye and Vision.

Precerutti, Turin (Sur les verres radioactifs; leur action sur l'oeil et sur la vision. *La Clinique Ophtal.*, April, 1913). The radioactive lens is a dioptric measure which corrects refraction defects and at the same time, by incorporating radium in the silicates of the glass, gives the curative power of that element. The air space between the glass and eye is ionized and clinical experiments together with the electroscope of Professor Curie demonstrate the efficiency. (1) The activity of metabolism is augmented. (2) The nutrition of the eye is increased. (3) The curative action upon the interior of the bulb has a beneficial action upon beginning cataract, choroiditis and retinochoroiditis.

The visual power of myopes is materially benefited by easing the convergent force, and asthenopic symptoms are relieved. Hypermetropes and presbyopes who have worn this glass

affirm that they feel refreshed. External diseases which have been relieved by exposure to radium, as conjunctivitis and blepharitis, heal readily, and the prolonged treatments can be dispensed with. Of course the idea is rather new, and much more experience is necessary before drawing positive conclusions. J. S. W.

Ocular Injuries in Children.

Terrien, F., and Dantrelle, A., of the Hôpital des Enfants-Malades (Des traumatismes oculaires chez l'enfant, *Arch. d'Ophtalmologie,* Vol. XXXIII, January, 1913, p. 7), have collected 229 cases of injury in the 23,000 patients seen in about six years. This gives about 1 per cent of injuries. In children under two years the accidents are mostly due to the children falling into the fire, to frying fat spattered into the eyes, and to falls. Between two and four years the accidents are mainly due to awkward movements and falls while holding knives, forks, etc., in the hand. Up to this age the accidents occur with about the same frequency in both sexes, but from this age on about three male children are injured for every female. This is due to the dangerous pastimes and the quarrels indulged in by boys, the plays with pocketknives being especially dangerous. From the age of fifteen the accidents are the same as with adults.

While infection may take place as easily in a child as in an adult, the fact that hypopyon is rare after light corneal injuries is explained by the lack of lacrimal stenosis in children, and the absence of infecting material in the lacrimal sacs.

As to prognosis, the contused wounds are the worst, three out of six cases having been lost through panophthalmitis, the other three through iridocyclitis, and all leading to the removal or exenteration of the eye. Punctured wounds are nearly as bad, giving rise to panophthalmitis in one out of five cases, three showing iridocyclitis, and one recovering. In eight cases of incised wounds there was one resulting in panophthalmitis, two in iridocyclitis, and five in recovery.

The treatment was the same as in adults. In view of the frequent infection in these cases, it is a matter of surprise to note the absence of all reference to the use of antitoxic serum, etc., which has been used with alleged great advantage by other French authors. M. W. F.

Congenital Displacement of the Lens.

Beauvieux, Bordeaux (Etude sur les déplacements congenitaux du crystallin, *Archives d'Ophtalmologie*, January, 1913, p. 17), tells of six cases of this kind which came under his observation in the clinic of Lagrange. He uses the term "displacement" rather than subluxation, as this term does not predicate anything as to the etiology. One of the cases is given here somewhat at length, as an illustration of the others which are described in the original article.

Laborer, 22 years old, had trouble with his eyes from his earliest infancy. Born before term, it was noticed at the age of five that he was unable to distinguish even the largest letters. At the age of fourteen his family noticed the tremulous irides, and at the age of eighteen, an optical correction was prescribed by Lagrange.

The total iridodonesis, more pronounced down and out, was the most apparent anomaly. The pupils are larger than average, but the reflexes are well marked. The anterior chamber is very deep down and out; up and in the iris seems crowded against the cornea. With oblique illumination one sees the pupil divided into two unequal parts by the edge of the lens. The aphakous part is about one-fourth of the whole. With contracted pupils the patient sees equally well at a distance and near-by. After dilating the pupils with atropin, three-quarters of the pupil area are a light gray, the outer quadrant being a deep black. With direct illumination one recognizes the globular form of both lenses, which are irregular, but seem of normal volume. The inferoexternal edge of the lens, the only part visible, shows on either side two well marked indentations, possibly two rudimentary colobomata.

The lenses have been displaced in two directions: once on the vertical axis, the inferoexternal part of the lens seeming to project into the vitreous, and again on the horizontal axis, the superior part being swung forward towards the posterior surface of the iris. With the movements of the eyes the lenses are seen to tremble, showing the lack of a supporting apparatus. Two views of the fundus are obtainable: a small one through the lens, and a larger one through the aphakous part of the pupil. With the exception of a small staphyloma and a marked pigmentation of the choroid, the fundus is normal.

The patient has monocular diplopia on either eye, especially

when looking to the extreme right or left. This diplopia is homonymous, and the real image is much nearer and clearer than the false, and is also larger. Before instilling atropin the shadow test through the lens gave — 19.00 in the horizontal, and — 28.00 in the vertical meridian. After using atropin the lenticular part gave — 19.00 in the horizontal, and — 25.00 in the vertical, the aphakous part showing + 4.50. With right and left — 17.00 the vision is 1/10. The correction of the aphakous part, after atropinization, gives the same vision with + 4.00 ⊃ + 2.00 cyl.

As the patient was quite willing to submit to an operation, Lagrange did an extraction in the capsule on the right eye. Cocain was used freely to induce hypotony, the patient chloroformed, and the lens drawn out, without the slightest loss of vitreous, through an inferior keratotomy. On changing the bandage on the following day the globe was found totally collapsed, so that it resembled the stump of an eye. This collapse persisted for several days, and was caused, without doubt, by the abuse of cocain. Gradually the eye resumed its shape, but the iris was caught in the wound. On leaving the hospital his vision was 1/4 with the right eye, using + 2.00 ⊃ + 4.00 cyl. axis 165°. A year later it was the same.

Case IV shows the influence of heredity on these cases, inasmuch as two children in one family showed a double outward dislocation of both lenses. In case V the left lens fell into the anterior chamber, and was removed with good results, the patient having 1/4 vision with a + 14.00.

The microscopic study of the lenses gained by extraction does not give much light on the pathology of the lens displacement, so that Beauvieux recurs to the theory of Stellwag and Becker, that of a zonular malformation during the closing of the fetal fissure, which would explain the upward displacement of the lens, as well as the other anomalies, such as choroidal changes, colobomata, etc. The other theory accepted by Beauvieux, that of Badal and Lagrange, would make the condition an inheritance from highly myopic ancestors, in which case the lens and its suspensory ligament would be too small to fill the space allotted to them, and would therefore easily be displaced.

As to whether an operation is advisable in these cases, one has to consider the benefit to be derived therefrom. If the

patient can do his work satisfactorily, if the aphakous part is only a small part of the whole pupillary area, it is better not to subject the patient to the risks of the operation. Even when the lenses have become opaque, one should not remove them if useful vision can still be obtained through the aphakous part. When, however, the edge of the lens divides the pupil into almost equal parts, and the vision, with correction, through the aphakous part is much superior to that through the lens, one is justified in operating, as proven in the case cited at length.

M. W. F.

Autoserotherapy in Ophthalmology.

Rohmer, Nancy (De l'autosérothérapie en ophtalmologie, *Archives d'Ophtalmologie*, Vol. XXXIII, May, 1913, p. 257), while listening to a lecture on general autoserotherapy, conceived the idea of applying the principle to the infected conditions of the eye. The source of the serum was in most cases the vesicle raised by a blister applied to the patient's arm. A cubic centimeter of this fluid was injected under the patient's conjunctiva. The first case on which this was tried was that of an abscess of the cornea with hypopyon. In three days the abscess and hypopyon had diminished by one-half. A large number of eye infections with suppuration were then submitted to this therapy, and the beneficial effect was almost unvarying. In the cases of eye infection without pus formation, although the effect is not as immediate, it is undeniable, as Rohmer has proved in cases of parenchymatous keratitis, iritis, etc. The injection is painless, and the bleb disappears within a few hours. Every two days the injection may be repeated without inconvenience. If there is a pleuritic effusion of a tuberculous nature present, this fluid may be used in place of the blister serum, giving even better results; the opportunity is, as one might naturally suppose, rare to obtain this kind of fluid.

Should there be a large ball of pus in the anterior chamber, it will be necessary to allow that to escape first; the result of the keratotomy will be partial collapse of the eyeball, with cessation of pain, and much better chance for effective therapy of all kinds. On the day following the injection of the serum one sees the corneal surface begin to clean itself, and in a few days cicatrization takes place, the time varying from fifteen to fifty-four days. In three cases in which the

corneal suppuration was complicated with suppuration of the vitreous, the whole being due to the penetration of a septic metallic body, the vitreous condition was cured in two cases by five or six injections, even though it was not possible to extract the foreign body with the giant magnet; in the third case, enucleation became necessary.

In two cases of infected cataract wound, in which purulent infiltration began on the second day, the suppuration was suppressed by two injections given with an interval of two days, and the further healing was uneventful. In cases of iris contraction following lesions of the cornea, and resisting atropin, mydriasis was obtained by two injections; the same effect was noted in stubborn cases of iritis with numerous synechiæ. If the iritis has passed from the plastic to the suppurative stage, the serum therapy is eminently called for, and has cut short the suppurative process in all cases where the suppuration of the eyeball had not gone so far that enucleation had become imperative. Vernal catarrh was cured by two to four injections, shortening the usual course of several weeks to a few days. Sympathetic ophthalmia seems to be beyond the reach of the serum. He speaks very lightly of the ophthalmoreaction for tuberculosis, and says there can be no possible harm in it. In this country we have learned to look askance at this test. M. W. F.

Total Congenital Color Blindness.

Cantonnet, A. (Achromatopsie congénitale totale, *Archives d'Ophtalmologie*, Vol. XXXIII, May, 1913, p. 289), adds another case to the thirty-nine cases which Grunert had collected from literature in addition to his own five. The subject when first seen was fourteen years old, and when seen again was twenty. In the interval of six years the findings had suffered no change whatsoever. The patient had no hereditary stigmata, and was intellectually and physically normal. His parents were not blood relatives. His eyes presented no external anomaly except a slight horizontal nystagmus with a rotatory tendency. In moderate light there was no photophobia, but in strong light yellow glasses were worn, and strong sunlight was distressing. His corrected vision was 1/3, when the test types were moderately illuminated; with strong illumination the vision was markedly less. The field of vision was normal for form. Color sense totally ab-

sent. The different colors are distinguished according to their luminosity; all colors of the same shade are grouped together. No hemeralopia present. The media are all clear, and the fundus, with the exception of a slight anomaly of the vessels and an intense pigmentation, normal.

Cantonnet holds to Parinaud's theory of "an anomaly of the cone retina," the rod retina being normal. As a microscopic examination of this anomaly has not yet been possible, one is forced to theorize. The clinical import is that were we to bear this anomaly in mind and to look for it in those who present congenital anomalies of vision, we would be more likely to find it oftener, i. e., we should oftener detect subjects who are "color-blind without knowing it."

M. W. F.

ABSTRACTS FROM SPANISH OPHTHALMIC LITERATURE.

BY

WILLIAM H. CRISP, M. D.,

DENVER.

Abuse of Certain Drugs in Ocular Therapeutics.

SANZ BLANCO, Madrid (*Archivos de Oftalmologia*, December, 1912). The organic compounds of silver have not proved so efficient in the writer's hands in the treatment of severe suppurative conjunctivitis, whether gonococcic, diphtheritic (either from the diphtheria bacillus alone or in association with the streptococcus), or trachomatous. The action of these organic compounds is rather germicidal than caustic, and hence they are particularly indicated in conditions in which the bacterial invasion has not already resulted in tissue changes. Silver nitrate, on the other hand, influences the blood supply, determines the abundant extravasation of white cells by which phagocytosis is established, and hence causes the formation of a barrier to the progress of the infection, and stimulates the work of absorption. The writer does not favor the promiscuous application of the Credé method, but would limit its use (which should then be combined with other aseptic procedures) to positively suspicious cases. Used indiscriminately, the two per cent solution of nitrate of silver is capable of causing severe reaction, even of considerable duration.

Vision of Automobile Drivers.

MENACHO, M., Barcelona (*Archivos de Oftalmologia*, December, 1912). It is recommended that license to drive automobiles should be given subject to the following conditions: Representing the total normal vision of both eyes by the number 2.00, those individuals are to be considered eligible who possess a minimum total of 1.00, the vision of the worse eye not being less than 0.2. This result is to be obtained with the

charts at five meters, without optical correction, and with the eyelids completely open. Nonprofessional drivers may be allowed to obtain their requisite visual acuity by the aid of lenses not exceeding 3 D. concave or 2.5 D. convex. The certificate should not be issued to the one-eyed, to hemeralopes, to those whose monocular or binocular visual field is contracted, to those not possessing binocular vision, or to those suffering from chronic conjunctivitis of a serious character. A certificate shall cease to be effective when the driver no longer possesses the minimum total acuity of vision.

Two Cases of Hydatid Cyst of the Orbit.

Palomar de la Torre, Zaragoza (*Archivos de Oftalmologia*, January, 1913). The first patient was a woman of thirty years, who for about two months had noticed an upward displacement and bulging of her left eye. The lower lid and lower conjunctival cul-de-sac were distended by a tense, firm swelling of doubtful fluctuation. The diagnosis made was of tumor of the orbit, and enucleation was advised. The patient later submitted to operation in another clinic, when rupture of the cyst cavity indicated the correct diagnosis.

The second patient was a girl of five years. In this case also the eye was displaced upward and forward by a swelling inside the lower lid, and the physician who first had charge of the case diagnosed it as one of orbital tumor. When the case came into the writer's hands the ophthalmoscopic picture was that of moderate papillitis in the atrophic stage, and the sight was completely gone. Resemblance to the case previously described led to exploratory puncture, which resulted in the aspiration of 36 ccm. of clear fluid. It was only after a second palliative puncture that the parents consented to radical operation. Under chloroform, an incision was made through the lower lid and the cyst exposed. The cyst wall ruptured on being grasped with toothed forceps, but it was found practicable to deliver the cyst complete through the opening in the eyelid, by grasping it with the fingers and cautiously swaying the whole mass from side to side. The capacity of the cyst was found to be about 50 ccm. Healing occurred by second intention, after a period of suppuration and drainage. The eye was slightly divergent, but preserved almost all its normal range of movement.

Syphilitic Chancre of the Bulbar Conjunctiva.

Pons y Marques, Mahon (*Archivos de Oftalmologia,* January, 1913). A woman of nineteen years came complaining of pain in the right eye. There were violent inflammation and chemosis of the conjunctiva, vision was not disturbed, and there was no increase of pain on pressure. There was some enlargement of the submaxillary glands, but the patient was thought to be tuberculous. Five days later the swelling of the conjunctiva and lids was much worse, and the submaxillary glands had considerably increased in size and were tender to pressure. On everting the upper lid a rather hard ulcer was found on the upper part of the bulbar conjunctiva. Doubt was now felt as between syphilitic and tuberculous infection. Inoculation of a rabbit's eye with the exudate from the ulcer proved negative. The cornea became involved, having the appearance of an interstitial keratitis, and the cervical glands became enlarged. Intensive antisyphilitic treatment by injections of cyanid of mercury produced a rapid retrogression of all the ocular symptoms, although it did not prevent a typical secondary syphilitic eruption. It was discovered that the patient's fiancé had complained for some time of throat trouble for which he had received no medical attention, but which now proved on examination to be syphilitic.

Blepharoplasty.

Marin Amat, Manuel, Almeria (*Archivos de Oftalmologia,* February, 1913). This article, well illustrated with photographs of the patients, does not lend itself to abstract. The author states briefly the type of operation adopted and the results obtained in ten cases of lid deformity following various pathologic conditions.

Treatment of Pulsating Exophthalmus by Intravenous Injections of Gelatinized Serum.

Fernandez Balbuena, J., Gijon (*Archivos de Oftalmologia,* February, 1913). A man of twenty-five years was shot in the middle of the forehead. After some days he noticed loss of vision of the left eye, and protrusion of this eye and its lids. At examination there were exophthalmus, pulsation synchronous with the radial pulse, and a marked bruit, very distinctly

heard at the upper inner angle of the orbit. At the inner end of the superciliary ridge was a painful point which the X-ray showed to correspond to a shot hole. The optic disc was atrophic. The condition of the eye was attributed to an aneurysm located in the orbital vessels anterior to the sphenoidal fissure. The treatment first employed consisted of direct pressure on the exophthalmus, digital pressure over the carotid, and subcutaneous injections of 4 per cent gelatinized serum; twenty-one injections of 80 to 100 cc. each being given. No notable improvement being apparent at the end of three months, intravenous injections of the serum were begun. Six of these injections, at intervals of eight to ten days, were sufficient to cure the aneurysm. The first signs of coagulation in the aneurysmal sac were an increase in the exophthalmus, the appearance of chemosis and palpebral edema, pains, and marked increase in the caliber of the conjunctival vessels. These symptoms were on each occasion followed by subjective and objective diminution of the bruit, thrill, and other original symptoms. The injections were also followed by slight febrile reaction, and some of them by intense headaches. At the end of a year the cure had been maintained.

Why El Greco Painted as He Painted.

Beritens, German (*Archivos de Oftalmologia*, March, 1913). The Prado gallery at Madrid contains a number of works by the famous painter of the 16th and 17th centuries, Dominico Theotocopuli, better known as El Greco. Apart from other characteristics, the works of El Greco are strikingly peculiar in an elongation of many of the figures they contain. From a study of the Prado pictures, and of reproductions of others by the same painter, Beritens seeks to show that this distortion was due, not as some believe to a mental bias of the artist, but to a high astigmatic error. The elongation is apparently confined to the vertical direction, being especially marked in the faces, but also noticeable in other parts, such as the hands. When faces are shown oblique or prostrate, instead of vertical, the exaggeration of the vertical proportion still seems to hold, the face in these instances thus becoming rounder than when seen erect. In the works belonging to successive periods of the artist's career, Beritens traces the influence of gradually weakening accommodative

power in diminishing distinctness of detail and increasing the astigmatic distortion in favor of the vertical lines. He even ventures to transfer to certain periods of the artist's development works which by the critics have hitherto been regarded as belonging to other periods. El Greco was apparently also affected with divergent strabismus of the right eye.

Late Intervention or No Intervention in Traumatic Cataract.

Santos Fernandez, Juan, Havana (*Anales de Oftalmologia,* January, 1913). The writer believes that surgical intervention in cases of lens injury is excessively frequent. He describes two cases, one in a man of thirty-three years, and the other in a man of twenty-two years, in which extensive wounds involving the cornea and lens resulted in uncomplicated absorption of the opaque lens, a clear pupil, and good corrected vision. In the first case the final record of vision was obtained three months, and in the other instance five weeks, after the injury. The first patient had some pain eight days after the injury, but this was promptly relieved by pyramidon. Treatment was otherwise limited to the use of an occlusive bandage for some time after the injury, combined in the second case with instillations of duboisin.

Chronic Calcareous Conjunctivitis.

Arbolada, A., Bogota, Colombia (*Anales de Oftalmologia,* February, 1913). In Bogota, out of 500 cases of eye disease, systematic examination of the conjunctiva showed in twenty an affection characterized by the presence of minute calcareous bodies in the palpebral conjunctiva. These bodies occurred at the lid margins, on the tarsus, and only rarely in the culs-de-sac. They were whitish yellow in color. When numerous they produced the symptoms of foreign bodies in the conjunctiva. They were composed principally of calcium carbonate. The author distinguishes this condition from so-called conjunctival lithiasis (the bodies in which do not contain calcium salts), and also from Leber's conjunctivitis petrificans (which is especially located in the cul-de-sac and attacks the bulbar conjunctiva). The only successful treatment proved to be surgical removal. This the author did by curetment after cocainization. But relapses were the rule.

The Use of Euphthalmin in Nuclear Cataract.

Neves da Rocha, Rio Janeiro, Brazil (*Anales de Oftalmologia*, February, 1913). For cases of nuclear cataract of slow development, in which for any reason a preliminary iridectomy cannot be done, the writer prefers to dilate the pupil for optical purposes with euphthalmin, in three to five per cent solution or salve. He has never experienced any inconvenience from its use. The intraocular tension and accommodation are not affected, and no toxic effects are produced. Pupillary dilatation begins twenty minutes after instillation; and lasts about four hours after use of the three per cent solution, and about six hours after five per cent. Yellow glasses may be ordered to avoid dazzling; and, to escape the very remote danger of increased tension during the night, the drug should not be used after six p. m.

ABSTRACTS FROM ITALIAN OPHTHALMIC LITERATURE.

BY

J. Herbert Claiborne, M. D.,

New York.

On the Action of Streptothrix in the Eye, Particularly With Reference to the Keratitis of Harvesters.

Calderaro (*R Clinica Oculistica di Roma,* January-February, 1913). From the results of my clinical and experimental researches the following conclusions may be drawn:

No. 1. On the ends of the beards of grain and in the top branches of many trees, known as causative agents in hypopyon keratitis, streptothrix is frequently found during the time of harvest, and in some localities various species of this organism may be met.

No. 2. These microorganisms occur also in the healthy conjunctivæ of harvesters, and in the conjunctiva of the sound eye of individuals affected in the other eye with the keratitis of harvesters.

No. 3. In one case of keratitis, sixteen hours after the injury by the beard, I isolated a streptothrix which disappeared and was not found in the successive examinations; after the third day the presence of the pneumococcus alone was demonstrated.

No. 4. Streptothrix, in regard to its virulence in the eyes of animals, may be divided into three groups: First, to which belongs streptothrix alba; this form is the most usual met and behaves as an innocuous saprophyte; second, to which belong a few species of the streptothrix cromogena, that possess moderate virulence for the different parts of the eye; third, including the genera streptothrix cromogena and violacea, both of which are capable of producing the most serious changes in the eye that end finally in panophthalmitis.

No. 5. Experimental infection of the cornea with strepto-

thrix, virulent or not, is supplanted by infection with the pneumococcus or other pyogenic germs, that are found or have been deposited by experiment in the conjunctiva.

No. 6. The presence of virulent streptothrix in a traumatic corneal lesion produces a propitious soil for infection by pneumococcus and increases its virulence. The tips of the beards that remain in the epithelium and in the corneal parenchyma retard the cure of the smallest wound produced by this means, and prepare a most favorable soil for the development of pyogenic germs; for this reason corneal wounds that are not easily visible, received during the time of harvest, produce hypopyon keratitis.

SOCIETY PROCEEDINGS.

BY

ARTHUR J. BEDELL, M. D.,

ALBANY.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Meeting of February 17, 1913. Dr. W. O. Nance presiding.

A Case of Tubercular Keratitis.

Dr. M. H. Lebensohn reported the following case: M. H., male, 30 years old, a painter and moulder by trade, was first admitted to the Illinois Charitable Eye and Ear Infirmary, October 13, 1911, under the service of Dr. Nance, with the following history:

About three years ago he woke up one morning with a foreign body in the right eye, which was removed by a fellow workman. A few days later, the eye being red and painful, he consulted Dr. E. V. L. Brown, who made the diagnosis of tubercular keratitis. After five or six weeks the eye became quiet.

The eye did not seriously trouble him again until recently, when he complained of pain, photophobia and lacrimation. Nearly the entire cornea was covered with a grayish opacity, but in the lower half an area of from 4 to 5 millimeters was elevated about 1 millimeter. The iris markings were indistinct, pupil reacted to light, only a red fundus reflex could be discerned. Repeated von Pirquet tests were strongly positive.

His father, at the age of 38, and two sisters, one at the age of 22 and one at the age of 26, all died of pulmonary tuberculosis. His general health was good and temperature normal. He was given one injection of old tuberculin and the usual local treatment, atropin, dionin, etc. In a few weeks he was

well again, all acute symptoms subsided, and he was discharged from the infirmary.

He was readmitted to the infirmary the 20th of last month, with the eye in the same condition as it was on his first admission. In addition his lens was cataractous. His general health good, but had a rise of temperature—99.2°—in the afternoon for a few days. After the temperature remained normal three days, he was given a hypodermic injection of 4 milligrammes old tuberculin. The local and general reaction was very positive, also a marked focal reaction. The eye, which was red and much inflamed, subsided after the injection.

Discussion.—Dr. Tydings agreed as to the diagnosis in this case and emphasized the fact that the patient had a keratoconus. This he said could be controlled by the proper application of a bandage. He has used such a bandage in a number of cases for a number of years with good effect. It is a webbed elastic band with a cotton compress under it, which is left on until the cornea becomes absolutely normal.

Dr. Lebensohn, in reply to a question by Dr. Faith as to how long the tuberculin treatment was carried out, said that tuberculin had not been used therapeutically.

Dr. W. P. Coleman had a severe case of tubercular keratitis with positive tuberculin test in which he gave tuberculin for some time without benefit. The same was true of dionin and other drugs. He got the most benefit from roentgenization.

Typical Case of Acromegaly.

Dr. Joseph C. Beck exhibited a typical case of acromegaly, the patient being totally blind. The acromegaly began eight years ago, and two years later the first disturbance of vision was noticed. Within a year and a half the man was totally blind, with nystagmus and optic atrophy. Other clinical history negative.

Case of Progressive Optic Atrophy from Disease of the Hypophysis.

Dr. Beck also exhibited a case of progressive optic atrophy from disease of the hypophysis in a boy fifteen years of age. Eight years ago he was operated on for adenoids. There was then no evidence of disease of the eye. Vision was apparently normal following the operation. There has

been a loss of vision—1/100—with wide pupil, although he is able to get about and attend to his work.

Discussion.—Dr. Peter Bassoe inquired as to the development of the genitalia of the second patient. He thought the boy was rather fleshy, and suggested that it might be a case of the Fröhlich type rather than an acromegaly.

Dr. Julius Grinker referred to a case of acromegaly very much like Dr. Beck's, which he demonstrated some years ago. The patient had had the disease for fifteen or twenty years, but did not show any eye findings, blindness, or temporary hemianopsia. He could read a newspaper to the end of his days. At the autopsy he found a hypophyseal tumor as large as his fist, and the optic chiasm thinned to the thickness of tissue paper. There was an opening into the third ventricle, but no optic nerve atrophy. He thought it rather remarkable that with an optic chiasm so thin vision still continued normal. The patient also had epilepsy. He thought that in the majority of these cases a tumor could be found in the pituitary region. He did not think that an operation would be of any benefit.

Dr. Beck, replying to Dr. Bassoe, said that the boy's functions seemed to be normal. His genitalia were of normal size and development. The boy did have a tendency to adiposity.

"Commonplace Topics in Ophthalmology."

Dr. J. Elliott Colburn read a paper under the above title, in which he called attention to some of the errors made in filling prescriptions for glasses, that is, on the part of the manufacturers, and suggested that no patient should be discharged until the glasses had been checked up with the prescription, to make sure that they were absolutely right. He also called attention to the fact that patients suffering from eye trouble should have their arterial tension investigated. He reported a number of cases which illustrated to his mind the necessity and importance of such an examination.

Symposium on the Hypophysis.

Dr. J. F. Burkholder prefaced the papers of the evening by a short talk on the gross anatomy and relationships of the pituitary body, or, as it is technically called, the "hypophysis cerebri." The specimens were prepared in the Nelson Morris Memorial Institute for Medical Research.

It was assumed that all present had been graduated sufficiently long to have forgotten most of the anatomy that they had acquired at college; and on account of this universal fact, two brains were demonstrated. One specimen was that of a dog's brain, in which the circulus arteriosus (circle of Willis) was left in situ, as well as the two oculomotor nerves. The relations of the hypophysis to these two structures and also to the pedunculi cerebri, the tuber cinereum, the infundibulum, the optic chiasm, the optic tracts and the corpora albicantia were evident on inspection. The other gross specimen was that of the brain of a large bear. It will be observed that the two specimens shown were the brains of carnivorous animals. It is worth remembering that in this species of mammalia the diaphragmatis sellæ is poorly developed and can be said to form a very indifferent roof to the fossa hypophyseæ (sella turcica), and as a consequence the pituitary body is easily recovered with the brain, while the reverse is the case in all herbivora and omnivora.

Another instructive demonstration was a series of sagittal sections of the hypophysis of the sheep. These sections were stained by the contrasted Pal-Weigart process, and showed the posterior lobe or pars nervosa, the anterior lobe, and the pars intermedia of Herring, all of which could be easily seen without the aid of a glass.

Attention was also called to the arterial supply and sinus relations of the hypophysis. The pituitary body in some animals, as in the sheep, for example, is surrounded by a very dense plexus of arterioles that is formed by the breaking up of the internal carotid artery as it enters the cavernous sinus, forming what Galen called the rete mirabile; this plexus of vessels completely surrounds the hypophysis, though the systems of the opposite sides do not anastomose, thus supplying an enormous quantity of blood, which is unquestionably for secretory purposes.

Tumors of the Hypophysis and Their Relation to Acromegaly and Froehlich's Syndrome.

Dr. Dean D. Lewis discussed the pathology and symptomatology of tumors of the hypophysis, and showed a very interesting series of lantern slides on which he based his remarks.

Much of the confusion that has existed concerning the rela-

tion between lesions of the hypophysis and clinical syndromes associated with them has been due to a misinterpretation of the pathologic changes occurring in the gland. Many of the difficulties in pathologic diagnosis were due to the rather imperfect knowledge that we had at one time concerning the histology of the gland.

Most of the tumors which were found associated with the early cases of acromegaly were regarded as sarcomas. If they were sarcomas, they were destructive in character, and acromegaly should then be regarded as the result of diminished secretory activity on the part of the hypophysis. A refined histologic technic has shown that the tumor most commonly associated with acromegaly is an adenoma of the anterior lobe cells, and that in by far the greater proportion of cases the adenoma associated with this symptom complex is composed of eosinophile cells. Depending upon the stage at which the hypophysis is examined in cases of acromegaly, a hyperplasia of anterior lobe cells, an adenoma of the same or a cyst may be found. The tendency in all glands is that periods of intense activity, associated with hyperplasia or adenoma formation, is followed by regressive changes. Cyst formation represents such a regressive change in the hypophysis, and is associated with the terminal or cachectic stage of acromegaly.

Chromophore adenomas are usually associated with marked neighborhood symptoms and many of the phenomena of Fröhlich's syndrome.

Pathologically, one of the most interesting types of tumor about the hypophysis is that which develops from undifferentiated mouth epithelium. Nests of undifferentiated mouth epithelium are frequently found upon the anterior surface of the infundibulum. Tumors arising from these occupy the interpeduncular space, producing eye symptoms early by pressure upon the optic tracts. This type of tumor is the one most frequently accompanied by Fröhlich's syndrome. These tumors tend to undergo cystic degeneration and histologically correspond rather closely to adamantine epitheliomas occurring in the jaws.

Recognition of the different cellular elements occurring in the hypophysis and their relation to tumor formation simplifies the classification of tumors, and renders clear the relation which the tumors bear to the different syndromes associated with altered hypophyseal secretion.

The Evolution of the Operation on the Hypophysis.

Dr. Joseph C. Beck discussed the present status of the various operative procedures employed in the removal of tumors of the hypophysis, illustrating his remarks with lantern slides and brief review of the literature on this subject, with special reference to the ocular manifestations.

The development of the operative interference on the hypophysis dates back to the experimental work on animals, especially on cats, splitting the soft palate and entering the sphenoid from the vault of the pharynx. About the same time Fritz Koenig reported a similar procedure on the cadaver, but it remained for Sir Victor Horsley to perform the first operation on man after the suggestion of Koenig on the cadaver. This operation was by the subtemporal route (middle fossa). The extracranial methods, aside from the one suggested by Koenig, were performed by Schloffer, who turns the nose to one side and makes temporary resection of the superior maxilla to the opposite side, thus reaching the sphenoid and sella turcica, the turbinates and septum being removed. This operation was modified and improved upon, although the principles remained the same, by von Eiselsberg and Hochenegg. The return to the intracranial route, and one finding considerable favor, was that of Krause, who exposed the brain in the frontotemporal region on one side by an osteoplastic flap, elevating the frontal lobe as far as the region of the optic chiasm, the dura was then incised and the region of the infundibulum was located by an angular knife and the dura diaphragm slit, thus exposing the pituitary body. This method was soon modified by Killian, who made an osteoplastic flap exposing both frontal lobes, immediately incising the dura and retracting the brain, thus exposing the sella in the median line. The next progressive step in the operative procedure was by the extracranial method. This was by severing the nose, laying it on one side, taking the eventual blind eye so frequently present, removing the orbital contents and the internal orbital wall, including the turbinals and ethmoid cells, thus reaching the sphenoid and sella. It was Loewy's operative technic of severing the nose by making an incision below the upper lip and retracting all the structure covering the face that led to the next progress in the operation, to which Kanavel, of Chicago, contributed the first procedure, he severing the nose at the

natural alar folds and septum, turning this up and removing the septum submucously, reaching the sphenoid and thus the sella. This was soon followed by the suggestion of Halsted, using Loewy's principle of entering the nose and removing all intranasal structures before entering the sella. About the same time several men, Cushing, Hartley and others, attempted the cranial route. At this time the first rhinologist came into the arena, viz., Hirsch, of Vienna, who entered the sphenoid by the Hyack method, doing a preliminary middle turbinectomy and ethmoid curettement, thus opening the sella by specially devised instruments. This was soon followed by the modifications of West, who, in addition to this former procedure, removed a section of the posterior portion of the septum. This led to the next modification—or rather the newly developed technic of Hirsch—by making a complete resection of the septum submucously, converting both sphenoids into one large cavity, thus entering the sella. Citelli also modified the operation by only resecting the posterior portion of the septum, entering both sphenoids and following the same procedure as Hirsch.

Chiari, of Vienna, reached the sella by a procedure identical to Killian's radical operation on the sinuses, claiming more direct route and less deformity.

Recently McArthur, of Chicago, advocated a method, transfrontal—sinus and supraorbital—removing a section of bone temporarily, following very much the suggestion of Krause, and the most recent example of this operation is the modifications of Fraser, of Philadelphia, who, making a large frontal flap with the head hanging in a new position, is thus able to get a wider exposure.

In conclusion, the writer wishes to suggest an operation which he has developed on cadavers after having performed almost all the other aforesaid operations on the cadaver, believing this to be the shortest, easiest and least deforming route to the sella. It is essentially the Behrens operation of reaching the sphenoid by way of the antrum of Highmore. The detailed description and illustration of the technic of this operation, as well as the majority of the above mentioned, will appear in an original article in the near future in *Ophthalmology*.

Dr. Emory Hill read as an entrance thesis a paper entitled

"Hypophysis Disease From the Ophthalmological Standpoint, With a Report of Two Cases."

He discussed briefly the anatomy and physiology of the hypophysis, referring especially to the recent experimental work of Cushing and others establishing the classification of pituitary disorders as hyperpituitarism (gigantism and acromegaly), dyspituitarism, and hypopituitarism (Fröhlich syndrome). The first case was typical of hypopituitarism: A fair, sexually infantile boy with polyuria, presenting transient visual disturbance without ophthalmoscopic signs, and regarded as hysterical; later primary optic atrophy and temporal narrowing of the visual field and scotoma developed. Symptoms of increased intracranial pressure supervened. The X-ray showed an enlarged sella. Operation by the Kanavel method revealed a cyst which was evacuated, resulting in recovery, with some improvement of vision which has persisted for two years.

The second case represents the group called "dyspituitarism"; former pituitary oversecretion being indicated by precocious sexuality and bony growth, later undersecretion manifested by persistent subnormal temperature and increased carbohydrate tolerance. The X-ray shows some erosion and backward tilting of the sella. Temporal hemianopsia (left) and blindness (right), with primary optic atrophy and abducens paresis (right) are the eye findings. Operation is not advised, the growth probably being interpeduncular and involving the hypophysis secondarily by pressure.

The literature of the eye symptoms is reviewed, and the conclusions drawn are that temporal hemianopsia is found only in a minority of cases, many varieties of visual field limitation, with color interlacings and scotomata, being possible evidences of hypophysis disease, while exophthalmos, ocular muscle palsies, papilloedema, and secondary optic atrophy may result from pressure in the region of the hypophysis, as in other parts of the cranial cavity.

Discussion.—Dr. C. D. Wescott said that Dr. Hill's first case illustrates the trouble one gets into by not making a thorough physical examination of every eye patient and getting a complete history. There was nothing in the history of the first case when he first saw the patient which seemed to warrant a thorough physical examination. The practical recovery

of vision in the blind eye in less than two weeks seemed to confirm the diagnosis of hysteria. This was the first case of the kind he had ever seen, but it certainly had converted him to the absolute necessity of full and complete examination in every case. He suggested that it might be well for the ophthalmologist to consult with the internist, the neurologist, and the rhinologist, whenever such consultation could be made with profit, because it would save him from any pitfalls and insure better service to the patients.

Regular Meeting, March 17, 1913. Dr. Willis O. Nance, President, in the Chair.

Brown-Sequard Paralysis.

Dr. George W. Hall exhibited a case of Brown-Séquard paralysis showing ocular involvement of the sympathetic nerve. The patient gave an indefinite history of specific lesion some years ago. His trouble began suddenly on the 10th of August, 1912. While standing, about 4 o'clock in the afternoon, he suddenly became paralyzed on the left side, with complete loss of sensation. A week before he had had slight sensation in the back of the neck, which he thought was due to a cold or draught playing upon the neck. Between times there was no disturbance. For some time he had had a slight pain in the back of the neck, but this soon disappeared. He was admitted to the County Hospital August 14th, and at that time he was worse than now, having marked ptosis of the right eye with contracted pupil and a slightly sunken eyeball. Lumbar puncture disclosed an increased number of lymphocytes in the spinal fluid, with a slight reaction to the Noguchi test. He was put upon mixed treatment and showed considerable improvement. At the present time he has practically complete loss of sensation upon the right side of the face, which includes the distribution of the sensory portion of the fifth nerve without involvement of the motor portion. There is no evidence of motor disturbance, the masseters contracting equally on both sides. The right sclera shows marked anesthesia. He has complete loss of the Brown-Séquard syndrome on the left side, the loss of temperature and pain sense with the presence of tactile sense. The lesion is located in the lower cervical and first dorsal portion of the cord. It is not unusual to find this

sympathetic involvement with external lesion, that is, with tumors, and so on. The eye syndrome is connected with the process in the spinal cord, and is not due to an external condition in the sympathetic ganglia.

Discussion.—Dr. George F. Suker said it was extremely rare to have the lesion in the spinal cord proper involve the sympathetic. The rapid sinking in of the orbit and narrowing of the palpebral fissure were accentuated by the involvement of the fifth nerve. The perspiration on that side of the cheek had been markedly reduced. In looking up the literature he had not found a case of lesion of the sympathetic that presented this symptom complex. If the attack happened, as in the case of Dr. Hall, from a hemorrhage in the lower cervical and upper dorsal region, it behooves the ophthalmologist, when a patient consulted him, not to jump to the conclusion that the lesion must be in the superior sympathetic ganglion; it might be low down, and one should make a careful examination of the fifth as well as the sympathetic arising from that area.

He asked Dr. Hall whether he examined the eye grounds to determine whether there was enlargement of the retinal veins as compared with the other side.

Dr. Hall replied by saying the man's condition had improved; that the pupil was not nearly so small as it was. He had better use of the eyelids than formerly, but as to whether complete recovery would take place, it was hard to say, although he was gradually improving.

Relief of Eye Strain in High Astigmatism by the Use of a Different Axis of the Cylinder for Distance and Near.

Dr. C. C. Darling stated that of late he had seen two cases of high astigmatism in which the patients received a great deal of relief by having their cylinders set at a different axis for reading and distance.

The first case was a man, 51 years of age, who had a high mixed astigmatism. He was unable to read for more than a few minutes at a time without his eyes and head aching and print blurring. He was wearing: R. E., sph. $-1.75 \bigcirc$ cyl. $+ 4.50$ axis $120°$; L. E., sph. $- 1.50$ cyl. $\bigcirc + 5.00$ axis $60°$, with a sph. $+ 2.00$ added for reading, the distant correction giving him normal vision in each eye. He also had about a dozen prescriptions for glasses; some, he said, were about as

good as the ones he was wearing, and others he could not wear at all.

He found that his glasses were what the patient should have for distance, but when testing his eyes at the reading distance he found by trying one eye at a time he could see much better if the cylinders were rotated out 5° in the right eye and 10° in the left from the axis he had found best by monocular test for distance. These were ordered and he reported perfect comfort of his eyes for a distance and near since the change, now over eight months.

The other case Dr. Darling reported was a young lady aged 25 years, the left eye being amblyopic as a result of a convergent strabismus. She obtained 20/25 vision with a sph. + 1.00 ⊃ cyl. + 5.50, axis 115°, which he ordered. Three weeks later she returned, saying she could read only a short time with her glasses. He then tried turning the axis of her cylinder out while she looked at fine print held at the reading distance; she found this to be more comfortable and the print was also clearer. He again tried her distant vision, and she accepted the cylinder as before for distance. She reported being able to read with comfort with the special reading glass in which the cylinder was placed 10° different from her distant lens.

The amount of torsion which took place in normal eyes had been measured by different methods by many men, and tables have been given by some to show its amount when the eyes are in different positions. These vary somewhat, but Howe believes they are as constant as the measurements of accommodation, convergence or of other physiologic experiments. The amount of torsion depends upon the amount of convergence and accommodation which is exerted, and also on the position of the plane in which the visual axes lie.

Discussion.—Dr. H. W. Woodruff asked if it was a monocular or binocular test for torsion.

Dr. W. Franklin Coleman said he had followed the ophthalmic literature since 1870, and had seen nothing written on the subject except a paper that he read before the Chicago Ophthalmological and Otological Society, February 8, 1887. He purposed to review here only two cases by way of illustration. His own experience in most cases shows that the refractive error, unlike Dr. Darling's cases, was quite moderate; although recently he had a case of 15 D. of myopia with 3½ D. cyl.,

which in one eye at least, if not both, speaking from memory, the axis of the glass for reading differed 30° from that accepted in distant vision.

In 1883 a patient, aged 37, asthenopic, showed under homatropin, right eye + 36 axis 75° = 20/20. Under accommodation the right accepted — 36 axis 180°. The patient reads best with + 36 axis 75°, which relieved all the symptoms. This axis varies 15° from the axis of the + glass accepted under accommodation.

The second case, aged 37, November, 1883, could read only half of a column of a newspaper without severe eye pain. Under homatropin the cylinder accepted was + 36 axis 15° right eye. Under accommodation — 48 axis 120°. The left eye + 36 axis 165° under homatropin and — 48 axis 60°. This axis for reading distance in the right eye varies 30° from the glass for distant vision under accommodation. The left eye varies 15° from the distance glass under homatropin.

In prescribing the strength and axis of a cylinder he has always followed Burnett's advice in his book, to give the one accepted by the patient under accommodation.

Another case from memory is that of a lady, the mother of an oculist. He has prescribed cylinders for reading at a different axis from the distance glasses. Having lost her glasses, she was examined twenty years after by two oculists without satisfactory results, when he was written to for the prescription which gave the relief required.

In attempting to account for the reason of the acceptance in reading of a different axis, we might suppose that the ciliary muscle acted in convergence in certain meridian. As Dobrorowski proved, it is possible to compensate for or to change the axis of the corneal astigmatism, but since the changed axis in reading usually corresponds more nearly with the axis of the distant glass accepted under accommodation, it is more likely that the change is due to the rotation of the eye on its anteroposterior axis; that is to say, if the nasal end of the horizontal meridian is moved downwards in reading, it would be due to the action or overaction of the superior oblique muscle. On the other hand, if the nasal end of the meridian is moved upwards, it would be due to the overaction of the inferior oblique.

In conclusion, we should all test the reading vision under

glasses of all our patients, and if it is not satisfactory as compared with distant vision, we should rotate the cylinder to the most acceptable axis for reading.

In answer to a question asked by the president, of how many cases the speaker has seen, he would say conservatively from memory, at least a dozen; but the majority of these patients he saw in his earlier practice, and he is afraid that he has not found more since for the simple reason that he with his confreres would not see what they did not look for and too often failed to look for.

Dr. Darling, in reply to Dr. Woodruff, said he tested one eye at a time at the near point. After the cycloplegic had worn off, a few days later he could find the axis cylinder for distance, and the patient could read and often took a different axis for reading. In the other case the doctor did not give the different axis for distance and reading, but made a postcycloplegic test, and in place of making a monocular test he tested both eyes for distance at the same time, and found the patient felt easier if he took a different axis on monocular test, correcting the cyclophoria, and not torsion. The amount of torsion ordinarily for reading distance is 1½ or 2°. When a man converges and looks up, he averages about 15° of torsion. If he looks up, there is a difference of 15° between the vertical meridian and axis of it than if he were looking straight ahead.

Syphilis of the Eye and Its Appendages.

Dr. Alfred Murray discussed the variations in the ocular manifestations of hereditary and acquired syphilis, his remarks being illustrated by numerous stereopticon slides showing cases of parenchymatous keratitis, the fundus changes of congenital syphilis, and Hutchinson's teeth, the incisors, canines, and molars being mostly involved. Pictures of cases of interstitial keratitis, disseminated choroiditis, chancre of the lid, chancre of the lid margin, gumma of the sclera, syphilitic iritis, with the ordinary symptoms showing synechiæ usually developing in the second stage, condyloma of the iris, gumma of the iris located at the ciliary margin, neuroretinitis, choked disc, etc.

Syphilis of the Central Nervous System.

Dr. Geo. W. Hall, president of the Chicago Neurological Society, by invitation, read a paper on "Syphilis of the Central

Nervous System," with special reference to (a) spinal fluid, (b) reflexes, (c) ocular manifestations, (d) early diagnosis of parasyphilitic disease. Illustrated with stereopticon.

He referred to a case he presented before the Chicago Neurological Society about two years ago. The patient presented the Brown-Séquard syndrome, the same as the patient shown tonight. That patient also showed an involvement of the cervical sympathetic, due to a central lesion in the spinal cord, and not to peripheral nerve involvement.

Within the past few months he has had the privilege of observing two cases of cervical rib in which there was involvement of the cervical sympathetic nerves. One case was operated upon by Dr. Kanavel, and showed a similar involvement to the patient exhibited tonight, affecting the sympathetic on the right side, caused by pressure of the cervical rib. Since the operation the pupil has almost regained its normal size, and the narrowing of the palpebral fissure has disappeared and the patient is rapidly improving. The other case, one of Dr. Gill's, operated on by Carl Davis, had a narrowing of the pupil, with a slight narrowing of the palpebral fissure, and a paresis of the vocal cord upon the affected side.

Dr. Hall, after showing several slides of cases bearing on syphilis of the nervous system, spoke briefly on the early points in the diagnosis of brain syphilis. He said that ptosis or involvement of the third nerve is found early in cases of brain syphilis, as the optic nerve and the third nerve are especially involved in syphilitic gummatous meningitis. When one sees such involvement of the third nerve or perhaps of the sixth, coming on suddenly in adults, the first thing he thinks about is syphilis. In addition to that there may be general symptoms of tumor, such as nocturnal headaches, vomiting, dizziness, diplopia, etc., which accompany the presence of gumma in the brain. If, in addition to the ocular involvement and other symptoms of which the patient may complain, there is an increased number of lymphocytes in the cerebrospinal fluid, as determined by lumbar puncture, with the presence of globulin, with or without a specific history, we think immediately of the possibility of cerebrospinal syphilis. We do not expect to find the Argyll-Robertson pupil in brain syphilis, although it may occur.

One of the early symptoms of tabes is a disturbance of the

tactile sense across the chest, in the region of the nipples, and perhaps extending along the ulnar portion of the arms. The pathology of the disease, beginning as it does in the posterior root ganglion and extending into the dorsal columns of the cord, would explain the reasons for the early symptoms of tabes being sensory in character, such as bladder symptoms, lancinating pains, frequency of urination or slight dribbling of the urine early in the disease. The loss of knee-jerk, for the same reason, occurs early in cases of tabes. Another important sign is the socalled invisible ptosis, showing a transverse wrinkling of the frontalis muscle. The eye symptoms are early symptoms of tabes. In the absence of the Argyll-Robertson pupil, there are three other conditions to be observed: first, the irregularity of the pupil; second, the inequality of the pupil, and, third, a pupil reacting sluggishly to light. In an adult with a specific history, showing such a condition of the pupil, and with a history of periodical attacks of vomiting, gastric crises, we may think of an early tabes. Such symptoms, with loss of knee-jerk, or with a band of hyperesthesia across the chest, such as we have mentioned, would speak strongly for the presence of tabes. Optic atrophy may be one of the early symptoms observed by the ophthalmologist. We could mention a great many such combinations which would lead to a diagnosis of tabes, and which we very frequently see in our clinical work. Occasionally we get a complete internal ophthalmoplegia, but this is comparatively rare.

The diagnosis of general paresis sometimes depends on early eye symptoms. The Argyll-Robertson pupil may be one of the first things to attract our attention in the diagnosis of paretic dementia. We find normal or increased knee-jerks in cases of general paresis, unless we have a taboparalysis to deal with. If a patient shows increased irritability, as described by his wife, and has a tendency to loss of memory for business engagements, carelessness or peculiarity about his dress, associated with irregular, unequal and sluggish pupil, perhaps with exaggerated knee-jerks, with or without a specific history in previous years, it would cause us to think very strongly of its being a case of paretic dementia. If, in making the lumbar puncture, we find an increased number of lymphocytes in the spinal fluid, it would not be difficult to make such a diagnosis.

The Present Situation in Syphilis.

Dr. William Allen Pusey (by invitation) referred to the development of the arsenical chemotherapy, begun by Uhlenhuth, and carried forward so amazingly by Ehrlich by the introduction of salvarsan in 1909, and said that these fundamental discoveries constituted an epoch in the history of syphilis and produced a complete recasting of the methods of its management.

The great additions which had been made to the management of syphilis were: 1. Diagnosis by demonstration of the spirocheta pallida. 2. Diagnosis by the Wassermann reaction. 3. The use of the Wassermann reaction as a criterion of the effect of treatment. 4. Diagnosis by Noguchi's cutaneous reaction. 5. Prophylaxis by inunction of 33 per cent calomel ointment within a few hours after infection. 6. Treatment by salvarsan and its derivatives.

The man who had to do with the treatment of syphilis had never had a greater responsibility put upon him than existed in the question of the use of salvarsan in the treatment of his cases of syphilis. The claims for it had been so strong and the sponsors for it of such high authority, that it has been no easy task to exercise restraint in giving one's patients the supposed benefits of it; and yet there were many considerations which made one hesitate at its administration in the heroic way which had been advocated, and which raised serious questions concerning the sum total of its usefulness.

Salvarsan had proved less toxic than the organic arsenic compounds of which it was the successor; but it must be immediately said it had not been found the safe remedy that it was hoped to be. It had not proved to be wholly parasitotropic and free from dangerous organitropic and neurotropic qualities, to use more of the terms for which we were indebted to Ehrlich. On the contrary, it had been shown again that arsenic was still treacherous and that, combine it as we may, it was, when used in quantity, still dangerous. The minor disturbances from its use—fever, nausea, vomiting, diarrhea, prostration, headache, low blood pressure, temporary cardiac disturbances, transitory albuminuria and the like—may be dismissed with brief courtesy. Some of them are important as suggesting contraindications to the drug, but they are of no practical importance in so serious a problem as the cure of syphilis.

There could be no two opinions as to the specific action of salvarsan upon the active lesions of syphilis. It was a powerful symptomatic remedy. In rapidity of action it surpassed mercury or mercury and iodids in many lesions; in others, it equaled or was inferior to these older remedies. In early syphilis it had a very quick effect upon the initial lesion, mucous patches and condylomata. Its action was quick upon mucous membrane lesions generally. Its effect upon the cutaneous eruptions was not more prompt and not more complete than that of mercury.

The abortive action of salvarsan in the primary period gave it a very valuable field of usefulness. About forty per cent of the cases of initial lesion, which could be distinguished by the demonstration of the spirocheta pallida, showed a negative Wassermann for one to two weeks after the appearance of the lesions. In these cases there was a reasonable prospect that syphilis could be aborted, which justified a vigorous attempt with salvarsan. This made the early diagnosis of the initial lesion a matter of great importance.

After giving a very exhaustive review of the literature, Dr. Pusey summarized as follows: 1. Salvarsan has real dangers; they are remote, but when they occur, serious. 2. As far as can be deducted from our present knowledge, there is no reason to believe that salvarsan will lessen the occurrence of parasyphilitic nervous affections, and some ground for fear that it may predispose to them, except in those cases in which it cures the disease. 3. It is a powerful symptomatic remedy. 4. In cases in which vigorous treatment is begun before the generalization of the disease, there is strong ground for believing that syphilis can be aborted. This possibly applies to a few early cases with secondaries. 5. In all other cases in the secondary period its curative use likely does more harm than good.

Discussion.—Dr. William E. Gamble said that during the last fifty years there have been gradually accumulated by the successive generations of ophthalmic surgeons definite clinical pictures in the inside of the eye which we know to be the result of syphilis, such as the plastic iritis with the yellowish nodules near the pupillary border, the fine sand-like hyalitis in young people in secondary syphilis, the diffuse retinitis and choroiditis seen in the later stages of secondary syphilis, and in inher-

ited syphilis the chorioretinitis that we see in the periphery of the fundus. It has been by these and other clinical pictures that obscure cases of syphilis have been diagnosticated.

Ophthalmologists are frequently called upon to examine the fundus oculi of patients before using salvarsan and make a report of the findings to the physician in charge. If these physicians would ask us to make a study of the fundus afterward, facts would be accumulated that would help us to solve this very important question. In the treatment of syphilis of the eye, salvarsan has not displaced mercury, for where mercury and iodid of potassium fail, it fails. He referred especially to interstitial keratitis. The more or less real danger of arsenical poisoning resulting in damage to nerve tissue, and the added danger of intravenous injections, make many of us feel that the old methods of treatment of syphilis are in the main more safe and probably more reliable, except in the first few days after infection.

Wesley Hamilton Peck,
Secretary.

OPHTHALMIC SECTION.

ST. LOUIS MEDICAL SOCIETY,

Meeting of March 5, 1913.

Implantation of Glass Ball in Tenon's Capsule. (Frost-Lang Operation.)

Dr. John Greer, Jr.: This patient, a little girl, came to the Children's Hospital about a month ago. She is, as you see, a victim of ophthalmia neonatorum. In the right eye the lower portion of the iris is engaged in a corneal scar. There is an anterior polar cataract. The left eye was distended and sightless and painful at times, so I decided to enucleate it. I thought it best to insert a solid sphere into Tenon's capsule, because, as we know, after simple enucleation in children there is apt to be failure of development of the bony structures of the orbit. I hope that the implantation of the solid sphere may prevent this secondary failure of osseous development. Dr. Greenwood, of Boston, has done this operation in about seventy-five cases, and it was on his recommendation that I first undertook it. The technic is exactly as Dr. Greenwood outlined it to me. The conjunctiva is incised in the usual way, each rectus tendon is caught up by a Prince's advancement forceps, the conjunctiva is well separated from the muscle, and the muscle from the globe. A silk suture is then passed through each rectus tendon. The eyeball is very carefully enucleated and all bleeding checked. That is a very important point. A purse string catgut suture is then put around the edge of Tenon's capsule. An assistant places the glass ball (about the size of a small marble) in the cavity, holds it in with gauze, and the purse string suture is tied. The glass eye is now completely covered and the rest of the operation consists simply in tying the external to the internal rectus and the superior to the inferior and then taking three or four interrupted sutures to approximate the conjunctiva. The reaction after the operation varies very greatly. In one of my cases there was tremendous swelling and pain, controlled in the course of forty-eight hours by cold applications. In the others the reaction has been no

greater than what usually follows a simple enucleation. This operation was performed only thirteen days ago. You will notice that there is much less sinking in of the upper eyelid than is the case after simple enucleation. The rotations of the prothesis are better than after simple enucleation in the lateral direction, but not in the vertical direction. The child has only worn an artificial eye for a day, so we may hope that the cosmetic result will eventually be better than at present.

Heisrath's Excision of the Tarsus.

Dr. John Green, Jr.: The second patient is a boy on whom I have performed the Heisrath excision of the tarsus. He has been treated at the various eye clinics for trachoma for the past four or five years with only temporary improvement. He was just entering the cicatricial stage. No pannus. Last summer my first experience with this operation was an encouraging one. A young woman came to me with a very bad trachoma of seven or eight years' standing, extensive pannus and ulceration; in a word, the usual picture of a badly neglected trachoma. I excised the tarsus in both eyes, and in six weeks all the ulcers had healed, the pannus had cleared up, vision had greatly improved, and at last reports, five months after the operation, there were no signs of inflammation in the eyes. This operation is gaining a great deal of favor in New York. Dr. Woolton and Dr. Claiborne are ardent champions of this procedure. The first man in this country to speak of it and to advocate it with favor was Dr. Casey Wood, of Chicago. I suppose you are all familiar with the technic of the operation. The lid is everted and these forceps applied (designed by a nurse at the New York Eye and Ear Infirmary). Another forceps designed by Dr. Claiborne may serve a bit better. The tarsus is clamped at its lower edge and the lid lifted up, thus displaying the superior fornix. The incision is made along the upper edge of the tarsus, and goes through the conjunctiva. The conjunctiva is then dissected backward towards the fornix and a little on to the globe, and three double armed sutures are inserted. The clamp is removed. For the second part of the operation I use Dr. Ewing's excellent lid forceps. The second incision cuts through the tarsus from the outer to the inner angle, 3 mm. back from the ciliary border. The aim is to make the ends of this incision curve around and meet the ends of the

first incision. For the freeing of the tarsus I use a thin knife, rounded at the end. The lid is replaced in normal position, the position of the sutures is carefully noted in order that they may be brought out through the skin of the lid at a point opposite to the point of insertion. I have followed Claiborne's suggestion and brought out the stitches through the skin of the lid, rather than through the anterior remnant of tarsus, as advised by Heisrath and other operators.

Discussion.—Dr. Weiner: I have never seen any advantage in introducing an artificial globe, either glass or metal. I see a great many objections. It is rather early to remark upon this case, as the operation was recent and there is still quite a bit of swelling, but it appears to me that there is very much less excursion in any direction of this eye than in an eye where an evisceration has been done or an enucleation. And in an eye where evisceration has been done and the muscles are intact and in place in the sclera, it seems to me that there is not any more sinking in of the socket or of the upper lid than in this case, especially with a reform eye. Then besides, I think the patient is infinitely safer without anything introduced into the orbit.

In the second case I do not see any special advantage gained in removing the tarsus, and I think it is a mistake to remove it. There are very few cases that do not respond to local treatment, and I think I would rather have it take longer and have a better ultimate result, than remove the tarsus immediately.

Dr. Charles: About the first case, the thing I like is that the operation is especially adaptable to children, because it would probably stimulate growth of the orbit, giving it a chance to develop, which it might not perhaps have otherwise. I would like to know if anybody has seen these glass balls after several years? Would they become rough in the course of time? Some of the constituents of glass (for example, sodium) are soluble.

As to the second operation, it seems to me it is especially applicable in those rare cases where other treatment does not seem to avail. We, all of us, have an occasional case with greatly thickened tarsus which suffers relapse after relapse, just as we believe that it is about well.

Dr. Jennings: I have had some experience in the use of glass globes, but on account of the reported danger of rough-

ing after a series of years, the last ones I have used were made of gold. I agree with Dr. Wiener, that if an evisceration is done you get a very movable, satisfactory stump. When I make my incision I pull the muscle forward and tie it to the conjunctiva on that side. Of course, I believe that after every enucleation the muscles should be attached to the front portion of the stump, and not be allowed to fall back.

In regard to the second case, it seems to me that the removal of the tarsus would be of benefit in those chronic forms of trachoma with entropin, but I should not care to remove it as long as the case was progressing nicely, and there was no particular amount of entropin.

Dr. Green, in closing: I know nothing about the erosion of implanted glass balls. Have you had any experience with them actually coming out? (Dr. Jennings replied no.)

Dr. Sweet, of Philadelphia, recently reported a series of cases in which he had done the Frost-Lang operation, using metal (platinum and gold) balls. He followed up his cases carefully to determine, if possible, any bearing the operation might have on the subsequent development of sympathetic irritation or inflammation, and was able to satisfy himself that no such relationship existed. The present case is perhaps not a fair test of the operation. The motility of the globes is and has been defective since birth. (Recall that the patient has been practically blind all her life.) We must remember, too, that the operation was done only thirteen days ago and the child has been wearing the glass eye only one day. No doubt the cosmetic effect would be better when the prothesis has been worn longer. In one of Dr. Greenwood's cases, the cosmetic result was so perfect that one could not tell at a distance of few feet which was the natural and which was the artificial eye. There seems to be quite a difference of opinion as to the degree of motility after these operations. Dr. Sweet, in his series, found that the motility was distinctly greater in all directions than after a simple enucleation.

In regard to Heisrath's operation. This operation has been performed by Dr. Kuhnt, of Koenigsburg, more extensively than by any other surgeon. When first taking up his work in a trachoma infected district, he found that many patients who came originally to his clinic would soon drift away, and on seeking an explanation for these deflections, he found that

his patients were going to another clinic to have the tarsus removed, and they were quickly relieved of all symptoms. He was therefore practically driven to perform this operation as a means of saving the prestige of his clinic. It seems to be the consensus of opinion of those who have performed this operation most frequently, that there is a very positive indication for it. The case presented had been under treatment for several years, had been subjected to several operations, and in spite of all presented all the earmarks of a progressive trachoma.

Hyalitis Caused by (a) Pus Absorption and by (b) Intestinal Autointoxication.

Dr. J. W. Charles: The first case had been relieved of an optic papilloedema and paresis of the third nerve on the left side by a complete emptying of the ethmoidal and sphenoidal sinuses, in the spring of 1911. In October of 1912, the patient came with vision almost normal O. D. (19/15), numerous punctations on the membrane of Descemet, distinct haziness of the vitreous, veins large, but no lesion visible. She was placed in the hospital of Washington University, where Dr. Albert E. Taussig, on examination, found her physical condition normal, urine and feces normal, Wassermann negative, and blood culture negative. Tuberculin subcutaneously not feasible on account of heightened temperature (von Pirquet, dubious in 1911). Blood count yielded a leucocytosis, the white cells ranging from 10,580 to 12,640, chiefly affecting the polynuclear neutrophiles, the lymphocytes and other cells being always normal in proportion. A suppurating sphenoidal sinus was finally found on November 3rd, but drainage did not relieve the hyperpyrexia. After resting at home for six weeks the patient was much improved, with no headache, normal temperature, but with the hyalitis still persisting.

The second case was seen in 1911, after vision had failed in right eye for several months. O. D. V. = 19/38, O. S. 19/12. Muddy vitreous on right side. Dr. H. W. Soper found the following: Patient had been operated for appendicitis one year ago. Has lost fifteen pounds in three months. Abdomen distended. Epigastrium tender. Urinalysis (twenty-four hours) 2000 cc., specific gravity 1018, yellow acid, albumin faint trace, nucleo; no serum, sugar, or bile; large amount

indican; no casts, blood or pus; few leucocytes. Feces acid, dark brown, 150 g., well formed. Many large clumps of mucus, no blood visible, no occult blood. Stomach contents, after test breakfast, 30 cc. yellowish liquid, chyme fairly good, considerable excess of stomach mucus. Free HCl 50, total acidity 70. A diagnosis of catarrhal bronchitis, gastritis hyperacidica, and general autointoxication was made. Condition improved under strictly purin-free diet, and eye now sees 19/24 to 19/15. Patient is taking $HgCl_2$ gr. 1/12 to 1/6 t. i. d. Wassermann and von Pirquet were negative. No discussion.

A Case of Bitemporal Hemianopsia and Presentation of Patient.

Dr. Julius H. Gross: Spiller, in Posey and Spiller, on the question of tumors of the pituitary body, states: "Tumors of the pituitary body not infrequently cause bitemporal hemianopsia, which later may give place to blindness. Choked discs may be associated with tumor of this part of the brain, but not infrequently the optic neuritis is of a mild grade, or there may be optic atrophy from the pressure on the chiasm, without previous neuritis. Polyuria and polydipsia, even diabetes mellitus, have been observed as signs of such a growth. Acromegaly has been found so frequently in cases in which the pituitary body was enlarged, that some relation between this disease and the alteration of the pituitary body probably exists. Sufficient cases, however, have been reported to show that tumor of the pituitary body does not always cause acromegaly. Bitemporal hemianopsia is a common sign of acromegaly. Bitemporal hemianopsia can be caused only by a lesion at the chiasm."

Mrs. W., aged 64 years, came to the O'Fallon Eye Clinic about six years ago with the following history: About two years ago, while out walking with some friends, she noticed that objects appeared double, and that she could see only one-half of the object. She consulted a prominent oculist, who treated her for some time; the diplopia left, but her fields did not improve. At that time her vision was: O. D., 10/120; O. S., 18/19. The vision in the temporal sides of both fields, excepting a small portion adjacent to the center of the field, was gone. The papillæ were a grayish white, the vessels of normal size, very much as they now appear. Not any swelling. There is nothing in the patient's past ailments

having any connection with her present trouble, except that goiter came on at the age of 19. Present condition: The patient feels well. Has normal appetite. Sleeps well, perhaps a little more than would be considered normal at her age. She has excessive thirst. Perspires easily on left side of face and body. The general physical examination shows that she still has goiter; the left lobe especially is large, although she states that it is much smaller than formerly. The left knee is stiff: an old trouble which has not any connection with the present ailment. There is present a fair percentage of sugar in the urine.

Condition of eyes: O. D., vision nil; O. S., vision 18/19. The temporal side of field, except a small part near the fixation point, is dark. There is interlacing of the red and green color fields. The pupils respond when light is thrown on the seeing part of the left retina. Wernicke reflex sign present. The pupils contract in accommodation. Movement of the globes is normal.

The bitemporal hemianopsia would point to some trouble in the anterior part of the optic commissure, in the region of the sella turcica and pituitary body. Signs and symptoms usually present in tumor of the pituitary body and absent in this case are: headache, nausea and vomiting, convulsions, vertigo, choked disc and acromegaly.

Discussion.—Dr. J. F. Shoemaker: Dr. Gross's patient was seen by me in September, 1906. She had at that time complete bitemporal hemianopsia, and stated that the trouble had begun about a year previously. When I first saw her the vision was 18/24 in the right eye and 18/19 in the left, unimproved with lenses. Mercury, potassium iodid and strychnin were tried, but did not improve the condition. She was later referred to the clinic at the O'Fallon Dispensary. Several years later I had an X-ray taken of her head, which failed to show any evidence of pituitary involvement, the sella turcica appearing entirely normal. Diseases of the pituitary body may cause different symptoms, depending upon whether the secretion of the gland is increased or decreased. When there is hypersecretion, the body growth is likely to be excessively stimulated, causing gigantism in the young, and acromegaly in the adult. When the secretion is much diminished, there is likely to be a rapid accumulation of fat and a stunting of the growth

of the body, particularly of the sexual organs in the young, and in adults causes atrophy of the ovaries and testes, resulting in cessation of the menstrual flow in women and impotence in men. The bitemporal hemianopsia in this case made me suspect a growth involving the pituitary body, but she had none of the symptoms of pituitary disease except the hemianopsia. It is of course possible to have a tumor in this region which does not involve the pituitary body, but which, nevertheless, presses on the optic chiasm. Exception must be taken to the statement that bitemporal hemianopsia can be caused only by disease of the optic chiasm. A growth in front of the chiasm between the optic nerves could so press against the inner sides of the nerves, without touching the chiasm, as to produce the same ocular symptoms as if the pressure were against the front part of the chiasm. At least one case of this kind has been reported.

Dr. Wiener: I have some interesting charts of bitemporal hemianopsia. The first patient presented himself for treatment early in January, 1911; when he came complaining of dimness of vision, the eyes being sensitive to light and suffering seemingly rather an acute condition. We found his vision to be 1/100 in the left and 1/300 in the right. His field showed an almost complete bitemporal hemianopsia. This was taken on the 21st of January, 1911. This patient was treated by Dr. Wolfner and myself and was given a small dose of atoxyl; on February 24th, more than one month later, the fields were again taken and showed a marked increase in size, while his vision had increased to 14/80 in the right eye, and then on April 29, 1912, the last time we saw him in the office, the fields were taken again and they were found to be almost normal, as here shown. His vision was 14/50.

The second patient came to the Eye Clinic of the Washington University; his fields were taken on the 8th of January, this year, and showed a bitemporal hemianopsia. This patient was referred to the surgical department, an X-ray was taken and a diagnosis of pituitary tumor was made and a decompression operation was done through the nasal route. These are the fields taken at the hospital. The patient shows marked improvement.

Dr. Gross, in closing: I would only like to say that Dr. Shoemaker's criticism should have been directed at Dr. Spiller,

as it was Dr. Spiller's statement, taken from Posey and Spiller's book, "The Eye and the Nervous System," that "bitemporal hemianopsia can be caused only by a lesion at the chiasm."

A Protractor for Use With the Single Cell Trial Frame.

Dr. A. E. Ewing presented a protractor for use with the single cell trial frame, which consists of two circles made up of short radiating lines of different lengths to represent the one, five and ten divisions of the circle. The proximal ends of the five and ten degree divisions rest on an imaginary circle which is the size of the outer edge of the 38 mm. ring of the trial lens, while the distal ends of the degree divisions rest on the inner edge of the mounting. For further accuracy in centering the mounting across vertical and horizontal lines, each 10 mm. long, is placed at the center of each of the circles. The circles are placed 21 mm. apart with their horizontal meridians in the same line, and at their upper margin a horizontal dotted line is drawn tangential to both circles. The circles are designated by "R" for right and "L" for left, the latter corresponding to the left eye and the former to the right eye, as the lenses are worn by the patients.

To employ the diagram with the single cell trial frame, it is only necessary to place the cylinder of the right eye over the right circle, with the edge of the trial lens of the left eye against the tangent of the left circle, and note the position of the usual short marginal guide line, which indicates the axis of the lens, in degree on the circle. For the left eye the lens is placed over the left circle with the edge of the right lens against the tangent of the right circle, and the position of the left lens is similarly noted in degrees. This diagram is printed on the prescription blank for the glasses in order to have it always at hand and ready for use. It has proved to be a rapid, correct and satisfactory method for noting the axis of the cylinder when writing the record of the case, and for indicating it with a pen or pencil mark on a diagram for the use of the optician, as it plots the axis of the cylinder or the prism precisely as it is to be worn by the patient.

The conventional angular notation generally adopted in the graduation of circles, as used by Donders, and still in common use by probably the majority of ophthalmologists and opticians, has been retained. As only the 180 degrees are necessary for

establishing the axis, the numbers are duplicated in the lower half of the circle in order to facilitate the reading.

Discussion.—Dr. Luedde: I recall some of the incidents connected with the making of planoconvex and planoconcave trial lenses with special rings to enable the use of two lenses in a single cell frame, referred to by Dr. Ewing in his discussion preceding the presentation of this prescription blank protractor. The first case made in this way by the American Optical Company was made for me. Its manufacture was the result of a personal visit of Dr. John Green, Sr., at the American Optical Company's plant at Southbridge, Massachusetts. Dr. Green selected the material for the rings, which were made according to his own diagrams. He further ordered the grinding of the higher lenses in smaller intervals, and extended the series, both in sphericals and cylindricals, beyond the limits of cases of this type made in former years by Wall & Ochs. (The latter firm gave up their manufacture because it was not appreciated by the trade and unprofitable). The case was delivered in March, 1908. This very convenient form of trial lens, which can be secured easily, we owe to the efforts of Dr. John Green. It is a matter of surprise to those who know these cases from personal experience that any one tries to get along with any other type. The abiiity to place a cylindrical and a spherical lens in a single cell in a way that reproduces, almost perfectly, the single final lens called for by the patient's error of refraction, is an advantage not to be overlooked in difficult cases.

Most of the advantages of the chart submitted to be used in specifying the axis of cylinders are, I believe, contained in this one which I have been using for two years. In addition, I have provided for the designation of the meridian according to any of three systems in general use, by having two sets of numbers in separate rings at the circumference. First accustomed to the designation of meridians beginning with zero at the horizontal and continuing around to 180°, I have later adhered to the use of the vertical meridian for the standard of comparison, as seems natural in the consideration of corneal astigmatism. My own preference is the method devised by Dr. Green, almost fifty years ago, by which the meridians to the right are indicated by the + sign before the numeral, and those to the left are distinguished by the — sign. There is in my experience no confusion with the + and — signs of lenses in

this method. However, on my chart the letters N and T, printed on either side at the top, permit the use of the terms nasal or temporal to designate on which side of the vertical the axis should be placed. To determine the axis of a trial lens in a frame, I have always found the large flat protractor used by Dr. M. H. Post for many years more accurate than any small disc, and equally convenient.

PHILADELPHIA POLYCLINIC OPHTHALMIC SOCIETY.

Meeting of March 13, 1913. Dr. Wendell Reber in the chair.

Retrobulbar Neuritis of Nasal Origin

Dr. H. Winfield Boehringer reported a case of retrobulbar neuritis of nasal origin in a woman, 45 years of age, with a family history studded with tuberculosis. Eight years ago was in bed seven weeks with neurasthenia. Two years ago had two posteclamptic convulsions, and for several days vision was misty in both eyes. She was up on the sixth day. Four weeks ago patient had mild attack of grippe and was in bed for two days. This was followed in about a week by a bad coryza. A few days later she reported with sudden blindness, in her right eye. Vision = 20/200, with reduced central fields and 20/20 vision in the left. Complained of pain over the right side of her head, especially the eyeball, which was sharp and severe when percussing over the frontal sinus, more so on palpating the eye at the outer sclerocorneal junction; but at no other point. Sudden movement of the eye, especially upward, caused great pain. Pupils were small and reacted to light and accommodation. The media was clear, fundus details were negative except as to slight tortuosity of the vessels, the veins somewhat dark and full, and a slight paleness of the temporal side of both discs. On taking the fields a large central scotoma was found, but no concentric contraction of the form or color field.

The nasal mucosa was found engorged with no hypertrophy of the turbinates. Posterior examination and transillumination were negative as to the sinuses. Patient refused an X-ray. Vision varied as follows: first day 20/200, second day 10/200, third day fingers at 1 foot, fourth day fingers at 4 feet, fifth day fingers at 6 feet, sixth day fingers at 12 feet, which I found equalled 20/200. Next day, after working hard, vision dropped to fingers at 6 feet. Did not see patient for three days, and then vision was found to be 20/75. Vision is still intermittent and foggy, and she describes letters being flashed on and off

as by electricity and somewhat luminous. Vision was found to be better on black card than on white.

The diagnosis of retrobulbar neuritis was made on the signs above noted. Treatment: nasal spray of four per cent cocain and adrenalin 1/5000, four times a day; sodium salicylate grains ten every three hours; atropin 1/200 grain every hour for two days.

Papillitis of Doubtful Origin.

Dr. Luther C. Peter reported the following case: Mr. M. T., an Italian, aged 45 years, always enjoyed good health until January last, when he developed severe pain in the right eye, which disappeared in three days. In the middle of February it developed in the left eye, but disappeared before consultation. Vision in right eye is limited to faint light perception, and in left eye 20/30 partly. Pupil of O. D. is moderately dilated, responds feebly to light and accommodation. Consensual contraction is present in the right eye when the left eye is exposed, but not vice versa. O. D. proptosed about 2 mm.

Ophthalmoscopic examination shows in the right eye a round pupil, clear media, disc very hazy in outline, grayish white in color, the cribriform membrane obscured by exudate, veins overfilled, tortuous and lost here and there in retinal haze and edema, arteries contracted with considerable perivasculitis, especially on the disc. Marked retinal striation and edema which extends some distance beyond the disc edge, but no hemorrhages are visible; above the disc several small white areas, probably the remains of old hemorrhages, and much elevation of the disc.

The left eye shows more edema, the veins more engorged, arteries somewhat narrow in size, the disc not so pale, the process less marked than in the right eye.

Ophthalmic diagnosis: Papillitis in receding or atrophic stage in the right eye, and an earlier, more active stage in the left. Neurologic examination negative. Nasal examination negative. There is, however, an enlargement of the sella turcica. Wassermann test of the blood was also negative, but no test made of the cerebrospinal fluid.

Treatment consisted of daily hot packs, preceded by pilocarpin hypodermatically, unguentum hydrarg., one dram twice daily by skin, and on Dr. Reber's suggestion the nasal passages

were packed daily with 25 per cent argyrol solution for twenty minutes. Since the institution of active treatment, vision has improved from 20/70 to 20/20 partly. Improvement may be due, however, to a recession of the edema in the left eye, which may or may not have been influenced by the treatment.

Diagnosis in this case is difficult, as the report of both the rhinologist and roentgenologist are negative so far as sinuses are concerned. Systemic disease of the central nerves can be ruled out because of total absence of corroborative symptoms. Tobacco, alcohol and lead can also be eliminated as etiologic factors. Tumor of the brain, other than syphilitic, has little corroborative evidence.

By exclusion, disease of the pituitary body and syphilis remain to be considered. Against syphilis is the negative Wassermann from the blood test of this patient. However, it is not unusual to find the blood test negative and the cerebrospinal test positive in late nervous syphilis. In favor of the diagnosis is, first, the initial lesion; second, the tolerance of mercury; third, the improvement under the use of mercury; fourth, the perivasculitis noticeable in the edema; fifth, the sudden development of the papillitis.

The question of a decompression operation was discussed, and Dr. Peter felt that there could not much good come of such an operation at this time.

Discussion.—Dr. Reber: I don't think we have had a case here in the last four or five years that has interested me more than this case of Dr. Peters'.

I don't know whether he was treated for syphilis or not, but he presents a negative Wassermann. In certain cases of this type a specimen should be taken from the cerebrospinal fluid. We have also a negative neurologic and rhinologic report in this case. My attitude toward the rhinologic report is that I usually insist that the case be treated on rhinologic grounds, if I think there is any chance of the trouble being due to the sinuses; and the case generally gets better. I have come to the belief that only prolonged rhinologic study of these cases is worth while at all. Fuchs' present position is that the rhinologist should be obliged to operate if the ocular symptoms indicate it.

I don't know yet just how much importance the X-ray plays in the diagnosis of these cases, for there certainly are varia-

tions in size in the normal pituitary body. This man recovered more quickly than I ever saw a syphilitic optic neuritis do. The visual fields are against disease of the pituitary body in this case. There is no denying that we may be dealing with a bizarre syphilitic process.

In Dr. Boehringer's patient the diagnosis rested between hysteria and retrobulbar neuritis. What she tells us about her blindness is absolutely correct. She had some manner of sinus disease. I don't think there is a doubt of that—with the edema of the lid, the history of the case, the grippe, the peculiar type of pain, the tenderness over the frontal sinus and the reduction in vision. If she had had these things without pain it might have been hysteria. I agree with Dr. Posey when he says he wonders we don't oftener see these ocular conditions in connection with nasal disease. I also agree unreservedly with what he has said in regard to the enlargement of the blind spot. I have had cases of optic nerve disease in my office that did not show any enlargement of the blind spot. On the other hand, I have secured most valuable information by this method in certain doubtful cases.

The lesson that stands out from these three cases is the necessity of bearing in mind always the possibility of the nasal origin in obscure ocular disease, and the imperative necessity of a skiagraph in all obscure forms of optic nerve disease.

Dr. Peter: As to enlargement of the blind spot, I have been making a number of experiments and have not been able to satisfy myself that there is any enlargement of the blind spot in these cases unless there is a very marked change in the optic nerve.

I just want to call attention for a moment to Dr. Boehringer's case. It is typical of sinus disease. Central scotoma coming and going, due to an increased pressure within the sinuses themselves, and not an inflammation extending along the vascular sinuses, is suggestive always. There is a distinct relation between turbinal disease and eye conditions.

The Muscular Anomalies of the Eye Due to Sinus Disease.

Dr. William Campbell Posey: By reason of the juxtaposition of some of the eye muscles with the walls of the orbit, and the very close association of the nerves which supply them with the sphenoid cavity, as they pass along the outer wall of this

sinus, paresis, and even paralysis of one or more of the eye muscles, may occur as a consequence of sinusitis. While complete paralysis demands an inflammatory process of considerable intensity, and is usually occasioned by a cellulitis of the apex of the orbit secondary to either an active sphenoiditis or ethmoiditis, or more rarely to antral disease, paretic conditions of the muscles may complicate comparatively mild cases of sinusitis, and may occur when the rhinologic examination reveals only a congestion of the mucous membrane lining the cavity.

Chronic empyemas of the sinuses rarely occasion marked muscular insufficiencies unless signs of active inflammation arise, for the distention of the walls of the sinus under such conditions is gradual and the displacement of the globe which follows is so slow that the muscles have an opportunity to adjust themselves to the changed conditions of the visual axes under which they are forced to operate. In acute cases the paresis is occasioned either by direct inflammatory infiltration of the long, broad, flat belly of the muscles themselves as they lie in association with the walls of the sinus, or by an involvment of the nerves supplying them as they enter the orbit. As in many of these cases the function of the muscle is but slightly interfered with, diplopia is but rarely complained of, and can be detected only by careful search in the peripheral field by the aid of a colored glass. Under such circumstances the diagnosis may often be facilitated by requesting the patient to indicate in which direction movement of the eyes is especially painful, as considerable distress is often excited when the eyes are rotated into the position in which fullest demand is made on the affected muscle.

As a consequence of this paretic condition of the muscles, vision is often blurred, and while, as just stated, many of the palsies are not sufficiently marked to induce diplopia, when the eyes make their ordinary excursions the imbalance created is sufficient to confuse vision, to cause vertigo, to excite reflex gastric symptoms and to render the near use of the eyes difficult. By reason of their anatomic relationships, paralysis of the levator, of the superior rectus and the superior oblique muscles, serves to indicate a probable involvement of the frontal cells; paralysis of the internal rectus, an involvement of the ethmoidal; and paralysis of the inferior rectus or inferior

oblique muscles, an inflammation of the antral cells. As sphenoiditis may, however, implicate any or all of the nerves supplying these muscles, the value of differentiating the precise muscle affected, as a localizing symptom indicating the involvement of any particular sinus, is not great. Diplopia in the periphery of the field does not always indicate that a muscle has been paralyzed, for it may be induced by a slight displacement of the globe, either by exudation or by the distended wall of a sinus.

Ptosis from paralysis must not be mistaken for dropping of the lid from edema. This differentiation is not always easy, for, as in all other signs and symptoms of sinusitis, both the edema and the palsy may be transient and may disappear only to reappear after several hours or days, or even longer intervals.

He is of the opinion that if many of the cases of palsy of extraocular muscles attributed to rheumatism were analyzed, an affection of a sinus would be found to be the underlying cause in many instances. Such palsies may appear after "catching cold," and are associated with more or less pain on moving the eye, and possess other characteristics which suggest the presence of an acute sinusitis.

Thrombosis of the Central Retinal Vein Secondary to Nasal Disturbance.

Dr. Wendell Reber reported the case of a colored man, aged 45, who came into the service at the Samaritan Hospital about four years ago. Had been in perfect health for twenty-five to thirty years at least. Within two or three days he developed blindness in the right eye, vision being only 20/200. Had been examined by his medical attendant, who found nothing wrong.

In going over him we found a typical picture of obstructive disease of the central vein, the condition corresponding to that which used to be called apoplexy of the retina. He had some pain in moving the eye, but no pain on pressure, and no ciliary tenderness and no inhibition of the eye in any of the meridians. Had X-ray made and very careful rhinologic examination. Both negative. The general medical attendant reported his blood pressure to be 150 systolic and 10 or 15 degrees less diastolic. Practically normal pressure for his time of life.

The urinalysis normal and the blood normal; in fact, the man was in very good condition. The rhinologic report was doubtful, but I am no longer disturbed by a negative rhinologic report in the diagnosis of nasal disease. Nasal disease will sweep in and do its damage and disappear by the time the ocular damage becomes apparent. In this man there was a negative Wassermann and von Pirquet. I insisted, however, that the rhinologist follow up the case, and after rhinologic treatment of nineteen to twenty days he regained vision. There is a slight change in his right optic nerve head, but he still holds on to his 20/30 vision. This was accomplished inside of four weeks, without any other treatment whatsoever. I feel that here is a case in which we have shown that the trouble was due to latent sinus disease.

I am perfectly willing to put myself on record as believing that a goodly number of cases of thrombosis of the central veins have in fact been due to latent obscure undiagnosed sinus disease. If there is one thing that to my mind is more important than anything else in the present-day study of obstructive disease in the retinal vessels, it is latent obscure nasal disease; but this latent condition need not be purulent. From this fetish we hope the medical world will soon be delivered. It is apt to occur in the eye on the same side as the sinus disease.

Within eight weeks of the time the above case was seen, another colored man presented himself in our same service with thrombosis of the right central vein. The coagulation time of his blood was abnormally short. He ultimately regained vision of 5/9 under long continual small doses of sodium iodid (3 to 5 grains t. i. d.).

Discussion.—Dr. Posey: By reason of the intimate association of the optic nerve with the sphenoid bone, and, as Onodi has shown, in many cases with the posterior cells of the ethmoid, this nerve is more or less implicated in the majority of active inflammatory conditions of these cavities. Indeed, were it not for the double layer of periosteum which covers the bone forming the barrier between the nerve and the sinus, and for the protection afforded by its sheath, it would be difficult to comprehend how this nerve could escape implication in any affection of the sinus, for the separating

layer of bone is frequently as thin as paper and contains many dehiscences.

The involvement of the optic nerve, as a consequence of ethmoidal or sphenoidal sinusitis, may vary in degree from a simple edema to an active retrobulbar inflammation. While this latter inflammation is rare, even in cases of marked sinusitis, edematous infiltration is common, although as the change wrought in the nerve is but slight, the symptoms which it excites are not striking; they must be searched for with some care. As a rule, the patient complains of some dimness of vision in one eye, at times of vertigo, headache and other head symptoms. When the ophthalmoscope is employed, the unaffected eye is usually found to be normal, while in the fellow eye a slight veiling of the edges of the nerve is seen, with a dilatation of the retinal veins and a choking of the lymphatics around the central vessels. If the sinusitis is unchecked and retention of the contents of the cavity occurs, the nerve becomes more involved and the familiar signs of a retrobulbar inflammation of the nerve appear.

In cases of even slight involvement of the optic nerve, the patient is usually conscious of a dimness in the affected eye, although if the vision be tested in the ordinary manner, it will be found to be equally good in each eye; in other words, that the vision for form is normal. If the light on the chart be reduced, however, or if Bjerrum's test card is employed, the difference in vision between the two eyes will be at once manifest, and it will be ascertained that the dimness in the affected eye was occasioned by a diminution in the light sense, as a consequence of the edematous infiltration of the highly organized bundle of fibers which supply the macular region.

The extent of the involvement of the nerve may be further studied by the perimeter, by means of which it will often be possible to differentiate relative central and paracentral scotoma, and at times a concentric contraction of the field. If the congestion of the nerve progresses to inflammation and the conducting power of its fibers is further interfered with, then more positive defects in the visual field will appear, and it will be possible to outline absolute scotoma, both central and paracentral, and peripheral contractions in the field, in accordance with the location and the degree of involvement of the nerve.

Enlargement of the physiologic blind spot has been much dwelt upon by some authorities, as of diagnostic value in such cases; but the facts as to the limits of the normal blind spot are not yet sufficiently defined to make sure any diagnostic conclusions we would like to draw.

D. Forrest Harbridge,
Secretary.

WILLS HOSPITAL OPHTHALMIC SOCIETY.

Meeting of March 4, 1913. Dr. William Zentmayer, chairman.

The X-Ray as an Aid in the Diagnosis of Diseases of the Eye.

Dr. Henry K. Pancoast, by invitation, summarized the subject of the X-ray diagnosis in connection with diseases of the eye and orbit, for convenience, in the following manner:

1. The diagnosis of tumors in the region of the optic chiasm and affecting the pituitary or posterior sinuses. The diagnosis must depend upon bony changes, either absorption by pressure or direct involvement, or the distorting effects of pressure. In the case of sinuses, it may also depend upon shadows obliterating the normal translucency.

2. The detection of tumors of the orbit or anterior sinuses depends upon similar bony changes or shadows obliterating the normal translucency of the sinuses.

3. In tumors involving other portions of the cranial cavity the diagnosis can be made in only a comparatively small percentage of cases, and must depend upon pressure effects upon the bone or the results of pressure on the venous channels, except in rare instances in which a growth has become more or less calcified.

4. In disease of the posterior sinuses the diagnosis of posterior ethmoid disease must depend almost entirely upon the lateral stereoscopic view, and in sphenoid disease the postero-anterior view is also essential in order to determine unilateral or bilateral diseases especially. Oblique views and views from above downward may be of assistance. The diagnosis is far more difficult than in anterior sinus disease.

5. Disease of the anterior sinuses is comparatively easy to determine, and is uniformly reliable and needs no special mention.

6. Bone disease of the orbit or sinuses can be determined by the appearance of bony destruction or new bone formation.

A clinical knowledge of the case is always essential for best results.

Discussion.—Dr. Posey expressed his appreciation of the aid the X-rays may give the ophthalmologist in the diagnosis

of obscure conditions in the orbit and neighboring sinuses, but referred particularly to their value in the lesions affecting the chiasm. The technic had improved so greatly in recent months in operation upon that region, that ophthalmologists should avail themselves of every means to insure a correct diagnosis in this class of cases, for it was probable that early operation would in many cases prevent blindness later. He had been disappointed in the vague character of the report which he had obtained from the X-rayologist in many chiasmal conditions, but believed that when the visual fields were being more and more compromised, operation should be essayed, even if there were no definite positive shadows.

Dr. Zentmayer said that because of the obscurity of the pathogenesis of pigmentary retinitis, he had Dr. Leonard make a radiograph of a recent case seen at the Polyclinic, with a view of determining whether there were any changes indicating disease in the pituitary body. They did show some enlargement of the sella turcica, and the boy was consequently placed upon thyroid extract, but it is too recent to expect any results.

In a case of suspected intraorbital tumor, Dr. Manges made a radiograph which showed a depression of the roof of the orbit, which he concluded was the result either of an anatomic condition or of a tumor in the anterior lobe of the brain. Later choked disc appeared in the fellow eye. An operation was done for the purpose of exenterating the orbit, but no primary growth was found. There was apparently an invasion of the orbit from the brain. At the same time the sphenoidal cells, which were also involved, were curetted by a rhinologist. Immediately after the operation the patient developed hyperpyrexia and died within seven hours of the operation. No autopsy was obtained.

Gonorrheal Metastatic Keratitis.

Dr. Irvine F. P. Turner, by invitation, presented the case of a colored man, aged 22 years, who applied to him for treatment on January 13, 1913, complaining of an inflamed and painful eye. The condition had persisted for one month, and was similar to an attack six months previous. The patient has suffered from an attack of gonorrhea in June, 1912, but aside from this he had always been in good health. Family

history was negative. Upon examination of the right eye the cornea showed numerous circumscribed areas of infiltration around the periphery, and in the center a diffuse superficial punctate keratitis, grayish white in appearance. There was a slight ciliary flush, but the iris was not involved. Vision, — 6/12. The von Pirquet and Wassermann reactions were negative, as was also the bacteriologic examination of the conjunctival secretions. Under appropriate treatment the ciliary irritation subsided, but the corneal condition remained unchanged.

Discussion.—Dr. Posey said that he had seen but two cases due to metastatic gonorrhea. The first occurred in a young man who had acquired gonorrhea shortly after the ocular inflammation appeared. Gonococci were found in the urethral secretion and also in a smear taken from the inflamed cornea. There had been no arthritic inflammation or acute conjunctival inflammation. The keratitis was vesicular in type. The second case occurred in association with an attack of conjunctivitis and iritis of metastatic gonorrheal origin in a young man the subject of multiple arthritis and took the form of a superficial punctate keratitis.

Dr. Posey cited the monograph of Byers and said that this author had reported nine cases of corneal disease which were probably metastatic in nature. Of these, the substantia propria of the cornea was affected in two instances; in five the inflammation was confined to the epithelial structures. In all seven cases the ulceration affected the central portion of the cornea. Both eyes are usually affected, though in a series of twelve cases, five were unilateral. Dr. Posey expressed himself as still unconvinced of the definite value of antigonorrheal bacterins and sera in the treatment of this class of cases.

Trichiasis Cured by the Spencer-Watson Operation.

Dr. William Campbell Posey exhibited a case of trichiasis cured by the Spencer-Watson operation. The case was one of old trachoma, but as the tarsus had been but little affected, Dr. Posey had chosen the method of procedure mentioned in the title, in preference to the Hotz or other operation, which included an incision of the tarsus as a necessary step in the technic. Dr. Posey said that he had performed the Spencer-Watson operation in several cases, and preferred the simple

and ingenious transplantation of the ciliary border which it effected to any other manner of removing the irritating row of hair follicles.

Magnet Extraction of a Foreign Body From the Orbit.

Dr. Posey exhibited a case in which he had successfully removed a fragment of steel from the apex of the orbit by means of the magnet. The foreign body had passed through the nasal portion of the eye, the point of entrance being 5 mm. from the limbus, that of exit some 10 mm. more posteriorly, and had lodged in the sheath of the nerve some 5 mm. behind the globe. Removal of the foreign body was attended with some difficulty, division of the internal rectus muscle being necessitated before the fragment of steel could be disengaged from Tenon's capsule. Healing had been prompt, and notwithstanding the disintegration of the coats of the eye to the nasal side, which had been occasioned by the passage of the foreign body, vision equaled 5/9.

Optic Atrophy Following Traumatism.

Dr. Frank C. Parker presented a patient who had applied at the Wills Hospital on January 25, 1913, for treatment following the loss of vision in the left eye subsequent to an injury two months prior. While walking along the railroad he was struck by a train which threw him heavily upon his right hip, at the same time striking his shoulder and head at the outer upper orbital rim with such force that he was rendered unconscious. This comatose state lasted three days. In the meantime, six stitches were taken in the skin covering the orbital injury.

Upon regaining consciousness at the termination of three days, the patient could not detect the light of a candle held directly before his left eye. Frequent tests for light perception were made by the physician in charge, but not until after the fourth day following the injury could the patient detect light. Vision then gradually improved, until two weeks later objects could be dimly seen, and, according to the patient's statements, he thinks there has been continued improvement.

At the time of the injury there was bleeding at the ears, nose and mouth. External examination showed a well marked scar over the upper outer orbital rim. The corneæ are clear,

the pupils 2½ mm. in size, the right eye reacting promptly to light, accommodation and convergence, while the pupillary reaction in the left eye is absent, save for a consensual reaction, which is prompt. Ocular movements in all directions are good.

Ophthalmoscopic examination showed the right fundus to be normal, but in the left there was a well defined simple optic atrophy. The visual fields showed a marked contraction in the left eye.

From the nature of the bleeding, with its associated bleeding from the ears, nose and mouth, and the accompanying unconsciousness, there was present undoubtedly a fracture of the skull. As the consensual reaction of the pupil of the affected eye was not interfered with, the lesion causing pressure upon the optic nerve must necessarily have been anterior to the decussation of the fibers in the chiasm. Consequently, it would be safe to assume as the causative factor in the production of this optic atrophy a fracture of the orbital walls near the apex, producing direct pressure upon the nerve at the optic foramen, or a hemorrhage or extravasation, or both. From the fact that vision improved somewhat, the absorption of an extravasation or hemorrhage would account for this, but as the nerve shows a decided atrophy, there would be every reason to assume pressure upon the optic nerve by a fragment of bone as it passes through the optic foramen.

Dr. Posey drew attention to the necessity of conservation in prognosis after monocular loss of vision following head injuries, as in many cases, such as the one just cited, there was no actual break in the continuity of the optic nerve fibers, their function being depressed only for a time in consequence of the pressure of blood or inflammatory exudate. Sudden and complete blindness usually indicates severance of the nerve, loss of sight coming on gradually, and some time after the accident being the more favorable condition.

Dr. Zentmayer said that many theories had been advanced to explain the frequency with which periorbital blows were followed by optic atrophy, but about twenty years ago a series of experiments were made which showed that the resultant of the forces was in a line that led to fracture at the foramen opticum. Dr. Zentmayer asked Dr. Pancoast whether a radiograph would be able to show this in a living subject.

Meeting of April 7, 1913. Dr. S. Lewis Ziegler, Chairman.

Tuberculous Keratitis.

Dr. Samuel D. Risley presented two cases of keratitis which had proved rebellious to all the usual methods of treatment at his own and other clinics. He called attention to the fact that in each case the pupils had not dilated under repeated instillations of atropin; that there had been excessive photophobia, notwithstanding the fact that the corneal epithelium was intact. There was deep ciliary injection and tenderness to palpation, which he regarded as suggesting a general uveal disease. There were also several small gray, nearly circular islets or nests of infection, showing a dense center and a fainter gray border or halo; these were apparently situated on the membrane of Descemet, or between it and the stroma of the cornea. This peculiar distribution, together with general ill health of the patients, suggested to him a probable tubercular infection. The von Pirquet test was positive in both; in one case, the reaction being so marked that it suggested the early stage of a vaccination and was accompanied by a rise of temperature. There was no pulmonary involvement demonstrable. Tuberculin injections were then instituted, resulting in a rapid and marked improvement in the ocular conditions.

Discussion.—Dr. Posey thought Dr. Risley's case was typical of a tubercular keratitis. He said that in his experience the projection of a tongue-like area of yellowish white infiltrate from the limbus into the interstitial lamellæ of the cornea towards its center, and the occurrence of discrete yellowish white oval areas, which appear caseous and avascular, is very significant of tubercular keratitis, while he had observed the deposition of small rounded areas resembling drops of cold mutton fat upon the posterior surface of the cornea or in the lamellæ of the cornea, secondary to tubercle of the iris and of the deeper parts of the eye. According to Michel, the typical picture of tubercular interstitial keratitis is almost always preceded by the formation of tubercular nodules in the pectinate ligament, the corneal involvement appearing secondarily. Bach, however, is of the opinion that tubercular nodules may be found primarily in the periphery of the cornea.

The treatment of tubercular keratitis is, as might be supposed, often unsatisfactory. Expectant measures are usually the safest and wisest, though the employment of tuberculin has often been of undoubted value. The observations of Gamble and Brown of Chicago; of von Hipple of Goettigen, and of many others, attest this. Von Hipple insists upon the propriety of small doses (a beginning one of 1/500 milligram), as in a few cases 1/50 milligram has produced marked local reaction. In his opinion, subconjunctival injections should be discountenanced, and old tuberculin, to confirm the diagnosis before beginning the treatment with tuberculin T. R., is recommended. Under the tuberculin treatment, von Hipple has found that the general health of the patients improved in almost all cases; enlargement of the spleen and lymph glands disappearing, and the body weight increasing.

Dr. Burton Chance said that he had been impressed by the remark that the patients had shown decided improvement in their general health almost from the very start in the courses of the tuberculin treatment. He believes it has been the experience of all ophthalmologists who have administered tuberculin sera, to find long before the ocular symptoms had begun to regress that the patients gained in weight and showed many evidences of improved nutrition.

He recalled a case of his own in a lady who had had inflamed eyes from her early childhood, to such an extent that the cornea of one eye is entirely leucomatous, while the other eye shows several nebulæ. At the time she came under his observation, about two years ago, there were the symptoms of profound anemia and emaciation. It was the opinion of others concerned in her case that there were no signs of pulmonary disease, and he himself believed that the patient's glandular system chiefly was involved. During the first course of tuberculin injections, not only were the corneal symptoms allayed, though not cured, but enlarged cervical and submaxillary glands became softer and reduced in size, while the patient's weight rapidly increased.

In the discussion on the results of tuberculin in chronic ambulatory tuberculosis, at the College of Physicians, toward the end of last year, the remarks of the chairman were of particular interest. Dr. de Schweinitz said while the gen-

eral practitioner could not accord this form of treatment the place it was hoped at first it might attain, the ophthalmologists could attest to the great value of this therapeutic agent in tuberculous lesions of the eye, because it had been amply demonstrated that such lesions have yielded more readily to tuberculin than they had under other and older measures. Therefore, the ophthalmologists have the opportunity to render a valuable contribution to the subject of tuberculosis, and this contribution ought to have the respect of those occupied in this very important branch of medicine.

Some Interesting Cataract Cases.

Dr. Burton Chance presented three cases of congenital cataract which have been under observation in Dr. Schwenk's clinic in the past month. The first was of a vigorous man of 22 years, in whose left lens were fine punctate opacities in the anterior cortex, and in the posterior cortex at the pole was a rather large opacity, shell shaped, within the serrated edges of which were well defined granules. The vitreous was perfectly clear and the fundus healthy. The visual acuity equaled 6/22 by special tests, but in practical experience the sight was worse because the opacity obscured the pupillary space. The sight had been poor for a long time, yet without any known cause. He had been told several years ago that he had a cataract in his left eye. For three or four years the man has been a pugilist, but he declared his sight was poor prior to his boxing bouts.

The second case was that of a young Swiss cloth finisher, of 23 years, who had been myopic all his life, but had recently lost his sight so that he could not work. His eyes were widely divergent. There was, of course, perception and projection, but it was not possible to obtain the exact visual acuity. In the posterior cortex of the right lens was a well marked stellate opacity, extending far out in all diameters, through the points of which the unusually well preserved fundus, for so great a degree of myopia, could be seen. The left lens contained more diffused opacities, which were less dense than in the right. The special point about this case was the development of cataracts in what might be considered to be an intense or malignant myopia. It is Dr. Schwenk's inten-

tion to remove the lenses with the prospect of reducing the myopia.

The third case presented in each eye a small dense disc in the posterior cortex directly at the axis; that of the right was almost the size of a pin head, and that of the left about 4 mm. The smaller was quite dense; the other had a granular edge or border. In the anterior cortices were numerous fine vacuoles. The eyes in other respects were healthy. Vision: Right, 6/45; Left, 4/45. The man is a baker, aged 40 years. He believes his sight was good until two years ago, when on recovering from heat prostration he noticed a marked reduction in each eye. He began to use glasses only a few months ago. In complete mydriasis the visual acuity is almost normal.

Discussion.—Dr. Risley said that posterior capsular opacities of the lens were one of the most annoying problems for the ophthalmic surgeon. In his own practice he had not seen any satisfactory improvement in vision from iridectomy for visual purposes. His procedure of late years had been a preliminary iridectomy, to be followed in due time by a vertical slit in the capsule without cutting into the lens cortex. Two days later the lens was extracted. He had pursued this method in six cases during the past year at the Wills Hospital and one in private practice. In only one of these was there any reason to think that the delay of forty-eight hours between the capsulotomy and extraction was too long because of swelling of the lens cortex. In one instance, instead of extraction after the usual corneal section, the soft lens was evacuated by expression, the section being made by a keratome, the point of which was carried into the substance of the lens, then slowly withdrawn and slight pressure backward made with the blade and the soft masses of cortex allowed to escape over the inclined front surface of the keratome. This procedure, of course left the opaque posterior capsule undisturbed and required a subsequent capsulotomy.

He thought, however, that any method for the management of posterior polar or capsular cataracts was incomplete which left out of consideration the fact that they were the result of more or less serious uveal disease, often associated with systemic affections; or, as in one of the cases presented at this meeting, that of the blacksmith, due to exposure to heat

or light at the furnace or forge. These conditions should be subjected to treatment before any operative procedure is undertaken.

Posterior Congenital Cataract.

Dr. McChney Radcliffe reported a case of congenital posterior capsular cataract with a triangular shaped opacity in each eye, the centers of the triangles being comparatively clear. The patient had compound hypermetropic astigamtism, and with proper correction his vision was 20/20 partly. He is a college student and is able to do his work with comparative comfort. His father is said to have congenital hexagonal cataracts with 4/7 normal vision.

Triangular Congenital Cataract.

Dr. George S. Crampton referred to a case of triangular congenital cataract which he exhibited elsewhere two years ago. It was afterwards discovered that this nine-year-old boy was the son of deafmutes who were not blood relatives. In the center of each lens there was a circular, film-like cataract about 6 mm. in diameter, composed apparently of very minutes dots. These formed a symmetrical triangle, base up, within the circular area, the stippling becoming so attenuated towards the center that through it practically 6/6 vision was obtained with glasses to correct the slight amount of compound hyperopic astigmatism. The uncorrected vision was 6/9 and 6/12 in right and left eye, respectively. The eyes of his mother and sister were free from cataracts, and all other members of the family were said to have good eyes, although as they lived a distance they could not be examined

Spontaneous Absorption of a Cataractous Lens.

Dr. William Zentmayer presented the case of a male, aged 40 years, who had been operated upon by him three years ago for cataract in the right eye. At that time there was a hypermature cataract in the left eye. This was not interfered with because the eye was strongly convergent and light projection was faulty. The operated eye secured a vision of 6/12. He states that the sight of the left eye has been improved of late, whereas that of the right eye has failed. He recalls having received a slight blow on the left brow just previous to the

time when improvement began in the left eye. In the right eye there is a regular coloboma, clear pupil and a detachment of the retina below. In the left eye there is an apron of capsule floating in the upper half of the pupillary space. The remainder of the pupil is clear. No trace of the lens. Vision in each eye equals counting fingers at about 1 m.

J. Milton Griscom,
Secretary.

BOOK REVIEWS.

Prisms, Their Use and Equivalents.

By James Thorington, M. D. Published by P. Blakiston's Son & Co., Philadelphia. 1913.

The value of a work on prisms by an author of Dr. Thorington's standing requires no comment. In such an excellent work it would be difficult to point out parts of greatest value, but we would call special attention to the tables showing the equivalence of centrads, prism diopters and refracting angle, also those for decentering the lenses and for obtaining the effect of two prisms with their bases at right angles. The book is profusely illustrated with plain and colored cuts.

C. L.

Ophthalmic Semiology and Diagnosis.

By Charles H. Beard, M. D., in An International System of Ophthalmic Practice. Edited by Walter M. Pyle, M. D. Published by P. Blakiston's Son & Co., Philadelphia. Price, $4.00.

This is a volume of 400 pages, with 13 colored plates and 71 figures in the text. The plan of the work is, first, a description of the different symptoms of disease manifested by the eye, and then a discussion of the diseases in which such symptoms are found. It has always been the opinion of the reviewer that the method of ophthalmic instruction, and, for that matter, medical instruction, is all wrong. The student is told the disease and then the symptoms are described. But in actual practice he meets symptoms and from them must reconstruct the disease. It is for this reason that clinical instruction is so much more interesting to the student than didactic. We welcome this work to our library as a step in the right direction, and heartily recommend it. C. L.

Hole in the Disc.

Dr. Carl Williams.

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XXI.

DISCUSSION OF OCULAR COMFORT AND ITS RELATION TO GLARE FROM REFLECTING SURFACES.

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AND

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Probably every member of the audience, as well as the reading public in general, has experienced, knowingly or unknowingly, the unpleasant effects due to disturbance of the visual function, and the decrease of ocular comfort and efficiency, caused by the glare from the reading surface of books, magazines and stationery. Very few of such readers realize why certain books and magazines are read with comfort or discomfort, or can really sense to the full extent the amount and character of the discomfort, or the magnitude of the harmful effects which may arise, or are arising, from this generally unappreciated yet enormously important and active factor.

If the glare is bad enough and the reader has an inherent or acquired knowledge of the advantage of tilting the book or changing the angle of incidence of the light, he will, if his position allows it, rid himself of the specular component of the glare, but he does not necessarily eliminate the entire

cause working against his visual efficiency, because there may still remain the diffuse form of glare, due to overillumination and other causes, and also the many other factors still present and combining to produce uncomfortable reading. By eliminating the most apparent component he has, therefore, placed himself in a psychologic state in which he does not realize the still harmful effects of the remaining factors, and possibly, therefore, without his realization, is continually subjecting himself to the untoward results of an unrealized danger.

While the layman, during his reading or close use of the eyes in the conduct of his daily work, is not fully able to analyze or appreciate the seriousness of the situation, experts in all the sciences and arts which contribute the harmful factors have recently been spending much time and energy in the analysis of the conditions, and are, in their various fields, studying the effects and remedies and emphasizing them to the fullest extent by publicly calling attention to them.

Some of the factors in the production of the ocular discomfort resulting from close use of the eyes on paper and other reading and writing surfaces are: the intensity, character and color of the illumination upon the working surface; the composition, tint and surface of the paper; the style and size of the type; the color and luster of the ink; the spacing between letters, words and lines; the length of the printed or written line; and the character of the illustrations.

To bring about any concerted action in this matter, therefore, requires the cooperation of the ophthalmologist, the illuminating engineer, the paper manufacturer, the typographer, the publisher, and the lithographer—all in their broadest terms. More to be desired than any of these, however, is the cooperation of the public, for by its realization of the situation and the resultant demands for proper combination of the various elements will be added the greatest possible impetus to the movement.

For example, the present lamentable condition is largely due to a misguided popular demand upon the illuminating engineer, printer, publisher, illustrator, and lithographer for more and more glare and brilliancy of illumination and more and more highly glazed and gaudy published product—the artistic results of which the populace think they like, but which could

not often on mature judgment be called even in good taste. Thus the potency of popular demand for good, or for evil, may be illustrated, and the effort should now be made to reverse the travel of this huge pendulum which has swung so far in the wrong direction. This is the psychologic moment for the application of this effort because with the wonderful development in all of these lines has come the physical and commercial ability to adjust all the factors. Illumination can now be obtained of almost any intensity, character and color; paper of suitable characteristics can be procured, and type and illustrations which do not require paper with the abominable glossy, glaring characteristics that have previously been demanded, are being produced with the most realistic and artistically beautiful results imaginable.

During the last year or more the subject has to a considerable degree occupied the attention of several able investigators and illuminating engineers, and investigations have been made and are being made which have resulted in several practical experiments in the use of paper possessing characteristics embodying the ideas of these investigators.

Mr. A. J. Sweet studied the effect of glare and its depression of visual functions.

Mr. James R. Cravath has investigated the deleterious effects of glare and specular reflection from the surfaces of reading matter and also the advantageous effects of diffused illumination during reading.

The authors also discussed these factors and their application to school books and the conservation of school children's vision in a paper entitled "Conservation of the Eyes of School Children," presented before medical and educational authorities early in 1912.

Mr. M. Luckiesh also has investigated many phases of this subject, including the character of glare from reading surfaces and the effects of colored papers and monochromatic illumination.

Mr. A. J. Marshall also has made many practical experiments in connection with publishing the periodical "Good Lighting," and the results of these are shown in the present exhibits.

A number of other investigators have been and are working along the same lines, reference to which would consume unnecessary time.

By a little observation anyone will be able to find instances nowadays of practical use of paper and printing in very interesting and successful combinations, especially in catalog and cover work, most of which, however, have been accidental as far as this paper's subject is concerned, but which have been conceived and executed for commercial or artistic reasons.

Several instances can, nevertheless, be pointed out where intentional combinations were made with the express idea of conservation of vision in mind. Some of these may be mentioned.

The editor of the *Railway Electrical Engineer*, in March, 1912, adopted for the paper on which that periodical is printed a prepared matt surfaced paper of a tint slightly creamed, which, while possessing a very matt surface, reproduces half tones in an entirely satisfactory manner for the purpose of that journal.

Mr Arthur J. Sweet compiled and read a paper on a kindred subject before the Ann Arbor Section of the American Institute of Electrical Engineers, which was purposely printed upon paper of a decidedly dark brownish tint and very matt, uncoated surface, but in which no half tones were reproduced.

The Electrical Meterman's Handbook, which was compiled by the Committee on Meters of the National Electric Light Association during the spring of the year 1912, and under the editorship of one of the authors of the present article, was printed on paper manufactured as a result of the cooperation of the paper manufacturer, the publisher and the author. This paper is of a dark cream shade, with a surface which is not as completely matt as was desired, but which was the best procurable under the pressure of exertion which was put upon the publisher of this work in the very short time allotted to its publication. It can be considered as a step along the cooperative lines which it is believed will ultimately result in the selection or production and general adoption of the proper material. The latest edition of this book has an improvement in this respect embodied in its paper.

The August issue of "Good Lighting and Illuminating Engineer" announced the adoption of a policy of printing that journal on a quality of filled or coated paper which possesses to a considerable degree the desirable glareless features and varies slightly from the pure white in tint. Its last issue has

a still more wonderful result in halftone work on uncoated paper.

A recent publication of the Opalux Company has characteristics of this nature and utilizes colored ink.

The extremely interesting and valuable booklet on "Light: Its Use and Misuse," issued by the Illuminating Engineering Society at its convention in September, 1912, also utilizes paper of this character.

The Illuminating Engineering Society's Council has adopted a combination embodying these points for the issuance of its transactions.

The *Safety Heating and Lighting News* now uses matt surfaced coated paper.

Other technical journals, it is believed, will cooperate in promulgating and adopting these ideas, and with the school books also utilizing them, the popular magazines, with the consequent universal recognition of the idea, may be counted upon.

Many of the newer productions of the paper making industry, such as the English finish, bisque finish, dull enameled cameoplate and similar coated book papers—which can be secured in various tints—possess to a considerable degree the necessary matt surface and halftone reproduction qualifications and at the same time are no more expensive, and sometimes even a trifle less expensive, than the highly calendered paper now used for this work.

Bond papers can also be very successfully utilized, especially for offset and color work. Their light specific weight counteracts their higher unit cost.

The modern halftone and color printing process known as the "offset" process, produces its best work on uncalendered, uncoated, unfilled, matt surfaced paper, which paper possesses all of the characteristics desirable from an illuminating standpoint, and, on account of its purity, should stand rough usage and the ravages of time particularly well, making it desirable for works of permanent value.

The authors have prepared exhibits exemplifying successful combinations, and also have for distribution two other discussions, intentionally printed in various combinations, for your inspection and suggestions. One of the articles is a discussion on the Conservation of the Eyes of School Children,

first written over a year ago, which is really preliminary to the present paper, and treating of the same points.

It is, therefore, very encouraging to note that the recognition of the urgency of taking into consideration the matter of glare and specular reflection from the paper surface on which books are printed has occupied the attention at the time when, after several years of experimentation, the paper manufacturer has succeeded in producing papers which nearly or entirely embody the characteristics desired, and the lithographer has processes in which these papers can be utilized. The promulgation of the proper combination and sufficient demand are all that are lacking to assure general adoption.

These investigations also include, of course, the color of the ink to be used in connection with the tinted paper, the glare from the inked surfaces, the spacing of the reading lines, and the size and design, or style, of the letter used in the type.

The Illuminating Engineering Society has appointed a Committee on Glare from Reflecting Surfaces, composed of Mr. Luckiesh, chairman, Mr. Cravath, Mr. Elliott, Mr. Marshall, Mr. Gilpin, Dr. Black and Mr. Vaughn, which has set itself the task of coordinating all factors in the above ideas, and its forthcoming report will, it is expected, contain some definite recommendations.

It must be apparent that it is no longer necessary to subject oneself to eyestrain from these causes, if sufficient cooperation is present in this movement. The results will, by reason of their application to the entire commonwealth, from the school children to the generation that is almost past, be of such inestimable economic value to the world from increased efficiency everywhere, that its conception may be left to the imagination.

Having prepared the way by the promise of relief, it will not be amiss to discuss briefly the dangerous conditions and factors as they still exist in all but the most advanced and progressive branches.

This is primarily a lighting problem, for we must have light to see, and without it neither the eye nor the page would be of use. Had this been realized before, this climax of harmful effects might have been choked in its incipiency. We are, however, in this discussion, dealing mainly with reflected light, as we see the printed page by virtue of the reflected light only.

Reflected light is dependent upon the illumination superimposed upon the working page and upon the reflection characteristics of the reflecting and absorbing surface. This will be more apparent upon consideration of the principles of reflection.

Probably the only conception which most individuals have of the phenomenon of reflection is based upon the extremely simple and therefore easily remembered law taught for years: "The angle of reflection is equal to the angle of incidence." This law is as true today as in years gone by, if applied to the surfaces to which we were taught to apply it. Like many other physical laws, it is correct within its limitations, but must be expanded today to meet the newly appreciated conditions. The law, as stated above, is perfectly true and accurate when the light impinges upon surfaces such as mirrored glass, polished metal, or other surfaces approaching the same characteristics—in other words, it applies accurately to specular reflection. A beam of light, under this law, is reflected, minus loss by absorption, in a single direction, depending upon the angle at which it strikes the surface.

As our reading surfaces are neither metal nor glass, and yet seeing the page depends upon reflected light, it will readily be seen that other types of reflection must exist. If the surface is irregular or matt, as in the case of blotting paper, paper with the desirable characteristics discussed herein, and calcimined ceiling and wall surfaces, the reflected light will obey the law of diffuse reflection, according to which the incident beam will be broken up and diffused, or scattered, in all directions, the maximum rays of reflected light taking a direction perpendicular to the reflecting surface; thus, if the diffusion is perfect, dropping straight down from the ceiling for instance. The intensity of the rays in any other direction is proportionate to the chords of a circle drawn tangent to the surface at the point of incidence.

Some surfaces, such as media which are in their usual state specular in character, but which have been depolished similarly to a ground glass surface, obey a third form of the law of reflection—sometimes called the law of spread reflection—in which there is only a partial diffusion or scattering of the incident beam of light, the maximum reflection taking place at an angle assigned by the law of specular reflection

The intensity of the reflected rays in any direction may thus be represented approximately by an ellipse whose axis is in the direction of the angle of specular reflection and which is drawn tangent to the surface at the point of incidence.

The above argument and accompanying illustrations are embodied in a paper by A. J. Sweet, on "Reflecting Media" in the January issue of the *Railway Electrical Engineer*.

Not all reading pages, unfortunately, have a dull or matt surface, as blotting paper or the papers suggested in this article. We therefore have paper and other working surfaces whose reflecting characteristics are intermediate between specular and diffuse. A conception of the reflection phenomenon taking place on such papers can be obtained by imagining a piece of blotting paper covered by a pane of clear glass. The glass will reflect according to the law of specular reflection and the blotting paper according to the law of diffused reflection. It must be appreciated, therefore, that one must have reflection of light in order to see a reading page or any other object, excepting those which are self-luminous or transmit light. We are not, therefore, concerned with the elimination of reflection, but we are greatly interested in the elimination of that form of reflection which produces glare.

Most commercial papers used today reflect similarly to the clear-glass-blotting-paper combination—by both specular and diffuse reflection. As the latter is minimized and eliminated and the former accentuated, the amount of annoyance from glare is increased. Just as a mirror by specular reflection produces the image of the source of illumination, the brightness of which image interferes with seeing other objects in the line of vision, and by the resultant presence of light which is not useful, decreases visual acuity, so the specular reflection characteristic of any grade of paper used in a book having these peculiarities will produce eyestrain and ocular discomfort and low visual acuity on account of the glare received from the paper.

If the source of illumination is a single point or a single unit, its image, when the paper is held in certain positions, is very evident and can be minimized by changing the angular position of the paper. If more than one source in different positions are utilized, then each image is evident at a certain individual angle, and it becomes more and more nearly impos-

sible to eliminate them all by assuming any one position of the paper. Under ordinary circumstances, however, for the same intensity of illumination on the paper, the multiple source will be composed of smaller units, though their intrinsic brilliancy may be the same. Each image would then be smaller and less glaring though multiplied in number. Following the tendency of modern illuminating engineering, these would also be higher and further from the plane of the paper, and the images therefore smaller.

A source of direct illumination, when segregated into many component parts, produces illumination of more and more diffused character, proportionate to their multiplications.

The indirect system of lighting, in which the real working source of light is the ceiling itself, affords diffuse reflection on this principle and produces the most nearly completely diffuse illumination practicable at the present time, and in the absence, therefore, of specular sources of illumination, the specular reflection of these is absent. We therefore see that the glare from paper is dependent upon both the character of the paper and the character of the source of illumination—its height, its size and its intrinsic brilliancy.

The harmful results of glare as manifested by diminished visual efficiency, ocular discomfort, eyestrain and fatigue, may be segregated into two general divisions. First, our visual acuity is affected by a flood of excessive light into the eye and by the halation on the retina surrounding the image of the glare producing source, and the too rapid bleaching of the visual purple or photochemical substance in the retina, causing an overload on the regenerative organs producing this fluid, namely, the rods.

Second, various forms of eyestrain, ocular discomfort and fatigue are caused by the muscular fatigue of the different portions of the ocular protective mechanisms produced by the constant endeavor, under adverse conditions of illumination, to adjust the eye to and protect it from the harmful outside influences. Thus the eye becomes fatigued, as is evidenced by pain and headache. More serious results obtain when the muscle controlling the iris, in its attempt to protect the retina against the glare, hold it in a continuously contracted state, and the active muscles of the ocular protective mechanism become tired out through excessive squinting and winking

or ineffectual attempts at accommodation. Since glare can produce harmful effects, as cited in the first instance, by excess of light in the eye, it follows that glare effects can result from any cause admitting excessive, nonuseful light into the eyes, and may, therefore, be produced by reflection from even diffused surfaces, such as walls, ceilings and even matt surfaced papers, if the coefficient of reflection is relatively high and the intensity of illumination is excessive, as may be the case if the paper is very intensely white. This is known, according to Mr. Cravath, to be particularly true when the glare source is amid dark surroundings, and may be relatively ineffective if the surroundings are bright.

This reference to glare from white paper leads us to another phase of the subject, that of the effect of color on vision. Monochromatic light has been demonstrated to be productive of the condition of greater visual acuity than that accompanying the use of light composed of all or most of the rays of visual spectrum. Visual acuity, under the light of the mercury vapor lamp, has been proven to be many per cent greater than under the light of the tungsten. It is also believed by many that tints of paper, other than pure white, are more comfortable to read from, and investigations into the question of what tint of paper and ink are productive of the best state of ocular efficiency and comfort are being made at the present time.

This subject of the tint of paper most comfortable to work with is the one which the present authors wish to call to your attention and to ask for your suggestions. With this end in view there have been distributed copies of the "Conservation of the Eyes of School Children," in which the features of type, ink, lines and diffused illumination are considered more in detail.

The effect of light from a bright source entering the eyes is to diminish visual acuity; the brighter the source the greater the reduction in ability to see, up to a certain intensity, after which marked increase in the intensity has but little effect.

If the reflected light from the object looked at under the above conditions is of low intensity, the ability to see the object is much less than when the ratio between the light from the bright source entering the eye, and that from the reflected light from the object fixed, is more nearly approximate.

The proximity of a bright light source to the object fixed, effects visual acuity; the closer the two are together, the greater the reduction in the ability to see, unless they approach equality in brightness.

The degree in the loss in visual acuity is dependent upon two factors, i. e., "the total amount of light which enters the eye, and the angle with the line of vision at which each integral portion of such light enters the eye." (Sweet and Doane, Transactions I. E. S., February, 1913.)

"Excessive light in the eye is likely to be derived from one of three sources—directly from light units located within the normal field of vision, or from walls, or by specular reflection from the visualized object or its immediate surroundings." (Sweet and Doane.)

Not only do the above factors diminish visual acuity, but in order to see clearly under such conditions, an increased effort is required of the visual apparatus, which results in true eyestrain with its attendant discomfort.

Other factors in producing eyestrain are: the attempt at using the eyes under an unsteady or flickering light, such as an electric lamp on a swinging cord, an open gas jet, or under conditions where there are rapid changes in the intensity of the illuminating source.

It is not the intention of the authors to give the impression that there is in this discussion anything novel in the way of findings or data, but it is their earnest desire, by this paper and the others referred to and abstracted from, to so emphasize the points bearing on this subject as to bring home to each one who reads this and similar arguments, the great importance to the commonwealth and to the individual of giving it mature consideration and enthusiastic support.

It is also the desire of the authors to acknowledge the work of the other investigators of this subject, especially the members of the Glare Committee and Mr. Sweet, whose discussions have been more or less coordinated and abstracted in this paper.

XXII.

REPORT OF A CASE OF PRIMARY SARCOMA OF THE CORNEA.*

L. W. Dean, M. D.

Iowa City.

Mrs. C., age sixty-three, white, American, presented herself at my clinic on April 24, 1912. Patient stated that about three months before she noticed a brownish swelling, rather flat, growing on the cornea of her right eye. Recently the tumor has not increased in size but has in thickness. No pain. Vision has failed rapidly.

Examination of the right cornea: There is a tumor apparently growing from the anterior surface of the cornea. It has the color of a light rust, is very vascular; transverse and vertical diameters are each about 5 mm.; the apex is apparently 1½ mm. above the surface of the cornea. The tumor occupies the central portion of the upper half of the cornea, extending a little below the median line. Between the tumor and the corneoscleral boundary above is 1 mm. of transparent cornea traversed by numerous blood vessels. Below the tumor the cornea is infiltrated for a distance of 1½ mm.

Diagnosis: Malignant tumor of the cornea. Enucleation advised. April 25, 1912, the eye was enucleated.

The following is the report of Prof. Henry Albert:

Gross Pathology:—(Cells principally spindle-shaped). The tumor presented itself as an opaque, grayish colored, slightly raised mass, 7 mm. in diameter and extending from a point 1½ mm. on the corneal side of the corneoscleral juncture, across the cornea to a point 1½ mm. beyond the center of the cornea.

Cut surface: With the eye cut in two, directly across the

*Read before the Chicago Ophthalmological Society, April 19, 1913.

tumor, the relationship of the tumor to the cornea was readily recognizable, the tumor being opaque and of a dark grayish color. The tumor was apparently superimposed on the anterior surface of the cornea, the portion of the cornea lying beneath the tumor being apparently just as thick as elsewhere, and was also apparently not infiltrated by the tumor. The thickness of the cornea throughout was about ¾ mm. The tumor was thickest at its center, where it measured 1⅛ mm. From the center it gradually tapered to the edges until such apparently fused with the cornea proper.

Microscopic Pathology:—1. Relationship of tumor to cornea: Microscopically it was found that the tumor was a cellular mass of tissue overlying the cornea proper. At the edge the epithelium of the cornea overlapped the tumor slightly. The greater part of the surface of the tumor was not covered by epithelial cells. The tumor substance is quite well defined from the underlying corneal tissue, but there is nothing to suggest capsule formation. The place occupied by the tumor is devoid of epithelium. Bowman's membrane is intact except at one place and that is beneath the center, and evidently the oldest portion of the tumor. Here the membrane presents a break, the free ends being considerably separated and turned outward, that is, tumorward; due no doubt to the proliferation of tumor cells beneath them. At this particular place the substantia propria of the cornea is slightly infiltrated by the tumor.

2. Principal (essential) tumor cells: The principal cells of the tumor are rather large, round or oval or oat-shaped, with some slightly spindle shaped. The cytoplasm is quite large. Mitotic figures are numerous. A few of the cells possess a finely granular, yellowish colored pigment, suggestive of a melanoma (melanotic sarcoma).

3. Blood vessels: The tumor is rather richly supplied with capillary blood vessels lined by endothelial cells.

4. Other cells: In addition to the essential tumor cells there are a number of lymphocytes, which are found principally immediately surrounding the capillary vessels.

5. Intercellular substance: Between the principal cells of the tumor is an abundance of collogen intercellular fibrils, as revealed by Van Gieson's stain and Mallory's phosphotungstic-acid hematoxylin stain. Fibroglia fibrils are also present.

Diagnosis of tumor: Sarcoma of the oat-shaped and spindle-celled type.

Origin of tumor: The tumor appears to be distinctly a corneal tumor. At no place did it appear to come in contact with the corneoscleral juncture, and therefore cannot well have had its origin from the sclerotic coat or the conjunctiva. The blood vessels of the tumor appear to have come from the vessels normally found about the periphery of the cornea. Whether the tumor had its origin from the connective tissue elements of the substantia propria of the cornea or from connective tissue cells accompanying blood vessels which have extended in from the periphery of the cornea, it is impossible to determine from the specimen as such. If it originated from blood vessels, the development of the tumor should have been preceded by some other pathologic process affecting the cornea, such as keratitis accompanied by the invasion of the latter by blood vessels. Such not having been the case, or at least not having been recognized, it is most probable that the tumor had its origin from the superficial layers of the substantia propria, and thus represents distinctly a primary neoplasm of the cornea.

XXIII.

DEGENERATION OF THE CORNEAS OF A MAN AND HIS ADULT SON.*

BURTON CHANCE, M. D.,

PHILADELPHIA.

Notwithstanding the fact that numerous cases of nodular degeneration of the cornea, as found directly connected in two or more generations, or in several members of a family have been reported in the past twenty years, such occurrences are by no means as common as one might be led to believe from a review of the literature. And, although at the meeting of this society last year Dr. Dunbar Roy detailed six cases in a single family, I now venture to report the finding of the affection in a man and his son, because I believe their disease presents certain characteristics unlike any other case heretofore described.

These men were referred to me by Dr. Frederick Willson of Reading, Pennsylvania, in November, 1912. They had become well known in their community as self-supporting blind men; the father maintaining a traveling "Punch and Judy" and other penny shows at fairs, and the son keeping a small shop and pool room.

The father is fifty-four years of age, a native of Pennsylvania, of German descent, born of unrelated parents. In his early manhood he assisted his father in the tuning and repairing of pipe organs; the building of organs had been conducted by five generations of his family. In none of his progenitors was there one known to have been affected by any unusual trouble with the sight. He gives no history of serious bodily illness nor of accidents, but his eyesight has always been poor. In infancy and early childhood he had severe attacks of "sore eyes," but he doubts that the inflammation either caused his

*Read at the meeting of the American Ophthalmological Society, Washington, D. C., May 6, 1913.

had sight or appreciably diminished what he had. In the summer of 1912 he had an attack of the same kind of inflammation, which did not materially affect what sight he had left.

The man is well developed, is of quite heavy build, though but of about five feet six inches in height. He is of an amiable disposition and of distinct intelligence. He was married at twenty-four years of age, has had three children, one dying in infancy; a daughter whose eyes are healthy, and the son, the subject of the accompanying history, remaining.

He has had only the most irregular kind of attention given to his eyes. He states that several physicians to whom he applied for treatment suggested that his disease had been caused by inherited specific infection, and they prescribed mercury, without paying any attention as to the effects of that drug, and he drifted away.

The visual acuity in recent years has been equal to only the appreciation of the motion of fingers at a foot or two. When the eyes are at rest they deviate in the direction of the axes of the orbits in the manner of amaurotic eyes; but all attentive ocular movements are preserved and the irides react. The conjunctivas in the lower folds are somewhat thickened, as though there had been repeated attacks of conjunctivitis, which probably was the disease mentioned. The upper tarsal surfaces are smooth and healthy. The globes are well-formed, and show no signs of serious disease, past or present, other than what is here specified in the description of the corneas.

At the center of each cornea, and for two-thirds of the area of the cornea, is a faint, almost circular disc of a yellowish gray flocculent material or coagulum. It is beneath the epithelium, which is intact and glistening. The discs seem to be composed of flocculent material which lies beneath Bowman's membrane and in the anterior layers of the stroma, as though they were resting between the membrane and the stroma. Here and there are glistening points like crystals. At the apex of the summit there are two larger bodies, looking very much like bubbles, of about 1½ mm. in size, which project forward beyond the general surface of the cornea.

These discoid areas terminate somewhat unevenly and are not sharply circumscribed by a continuous line, as is so frequently seen in cicatricial deposits and other infiltrations. These terminations assume an indefinite network in the arrangement of the radiations.

The centers of the discs show condensation, outside of which is a more or less transparent zone, while beyond this is another denser portion which ends in the more or less diamond-shaped reticulations.

The corneal membrane between the areas and the limbus is quite clear and healthy, showing no sign of infiltrate or of vessels, and through this portion the iris is seen as perfectly as in a healthy eye. The crypts are rather deep; the reactions are prompt. No view of the fundus of either eye could be obtained, but there was a red glare, showing that the vitreous is presumably clear.

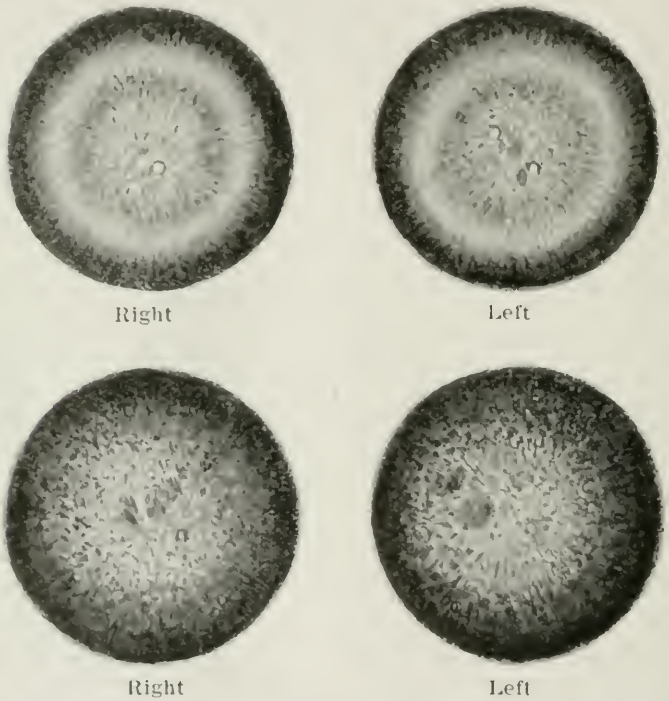
The son is twenty-six years old; he is married, but without children. Not until he was sent to school at age seven was it known that his sight was poor; by the age of twelve it had become much dimmer. At that time he had attacks of "sore eyes," of short duration, which he said were believed to be the effects of the presence of "wild hairs." He left school at fourteen because he could not see. His eyes were not inflamed after seventeen, nor had there been any greater loss of sight, nor other ill health, until he was twenty-five, when he had an attack of typhoid fever. On his recovery, he counted his eyesight worse than before. He has regarded himself to be as healthy as most of his friends, barring his bad sight. He recalls a slight attack of measles; and his teeth decayed early, so that he has worn an upper plate for five years.

At age thirteen, he states, he was treated by a physician near his home, but this oculist, with whom I have been in communication, cannot recall his case to me; and two years ago he was treated by another for "interstitial keratitis."

The son's appearance is not as robust as his father's—he seems stunted; his tibias are somewhat bowed and their spines flat. His face is scaphoid and pale, yet his appearance is not typic of the rachitic nor of the leuetic diathesis. His disposition is rather taciturn, and he glances about furtively. He seems to have photophobia, yet he does not complain of it. His eyelids are smooth and clear, the globes are not injected; there is no pannus.

In effect his corneas present the same characteristics as were noted in his father's eyes, except that the discoid opacities are not so dense and betray a somewhat more pronounced reticulation. The surfaces of the corneas are even, smooth and polished; and they are distinctly sensitive.

The inner two-thirds of each cornea is occupied somewhat eccentrically by an opacity composed of fine grayish dots closely grouped together in illy-defined lines which are arranged in imperfect lattice or reticulate formation. The dots are from the most minute to one-half millimeter in diameter. Just below the center of the summit in the right is a distinctly circular nodule which appears as though it were funneled. To



To illustrate Burton Chance's cases of degeneration of the corneas in a man and his son. After drawings by Miss M. Washington.

the right of and near to the vertical diameter of the summit of the disc in each is a glistening nodule or bubble, which projects beyond the surface much like those seen in the father's case. In the left are two closely united irregular ones with the same character.

The peripheral one-third of the cornea in each eye is entirely transparent and contains no opacities, nor could any

vessels, full or empty, be seen. Everywhere the epithelium is intact, smooth and glistening. The irides react promptly, the crypts are distinct, and mydriasis can be easily and completely effected by homatropin. The opacities prevent views of the funduses; there can be got, however, red glares, and the retinas are sensitive to the mirror reflections, as were shown by the iris reactions.

While I have seen instances of nodular degeneration of the cornea, I have not seen corneas marked in the way these four are. The opacities are circumscribed and bilateral, of approximately equal size in each eye, and each person's like the other, except that the son's are less dense, or rather the lines are not so numerous. At first glance they looked like the residue of an interstitial keratitis, which image a closer inspection immediately dispelled. At the center of the patches the masses are so close together as to be without arrangement —it is only in the periphery that the reticulation is apparent.

Here are two cases of degeneration of the cornea of unusual extent in a man and his son whose sight has been poor since their earliest recollections, and it has gradually progressed until now they can see objects only. The disease has been bilateral without inflammatory signs and has been confined to the central two-thirds of the corneal membrane.

Except for the irregular nodules, or bubbles, and the crystalloid particles already noted, there are no other anatomic changes. There are no criss-cross latticings of fine threads, as described by Haab in his paper "Die gittrige Keratitis,"[1] nor as in those by Freund.[2] Nor are there any pigment-like deposits, as shown in Doyne and Stephenson's[3] cases. The epithelial and superficial layers of the cornea do not seem to enter into the process, so that except in the two or three special spots the surfaces are even, smooth and polished, just as in Fehr's[4] cases.

Indeed, I would place my cases among Fehr's, and only claim for them that they are instances of "family spotted degeneration of the cornea."

When one stands some distance from the patients the corneas do not seem to be diseased, for the irides can be seen through the milky film, and the corneal surfaces are polished. The artist in making the sketches was not able to depict the deposits as faint as they really are; or, rather, it seemed im-

possible to reproduce them without using masses of the water-color pigments; all of which made a picture resembling an ordinary leukoma. The drawings were made when the pupils were widely dilated, their edges being at the borders of the corneal opacities. The areas in my cases might be likened to Figs. 3 and 5, in Doyne and Stephenson's cases, yet the fine dots are not so uniformly spread over as in theirs; and also like that in Dimmer's[3] Fig. 1.

To satisfy myself that they were not of syphilitic taint, for neither man exhibited the facies of that disease, I sent them to Dr. John Laird for the purpose of study by the Wassermann test. He reported that in each case the hemolysis was complete, and the results negative, and he remarked that he was "almost sorry he could not find them positive." A condition which I, too, regretted, having in mind the good effects of mercurial preparations in syphilitic disease of the cornea.

The men were sent home to undergo a short course, in their eyes, of a solution containing atropin, holocain, and dionin; and a pill of calcium lactate. At the end of twelve days they returned, stating that they had brighter distant vision, but as their accommodation had been paralyzed, it was impossible for them to see near at hand as well as heretofore. At about this time my neighbor, Dr. Fenton, saw the men with me in consultation.

In March, through the kindness of Professor Alfred Stengel, the men were admitted to the medical wards of the University Hospital, for the purpose of studying the metabolic processes of their nature; I had the hope that some radical chemical aberration might be discovered present in them to throw a light on the etiology of this obscure malady.

Dr. Gordon Saxon, who conducted the studies for eleven days, reported that the urinalysis disclosed nothing of pathologic intent, and that the nitrogen content in each case harmonized with that found in normal men; practically a negative return. The examination of the blood disclosed the following characteristics:

In the Father's case		In the Son's case	
Hemoglobin	97%	Hemoglobin	91%
Red blood corpuscles	5,100,000	Red blood corpuscles	4,810,000
White blood corpuscles	8,800	White blood corpuscles	9,400

DIFFERENTIAL COUNTINGS.

	In the Father's case	In the Son's case
Polymorphonuclear	74	72
Lymphocytes	23	23
Large mononuclear	2	3
Transitionals	1	2
Eosinophiles	0	

And in each case the von Pirquet tubercular tests were negative.

When last seen each man declared himself to be physically improved, but that was only by reason of a better ordered diet which I had prescribed for them. Each believed he had a wider field of vision, but neither could see better than the counting of fingers at one-half meter.

I have the hope that I may be allowed to perform iridectomy in each of these men, with the expectation that the sight may be increased to a serviceable degree.

For obvious reasons I could not excise portions of these corneas for histologic study. I can only conjecture that the process is a hyalin degeneration of the superficial layer of the substance of the cornea, with probably an involvement of Bowman's membrane.

I do not pretend to assert that the disease is congenital, that is, prenatal, yet it is not at all unlikey that it was in these cases, because of the very early loss of sight it must have become manifest in their infancy. It is not likely that the degeneration has increased since early childhood; the father does not recall anyone telling him that his eyes have changed in appearance, and his elders have regarded the son's case to be identical with his own. And I feel safe in stating that neither syphilis nor tuberculosis could have been the cause of the disease in these two men.

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XXIV.

HOLE IN THE DISC.

Carl Williams, M. D.,

Philadelphia.

Conditions known as "hole in the disc," or "circumscribed depressions," or "pitting of the optic disc," have been reported from time to time, and consist of a small sharply defined pit of varying shape and depth, contained within the boundaries of the optic disc. It is a rare anomaly, only some twenty-four or twenty-five cases being found in the literature, though there are found a number of borderline cases between this condition and the true coloboma of the optic disc.

A review of the reported cases finds the position of the pit or hole in the majority, as in my case, to be on the temporal lower quadrant of the disc. Two cases[1 2] had the hole in the nasal half of the disc, and in one[1] the pit was immediately below the disc. All of the holes were near the disc margins. One disc had two pits.[1] Stood's case had a pit in each optic disc. All the other reported cases were unilateral.

The holes are for the most part oval, the long axis being parallel with that of the disc. In three cases[1 3 4] small vessels were contained in the depression. The depression is sharply defined and passes straight back in some cases, or may have more or less sloping sides. The depth also varies greatly, the case reported by Lichtenstein[5] having a depth of 8 to 9 mm. Gunn[6] reported a case in which the bottom of the pit could not be seen with the ophthalmoscope. The circumference of the pit varies from that of a small hole to one a third the size of the disc. In five cases the depression contained pigment. The vision, as a rule, is not disturbed, nor are the fields affected.

All the cases so far seen, except the one reported below, have occurred in adults, the youngest being eighteen (Frenkel [7]). Various theories, all more or less allied, as to the origin

of these cavities have been presented. No case has yet been examined pathologically. Wiethe[1] and Michel considered them as derived from the fetal cleft. Stood[7] ascribed them to a disturbance in the lamina cribrosa. Remak[2] and Szili believes them allied to the coloboma of the optic disc. Coats,[9] who has written thoroughly on the subject, ascribed the presence of these pits in the disc to the theory suggested by Mouthus and Opin[10], i. e., "the evagination of a portion of the secondary optic vesicle into the nerve, or more probably by the abnormal differentiation of a part of the neural division of the vesicle into pigment epithelium and retinal elements." He explains the presence of pigment in the holes as being derived from the pigment of the retinal epithelium. The absence of pigment is ascribed to the fact that only the inner layer of the secondary optic vesicle has been evaginated, or to the fact that if the outer layer was also evaginated, the pigment epithelium has lost its pigment.

A report of the case which has come under my observation is as follows:

In May, 1911, A. L., a school girl, aged nine, consulted me complaining of headache, red eyelids and general symptoms of eye strain. The family and general personal history was negative. The vision in each eye was found to be 5/22. This, however, became 5/6 after the refractive error was corrected with + 2 S. ⊃ .50 cyl., axis 90°.

The ophthalmoscope discovered in and about each macula a granular erosion. With the exception of the anomaly about to be described, no other changes or unusual conditions were found. A more particular description of the right eyeground showed a round disc, clear cut in outline, a narrow pigment line all around, blood vessels emerging somewhat to the nasal side and slightly above the median line from an excavation, the bottom of which shows the lamina cribrosa. This excavation slopes up to the disc margin in the lower outer quadrant. On the sloping surface of the excavation in this quadrant is an oval punched out hole, in area about a quarter of the size of the quadrant. The long axis extends nearly horizontally, the outer angle of the hole reaching nearly to the disc margins. The walls of this hole or pit are almost perpendicular. The floor is indistinctly seen and is about four diopters below the disc surface. The color of the pit is dark,

perhaps pigmented, with a greenish hue. Emerging from the outer angle are two blood vessels which go to the macular region.

The impression given by the ophthalmoscopic picture is most vivid and striking, an impression, I regret to say, not at all conveyed by the accompanying drawing.

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XXV.

THE TREPHINING OPERATION IN GLAUCOMA.*

JESSE S. WYLER, M. D.,

CINCINNATI.

Whenever a wealth of medicaments or operations presents itself for the relief of a certain condition, we then realize that the therapy leaves much to be desired. And thus it is with glaucoma, the disease not alone painful to the patient, but to the ophthalmologist as well. Glance over the list of procedures for its relief, and whether you perform Graefe's iridectomy, Heine's cyclodialysis, Lagrange's sclerectoiridectomy, Elliott's trepanation, anterior and posterior sclerotomy, or resort to eserin and citrate of soda injections, still there remains much to be wished for in a great many instances.

It is not my intention to discuss the etiology and symptoms of glaucoma. As to the pathologic side, one positive point remains in all the theories as yet evolved. Glaucoma is a term used to designate an increase in the intraocular tension, and, as that, is merely a symptom of some pathologic process not well defined up to the present. This increase in tension is due to an increase in the contents of the eye, possibly from diminished outflow of the fluids, or from an excess in renewal.

You must perceive by the foregoing remarks that I do not desire to elicit a discussion upon the theories explaining the cause, but merely to lead up to the fact that an increase in the rapidity of outgoing fluids has a tendency to reduce the contents of the ball and thus lower its pressure. Many years ago it was discovered that in cases of cystoid scars after cutting operations upon the bulb, a filtration of the ocular fluid took place under the conjunctiva, and the eye remained in a state of reduced tension. It is upon this fact that the pres-

*This paper was written and read in November, 1912, consequently the more recent literature is not referred to. My present experience exactly doubles the number of cases reported, and with a longer interval in which to judge results, my high opinion of this operation has not varied.

ent method of operative procedure is based; a symptomatic treatment rather than a curative one. In a goodly number of cases the method is very effective, and as the true cause of the increase is still dubious, we can perform this operation without considering whether we are dealing with an edema of the colloids, according to Fischer's observation, with arteriosclerosis of the fibers of the pectinate ligament, as Verhoeff implies, with Heerfodt's blocking of the vorticose veins in the sinus, or the old attachment of the root of the iris to the posterior corneal wall. All these theories have their supporters, and flaws can be found in all of them, but an outlet to some of the fluid contents of the eye acts well, despite the pathologic principle involved, and I find that a slightly modified Elliott's trephining is the best mode of creating a persistent filtration scar.

The method is simple. An ordinary speculum is inserted, and a small flap, usually V-shaped, about 3 to 4 mm. long, dissected loose, clear into the stroma of the cornea at the upper limbus. This is easily accomplished by grasping the conjunctiva, at the point decided upon for the apex, with a fine-toothed forceps, and a curved-pointed scissors will prepare the desired flap to the limbus, at which point a keratome will assist in getting into the corneal layers. A drop of adrenalin will stop all bleeding. Care must be taken not to buttonhole the flap. There is a diversity of opinion as to the size of the trephine opening, but 1.5 to 2 mm. seems sufficiently large. I use a Schnaudigel instrument, made by Windler, Berlin, because it has a movable guard for the cutting edge which acts as a stop during the operation. I am now having smaller blades fitted to my von Hippel spring trephine, and hope to find this simpler and faster. The cutting edge is placed exactly at the limbus, in order to enter the angle of the anterior chamber, and with a few rotary movements, testing the depth of the incision constantly, a button of tissue is soon excised. There is some danger that this button may fall into the eye, but by holding the trephine at a slight angle, an attachment to the sclera is left upon one side and the force of the escaping fluids makes it easy to grasp this tissue and cut it away with a scissors or knife. The iris may prolapse into the opening. In such a case a radial incision into same will allow easy reposition. The flap is then turned over and light dressing put on.

The other complications are relatively few in number:

1. The trephine opening may be too peripheral, so that instead of entering the anterior chamber vitreous escapes. A case of this was reported by Stock, but by following the technic it may readily be avoided.

2. The button of tissue falls into the anterior chamber (Stephenson). This has been found to do no harm, and unless the trephine is used with too much force, it will not easily result, as the pressure from within has a material tendency to drive the loose tissue outward.

3. The conjunctival flap may be lacerated either in its preparation or by the blade of the trephine. In the former case a new flap should be made, and in the latter the tear is so small that the ultimate result is unaffected.

The advantages of this operation are many:

1. It is easy to perform and complications are rare following the procedure.

2. The instruments need not enter the interior of the bulb, hence the danger of infection is slight.

3. In the majority of cases a round pupil remains, which fact prevents the blending from strong lights and allows for future use of miotics if so desired.

4. The depth of the anterior chamber has no influence, and postoperative hemorrhage need not be feared.

5. Astigmatism, which follows most of the corneal cutting operations, is a negligible quantity.

6. The statistics up to the present time have shown the percentage of results superior to any one single method.

Schnaudigel, in his paper before the Heidelberg Ophthalmological Society, 1912, after describing his technic, mentions twelve cases in which he achieved desirable results. In the discussion following, Prof. Stock of Jena quoted his statistics of fifty-four eyes operated, all more than four weeks previously. Twenty-one of these eyes suffered from glaucoma simplex, and of this number nineteen were cured and two eyes lost. He had twenty-three inflammatory cases, and cured nineteen of this number, while two of the last four suffered from absolute glaucoma. Stock is very enthusiastic over his results and recommends the trephining operation most warmly.

Kuhnt of Bonn has been performing this Elliott operation for several months past. He claims that in a certain percent-

age of cases, those in which the conjunctiva is friable and bound tightly to the sclera for several millimeters around the cornea, the work cannot be done. However, in his clinic the success has been marked.

Axenfeld warns operators that following trephining a mydriatic should be instilled, and only later in the treatment should a miotic be resorted to.

My own results are based upon only four cases. The first a chronic inflammatory glaucoma with a tension of 76 mm. (Schiötz), iris dilated and very atrophic. No anterior chamber and considerable pain. Following the operation the tension stood at 14 mm. for four weeks, although the iris remained dilated and the chamber did not reform. Suddenly inflammation started, and when I saw the woman again the tension was 68 mm. I used the double opening described by Schnaudigel, with a drop in pressure to 35 mm. and relief of pain. The eye was amaurotic before my first operation, and still remains in this condition after four months. I was unable to find the hole of my first operation, and presume that the tension arose when this filled up with connective tissue.

The second case was an amaurotic eye in a colored man, who had become blind in one eye without knowledge of the fact. The ophthalmoscope showed a total excavation of the disc with a tension of 30. He was given a subconjunctival injection of citrate of soda (Fischer), and twenty-four hours later the tonometer showed 35. Following a perfectly smooth trephining the tension remained at 18. Case of glaucoma simplex.

A middle aged man operated ten years previously for traumatic cataract with incarceration of the angles of the iris, suddenly seized with pain and redness, cornea stippled and iris discolored, tension 82. Relieved with eserin in oil, but tension remained at 36. Trephined above coloboma and hook inserted and membranous cataract split. Tension remains at 26. This was a case of secondary glaucoma.

My last case was a glaucoma simplex with gradually failing vision and contraction of the field, despite eserin therapy. Tension originally 32. At present the pressure is 24, but sufficient time has not elapsed to decide upon the permanency of the result.

XXVI.

REPORT OF CASE; NEW OPERATION FOR EXTIRPATION OF TARSUS OF UPPER LID.*

F. W. Dean, M. D.,

Council Bluffs.

The tarsus of the upper lid is removed usually for one of the following conditions, according to John Green, Jr.:

First.—Long standing cases in which the lids show trachomatous infiltration with granulation deposits in the connective tissue of the retrotarsal folds, whether the cornea be affected or not.

Second.—Thickening and enlargement of the tarsus.

Third.—Disease of the folds with corneal complications, but without involvement of the tarsus.

Fourth—Deep seated foci in the tarsus remaining after the cure of granulations in the tarsal folds.

In the first and third conditions, i. e., long standing cases in which the lids show trachomatous infiltration with granulation deposits in the connective tissue of the retrotarsal folds, whether the cornea be affected or not, disease of the folds with corneal complications, but without involvement of the tarsus, it is essential to remove along with the cartilage a part at least of the diseased portion of the conjunctiva. The lid is everted, an incision made through the conjunctiva $2\frac{1}{2}$ or 3 mm. from the edge of the lid, another incision is made from inner to outer canthus, above all the diseased part of the conjunctiva, if possible, and the membrane between the two incisions, together with all the tarsus except a strip about $2\frac{1}{2}$ mm. wide at the margin, are dissected out. The upper cut margin of the mucous membrane is brought down so as to be attached to the conjunctiva remaining at the margin of the lid.

*Presented at the Ophthalmic Section of the Omaha-Douglas County Medical Society, September 19, 1912.

In the second and fourth conditions, i. e., in thickening and enlargement of the tarsus, and deep seated foci in the tarsus remaining after the cure of the granulations in the tarsal folds, the essential thing is the removal of the tarsus, and good results are obtained without the sacrifice of any of the conjunctiva.

For the removal of the tarsus alone, I believe that Kuhnt's operation is done most frequently, or Kuhnt's operation with only slight changes. The lid is everted, an incision made through the conjunctiva 2½ mm. from the margin of the lid, the conjunctiva separated from the tarsus, and the tarsus removed, except a narrow strip along the margin of the lid. The incised conjunctiva is sometimes stitched and sometimes left to unite without suturing. Weeks uses three double armed silk sutures, passing them through the margin of the conjunctival flap at equal distances apart, forming loops on the conjunctival surface 2 or 3 mm. long. These sutures are carried through the tissue of the lid just back of the cut margin of the remaining strip of tarsus and tied on the cutaneous surface, usually over small rolls of sterile gauze without much tension.

I wish to report a case to describe my method of operating.

Miss R. H., age about twenty, was treated by me for trachoma. The case was one of long standing. I succeeded in freeing the retrotarsal folds from the trachomatous granulations, but the cartilage of each upper lid was much thickened by trachomatous infiltration, producing a marked ptosis. The mucous membrane covering the tarsus was rough and filled with scar tissue. The cartilage was somewhat incurved, but not to the extent of producing trichiasis. The epithelial layer of that portion of the cornea which was constantly covered by the lids was infiltrated slightly with blood vessels, and a number of small ulcers about 1 mm. in diameter were almost constantly present in spite of treatment.

This condition caused pain, photophobia and lacrimation. I decided to remove the cartilages, and the patient was sent to the hospital. June 8th, 1912, under general anesthesia, I removed the tarsus from each upper lid with the following technic: The lid was placed in a clamp to prevent hemorrhage; an incision was made through the skin and muscle down to the cartilage throughout its entire length, 3 mm.

from and parallel to the margin of the upper lid. The skin and muscle was loosened and pushed up from the surface of the tarsus. Next the cartilage was cut through from end to end, about 3 mm. from the margin of the lid. This cut is really a deepening of the first incision, which was made through skin and muscle, but I believe one is less likely to injure the underlying conjunctiva if the cuts are made separately. The tarsus was then dissected up from the conjunctiva, which is very easily accomplished, if one keeps close to the cartilage. When the cartilage was separated from the conjunctiva, the tissues were cut from the upper border and the freed piece removed.

The operation was finished by closing the skin incision with four interrupted silk sutures. The sutures were removed on the third day. The conjunctiva was soft and smooth, the cornea looked clearer and the ptosis had disappeared.

The advantages of this method of making an incision through the skin are that it is an easy operation to do; there is no injury to the conjunctiva; and the patient is saved the suffering which is sometimes caused by the stitches when the incision in the conjunctiva is sutured.

While I have never tried it, I believe that to remove the tarsus of the upper lid by this method and to bring down the cut end of the levator muscle and fasten it with sutures close to the margin of the lid, would be a good procedure in operating for congenital ptosis.

XXVII.

INTERSTITIAL KERATITIS OF LUETIC ORIGIN.

George S. Derby, M. D.,

Boston,

And Clifford B. Walker, A. M., M. D.,

(By Invitation),

Boston.

On account of its chronic nature and its great resistance to treatment, interstitial keratitis of hereditary syphilitic origin is a disease which usually excites little interest in the clinic, and is of the most trying nature to the ophthalmologist and to the patient in private practice.

It belongs to the eye diseases of moderate frequency, occurring in the statistics collected by Hoor,[1] comprising 475,000 cases, 3,026 times, a percentage of .63. In some 77,000 new cases at the Massachusetts Charitable Eye and Ear Infirmary during the past four years the percentage was slightly over .4. Probably a sufficiently close average is one case in every 200.

When we look below the surface of this disease many problems confront us, for the mode of its production is still shrouded in mystery.

Why does it seldom, if ever, develop in the early months of life, at the time when the signs of congenital syphilis are usually in evidence? Why is it sometimes the only outward sign of an hereditary syphilis? Why are the ordinary methods of treatment—mercury and salvarsan, usually so successful in luetic disorders—so comparatively ineffectual here? What progress is being made toward the solution of these problems?

There are two widely divergent views as to the nature of interstitial keratitis: one, that the disease is due to the direct

action of the spirocheta pallida; while the second holds that it is rather an indirect manifestation of syphilis, and may be classed among the meta- or parasyphilitic affections.

Evidence in favor of the direct infection may be summarized as follows: Von Hippel has published a case of intrauterine interstitial keratitis in an hereditary luetic fetus of thirty-three weeks, and in the cornea Schneider was able to demonstrate spirochetæ by the Levaditi method.

Clausen[2] has observed a case of interstitial keratitis in a four and one-half months' child with marked signs of congenital syphilis, and found spirochetæ in the cornea.

A number of investigators have found the spirocheta in the intact corneæ of syphilitic fetuses and newborn children.

Igersheimer demonstrated at a meeting in Halle, in 1910, a section from the cornea of an hereditary luetic boy who had developed a well-marked interstitial keratitis, which showed one apparently undoubted spirocheta. It was stained by Levaditi's method.

Greeff, Clausen, Bertarelli, Mühlens, Scherber, Schucht, Uhlenhuth, and Multzer, besides many others, have produced an interstitial keratitis in lower animals by the injection of syphilitic material into the cornea or anterior chamber.

Another suggestive fact pointing toward a direct infection is to be found in recent work on the socalled para- or metasyphilitic infection to which we shall allude later.

The opponents of the direct infection theory take up these points seriatim.

In regard to von Hippel's case and that of Clausen,* it is stated that they belong rather to the earlier stages of syphilis than to the later lesions, and the histologic evidence is in favor of such a view.

It has already been mentionod, and is well established, that spirochetæ are often found in the corneæ of hereditary syphilitic infants, and usually give rise to no pathologic process.

Clausen ridicules Igersheimer's attempt to explain the origin of interstitial keratitis by finding a single spirocheta in a section stained by Levaditi's method, since Walter Schultze and others have pointed out the frequency with which nerve endings and precipitates simulate the spirocheta when stained by this method.

*Clausen is of this belief himself.

According to present views, the dark field microscope holds the first place for the detection of the syphilitic organism. Against Igersheimer's finding, Clausen brings fourteen cases of interstitial keratitis in which he excised pieces from the cornea, and even with the dark field microscope was unable to find a single spirocheta.

It is claimed that experimental interstitial keratitis belongs also to the early stages of syphilis, and does not really represent the typical interstitial keratitis seen in humans. Furthermore, experimental insterstitial keratitis may be produced without the actual introduction of living organisms.

A. Leber produced interstitial keratitis by the injection of dead trypanosomes, also by the injection of trypanosome toxin.

Samperi reports experimental interstitial keratitis after injection of diphtheria toxin.

Wessely, von Szily,[3] and others have succeeded in producing, as an anaphylactic phenomenon, an inflammation of the cornea which greatly resembled human interstitial keratitis.

A further proof which seems also to strengthen the cause of the opponents of the direct infection theory is the very general resistance of interstitial keratitis to salvarsan and mercurials.

The endothelial theory originally set forth by Leber seems disproved.

Von Michel believed this process to be due to a disease of the vascular network surrounding the cornea, which has been found microscopically, and states that these changes represent a peri- and endovasculitis of syphilitic origin. Clausen believes this theory has much to recommend it.

As a result of his researches, Elschnig comes to the conclusion that interstitial keratitis is a degenerative disease and follows a disturbance of nutrition, due to a change in the fluids which nourish the cornea. He assumes toxins circulating in the blood, which also invade the corneal lymph and exert a "nutritive irritation" on the fixed cells of the cornea as well as on the vascular network at the limbus.

Guillery, from his experiments on the effect of ferments on the eye, has constructed an hypothesis on the following lines: That each poison has a selective action for some tissue, and that the toxin of syphilis has this affinity for the cornea; that in hereditary syphilitic individuals, for some reason, be it

through some cause in the general system or through a local cause in the cornea itself, such as a trauma, the vitality of the cornea is lowered, giving the toxin circulating in the blood its opportunity to act.

It is not beyond possibility that interstitial keratitis is an anaphylactic phenomenon.

Wessely injected one or two drops of sterile, inactive beef or horse serum into the corneal tissue. This was followed by little reaction, and all signs of the injection passed off after a few hours. Following this injection one of two things happened—either the eye did not react at all, or after a delay of twelve to fourteen days there came severe injection followed by a progressive opacity in the deeper layers of the cornea, sometimes with a deep vascularization. A further remarkable fact was noticed. At the time of the outbreak of this disease in the first eye, if a small quantity of serum was introduced into the cornea of the other eye, in twenty-four hours the characteristic interstitial inflammation developed, instead of in fourteen days, as in the first instance.

Von Szily and Arisawa repeated these experiments and enlarged them. The injection was made in the right eye. At the end of fourteen days, if the eye still remained quiet, a second injection was made in the same eye, which was followed in twenty-four hours by a severe interstitial keratitis with deep vessels, often circular pannus, hyperemia of the iris, and sometimes posterior synechia.

In a second series the first eye was injected, and at the end of fourteen days a second injection was given, this time 4 cc. of serum being introduced intravenously. Following this injection there was immediate, very noticeable contraction of the pupil, which lasted several minutes. In the eye previously injected there developed an interstitial keratitis at the end of twenty-four hours, or if an interstitial keratitis had already developed, it became more severe. Naturally, the left eye, which had been untreated, remained normal.

We know that in congenital syphilis spirochetæ wander into the cornea, usually, however, without producing a noticeable reaction. Their presence, or the presence of a luetic toxin, would be sufficient to sensitize the tissue. Now let us suppose, as does Guillery, that during some period, usually in childhood, the general resistance becomes lowered, be it

through poor hygienic surroundings or through some general infection such as one of the exanthemata or tuberculosis or through a trauma, the latent syphilitic virus will again become active, and the eye previously sensitized may speedily react to the increased quantity of syphilitic material in the circulation. Such an explanation has been suggested by Verhoeff[4] for phlyctenular disease.

In explaining interstitial keratitis, this is as far as we can go at present; but recent progress raises the hope that the problem is nearing its solution, and a solution is greatly to be desired, if only from the standpoint of treatment.

Treatment.—Interstitial keratitis is one of the most discouraging diseases which the ophthalmologist has to treat. Little benefit may usually be observed from the remedies employed, and when improvement occurs it is so slight as to be almost imperceptible. The disease drags on for weeks and months, and, most discouraging of all, the second eye becomes involved in spite of everything that can be done to prevent it, and the final outcome, often the material loss of vision, is most discouraging. Is it any wonder that we dread these cases in private practice, and that they excite less interest than they deserve at the hospital?

Long continued observation has shown that this lesion on the average is extremely backward in responding to the usual antisyphilitic treatment. The use of mercury and iodid appears in the ordinary case to have but slight influence on the progress of the disease. The advent of salvarsan was hailed with great joy, and when the wonderful improvement in the general symptoms of syphilis and in the eye, especially in syphilitic iritis, was observed, it was hoped and expected the same would be the case in interstitial keratitis. Unfortunately, this has not been true, and although a few observers have reported a marked improvement in certain cases, and though many have seen improvement in the subjective symptoms, yet, on the whole (and now a large number of cases are on record), the results are disappointing. Thus we must conclude that salvarsan has little local influence on interstitial keratitis.

The failure of salvarsan to act has been explained in several different ways. Igersheimer, supposing that the spirochetæ lie latent in the cornea from fetal life on, believes that they are probably so changed by the unusual conditions there that they fail to react to the drug.

Others have suggested that, owing to the avascular structure of the cornea, salvarsan does not penetrate to a sufficient extent.

Löhlein has disproved this to a certain degree. Following a suitable intravenous dose of salvarsan in rabbits, he was able to show arsenic in the cornea two hours following the injection and lasting up to eighteen hours. After a subcutaneous injection of double the amount, it was found in the cornea thirty minutes later and up to eighteen days.

Hata and others have shown the favorable action of "606" in experimental corneal syphilis, and the fact that a local reaction is sometimes seen in the eye after injection is further proof that the drug reaches the cornea.

Löhlein suggests an explanation of the action of "606" first set forth by Uhlenhuth, Lesser and others: that the virtue of salvarsan is not dependent on its direct ability to kill the spirocheta pallida but on its organotropic power; that is, the stimulation of cell activity and especially the production of antibodies. On this basis "606" might reach the cornea, but not be able to exert its full effect, since the corneal tissue possesses but a small ability to produce antibodies.

On the assumption that not enough salvarsan reaches the cornea, Löhlein in two cases of interstitial keratitis made repeated subconjunctival injections of a dilute neutralized solution of salvarsan, about one centigram of the drug being introduced at each sitting. He was unable to observe the slightest effect.

Recent investigations on the socalled meta- or parasyphilitic affections may have a certain bearing here, as many authorities have held interstitial keratitis to be of this nature. Evidence is now being brought forward to prove that some of these remote manifestations of syphilis bear a closer relation to the disease than had been previously thought.

We understand that Noguchi, in an investigation (not yet published in full) of 200 brains of general paretics, has found the spirocheta pallida in 48, and also in several tabetic cords. This work, confirmed, would seem to demolish at one blow the theory of meta- or parasyphilis.

Swift and Ellis,[5] also of the Rockefeller Institute, have devoted their attention to tabes. They point out the fact that the majority of cases show evidence of a localized meningitis

around the roots of the cranial and spinal nerves. Salvarsan, acting through the blood stream, works at a disadvantage on these lesions, since the main seat of the disease is surrounded only by lymph into which the drug is secreted little if at all. They point to the work of various men, especially Flexner,[9] showing that in order to obtain results from treatment of meningitis, the agent must be injected directly into the subarachnoid space.

There is evidence to show that the blood serum of cases treated with salvarsan has curative powers, and, acting on this fact, Swift and Ellis have injected salvarsanized serum into the spinal cord of tabetics, with a considerable degree of success, as indicated by the subjective improvement, by the disappearance or decrease in intensity of the Wassermann reaction given by the spinal fluid, by the marked decrease in the lymphocytosis, and by the considerable decrease in the amount of globulin present.

Their work is being taken up elsewhere, and in a verbal communication, Dr. J. B. Ayer, of Boston, tells me that he has had similar success in a small series of cases. It is too early, as yet, to judge of the ultimate value of the method.

In the hope that salvarsanized serum might be of benefit locally in interstitial keratitis of luetic origin, the writers have injected six cases during the past winter. The technic in the main was that laid down by Swift and Ellis. The patient received in the morning a full dose of neosalvarsan intravenously. After an hour blood was withdrawn from the patient into tubes, which were placed in the ice-box over night to allow the serum to separate. The serum was then drawn off and heated at 56° C. for one-half hour.

In our first case, it was then diluted to 40 per cent with normal saline solution, and .4 cc. was injected subconjunctivally close to the limbus bordering on that part of the cornea which showed the most active process. As the reaction from the injection in this case was nil, the serum from the next three was used in full strength, and .4 cc., .6 cc. and .45 cc., respectively, were injected. To the serum of case 5, 0.075 gm. of neosalvarsan was added, and .6 cc. was injected. It should be said that cases 1, 2 and 3 represented recurrent attacks of the disease. Case 6 differed in being an adult with an interstitial keratitis following an acquired syphilis. He received .7 cc. subconjunctivally.

For the benefit of future investigators it has seemed worth while to report these cases, although in none could the result be regarded as remarkable. There was no reaction from the injection, and in all the subjective symptoms seemed to improve, but it cannot be said with truth that the eyes have cleared any more rapidly as a result of the treatment. The greatest improvement was noted in the case of acquired syphilis, but here it might well have been due to the intravenous injection of salvarsan alone.

In spite, however, of the apparently discouraging results of antisyphilitic treatment, it is the duty of the ophthalmologist in all cases to do more than order local measures for the eye. He should see that each of these individuals is thoroughly treated for his general syphilis, of which the ocular process is but a part.

Just what method should be employed rests on individual preference and on the nature of the manifestations. One of the most effective and simplest methods is the administration of gray power (hydrarg. cum creta) in doses of from gr. ½ to gr. 3, three times a day, according to the age. This drug is well borne and easily administered, and may be taken for years without the production of untoward symptoms. In some cases it is wise to add a few injections of salvarsan or neosalvarsan, or to give mercury by intramuscular injection, or from time to time to add the iodids in suitable doses. But whatever method is chosen, continuity of treatment over years is of the greatest importance.

The iodids are of value in some cases for their tonic effect and for their apparent value in assisting the action of mercury, but it cannot be too strongly stated that in the light of present knowledge the treatment of syphilis, be it acquired or hereditary, is totally ineffectual with the iodids alone. Although the improvement in interstitial keratitis from the use of general antisyphilitic treatment appears in many cases to be small or even lacking, the writers are firmly of the opinion that the averge case reaches its termination in a somewhat shorter period of time than when antisyphilitic treatment is omitted.

It goes without saying that hygienic and tonic measures directed toward improvement of the general health are of the greatest importance.

There are other benefits, too, which result: improvement in general health is usually marked; other late lesions of the disease, such as those occurring in the brain and in the bones and joints, will largely be prevented; and recurrences in the eye, which are not by any means uncommon, will much less frequently occur.

It has been our experience in questioning a large number of cases to find that very few of them have followed out their treatment for any considerable length of time. In part, this is the fault of the specialist, who, when the diseased organ which he is treating clears up, does not insist on the necessity for further general measures. Often it is the fault of the parents and those in charge at home. The main fault, however, lies in our system.

These cases come to our clinics for eye treatment, and we forget that the ocular process is but a single manifestation of a general disease. We would not think of undertaking the general treatment of a case of albuminuric retinitis occurring in pregnancy; and it is little more logical for us to undertake the general treatment of syphilis since, in the nature of things, most of us can be but poorly equipped for the task. Our earnest plea is that all these cases when seen in the clinic should be referred to the expert on syphilis, and that when possible general treatment should be carried out by him.

Patients will not keep on going to the eye hospital after the ocular process has subsided, and in truth it is illogical to expect them to do so. Parents must be educated to the point of realizing that their children are suffering from a general disease of serious nature which requires years of treatment. Such education cannot be carried out if their attention is simply directed to the process in the eye alone.

Furthermore, we have come to realize the impossibility of handling these cases expeditiously and efficiently without the help of the social service worker. As in certain other chronic and recurrent eye diseases, it is most important to give frequent and continuous supervision and to visit these patients in their homes. This the doctor cannot do. Interstitial keratitis patients, like those afflicted with tuberculosis of the eye, and like the cases of phlyctenular disease, are well handled by the group or class method, and this, to a certain extent, has been instituted and successfully carried out in the Massachusetts Charitable Eye and Ear Infirmary.

During the past eighteen months many cases of interstitial keratitis have been placed under the supervision of a social worker, to whom they report on reaching the hospital. After receiving appropriate local treatment from the ophthalmologist on duty, they are conducted to the Boston dispensary, where they are taken in charge by the dermatologic and syphilis clinic, presided over by Dr. Abner Post and ably seconded by Dr. C. Morton Smith. The general diagnosis is made and treatment instituted. The patient is seen as often as necessary, and when the ocular process is healed the patient is not turned adrift, but continues under the best of general supervision and treatment.

The results of this combined treatment have been eminently satisfactory. It has seemed that our patients have shown more rapid improvement in the ocular process and especially in their general condition; and the patients themselves have greeted the additional care bestowed on them with enthusiasm and have been most faithful in their attendance. Thus systematic and continuous treatment is given to each case unless actually refused, and this has occurred in but one instance.

There is one other important feature to which we would like to allude. Syphilitic interstitial keratitis furnishes a great opportunity to the physician for public service. Each case represents an infected family. We should not be satisfied in providing treatment for the one member who presents himself at the hospital. We should go after that family, and we will frequently unearth other cases of hereditary syphilis, besides acquired syphilis of the father or mother. Many brothers, sisters and parents of our eye cases have been taken to Dr. Post and Dr. Smith for diagnosis and treatment, and it is sufficiently obvious how much good has thereby been accomplished.

The numer of our patients and of the families investigated is growing apace, and we hope in the not far distant future, with the cooperation of Drs. Post and Smith, to whom we owe our sincere thanks for the interest and time they have devoted to this work, to publish a more detailed account of the exact results accomplished by the methods herein described.

Our thanks are due to Drs. E. E. Jack, A. Quackenboss, and A. G. Morse for permission to administer salvarsanized serum to the six cases described in this paper.

LITERATURE.

All references given in this paper are to be found in the bibliography attached to Clausen's admirable paper, with the exception of those of Verhoeff, von Szily, and Swift and Ellis.

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XXVIII.

THE USEFULNESS OF DIONIN IN EARLY SENILE CATARACT.

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The annual deluge of new drugs, or remedies, since the days of synthetic chemistry, and of chemical juggling with things previously existing, is so great that it is only now and then that some one of them is proven to have traits and virtues not possessed by its antecedents, and worthy of confidence as a really new drug, and not some old one with merely a new name. Such an exception, however, has dionin proven to be. For some time it was known to the writer only as one of the family whose names ended with "in," and the prefixes of most of the others have passed into oblivion. About nine years or more ago, articles describing its specific lymphagogic action, and the great and immediate chemosis produced in those of certain diatheses, as the tubercular, influenced him to make use of it, and the prompt and almost invariable effects manifested, showed we had something quite as characteristically new and specific as were cocain or adrenalin. Continuance of its use seemed to sustain its claims as an analgesic and stimulator of reconstructive processes after ulceration, etc.

In so far as the essayist can remember, it was after between two and three years' use of dionin in its admitted fields of application that the idea that it might be of value in early senile cataract occurred to him. What others may have done in this line had not come to his knowledge, but it looked reasonable to think that the same line of observations would have led many to make the same trials, and an outlook was kept for articles on this subject, in such literature as he was conversant with, but they did not seem to be forthcoming in sufficient abundance that any reached his eye.

The only reference that can be recalled is the following, which also sets forth certain uses of dionin which will not, for this reason, be further dwelt upon in the body of this paper:

Journal American Medical Association, January 4, 1913, p. 69.

"To the Editor:

"(1) Please give me the consensus of opinion as to the use of dionin in absorption in the incipient stage of cataract. When and by whom was it first used?

"(2) Dionin has been prescribed for a patient of mine by a prominent oculist, and the result of its use has been most painful. She was told it would cause her eyes to smart and burn for a while after using it, but that this would wear off shortly. This, however, has not been the case; on the contrary, the use of it has caused the most decided pain and inconvenience. During the week prescribed by the oculist for the use of the drops in the eyes, she was not able to use her eyes at all, and the pain is just as severe now as when she first used the dionin in the eyes—five months ago. Can you tell me whether this is unusual or not? B. L. D."

"Answer 1.—The use of dionin in the early stage of senile cataract of the ordinary type dates from its first introduction by Wolfberg, under the name of "peronin," which he described in the third volume (1889) of the *Wochenschrift für Therapie des Auges.* Later when Merck introduced ethylmorphin hydrochlorid, under the trade name of dionin, displacing the benzylmorphin hydrochlorid or peronin, Wolfberg and others experimented with the new remedy in almost every disease to which the human eye is heir. Solutions (5 per cent to saturation) as well as the powder were applied to the conjunctival sac, for the dispersion of lenticular opacities. Darier (*Therapeutique Oculaire*) early employed this remedy, and believed that it was valuable, at least as an adjunct to other cataract absorbents. Casey A. Wood, in his 'System of Ophthalmic Therapeutics' (p. 759), expresses the belief that the most effective method of employment is by subconjunctival injection, but that it is extremely doubtful whether this remedy or any other has much effect in delaying the progress of the usual forms of senile cataract. Dionin is generally regarded as one of the most valuable analgesic remedies we possess, for

the relief and treatment of corneal ulcer, acute glaucoma, iritis, scleritis, and the other inflammatory diseases of the uveal tract. The relief given to the pain in most cases is prompt and complete. It may be used hypodermically (as an adjunct to atropin), but is commonly employed as a collyrium in 5 per cent and 10 per cent solution, or as a powder applied to the conjunctival sac. The greater the edema set up in this way, the more decided is the analgesic action of the agent.

"Answer 2.—There are few recorded ill effects from its local use, even when the conjunctivæ and lids are much swollen, or when the saturated solution or the powdered drug has been employed at intervals for a long period. Any departure from this result may be regarded as an idiosyncrasy on the part of the patient, or from the use of the drug in improper cases—although any serious therapeutic complication is rare. In other words, there is little or no danger from its use, even in large doses."

From the marked chemosis induced in many eyes immediately after use of strong solutions or the pure powder, it was concluded that dionin must have an effect on the lymphatic circulation and nutrition of the deeper structures of the eye not possessed by any previously known drug, and there seemed to be no dangerous effects associated with this potency. Time and again in such conditions as subsiding keratitis interstitialis, etc., the lower conjunctival sac was practically filled with powder, producing the desired intense hyperemia, with pain never lasting over a few minutes, and apparently never causing inflammation in the real sense. In a fair proportion of cases sneezing occurs within two minutes, so much so that it is often alluded to as the sneezing drops. If it is desired to allay or prevent the short irritation following its application, alypin is more effective than cocain; this seems to apply to the use of other strongly irritant applications to the eye or lids—the superiority of alypin over cocain.

In using dionin hundreds of times, in cases of corneal ulcer, iritis, keratitis, etc., I do not recall any one having persistent pain or irritability of the eyes after its use, and think the patient referred to in the *Journal* quotation must have possessed a peculiar idiosyncrasy or a very vivid imagination.

After making due allowance for the variability in the development of senile cataract, and recognizing the fact that

cataract sometimes progresses so far and then remains stationary the rest of a life time, it still seems warrantable to conclude, from the cases to be presented, that a much larger percentage has remained stationary than has ever been observed to occur spontaneously, and certain appearances in arrested cases indicate conditions which do not occur in untreated patients, thus justifying the hope that we have in dionin something long sought for in vain, that will arrest, to a demonstrable degree, the irresistible progress to blindness of the average cataract.

The course of an eye previously blinded by cataract is the most likely gauge of what its fellow eye will do when once the condition starts; likewise family tendencies, and to a certain extent general physical conditions. The limit of what has been considered worth while in formative cataracts by the consensus of authorities is restricted use of eyes, careful refraction, and keeping the system in best condition possible, with the stamp of professional endorsement on no drug or procedure for local use. In the cases reported herein, no attention was paid to the general conditions, and patients were permitted to use their eyes at their own free will. A few cases, after showing a temporary improvement, drifted back to the starting point, and then on into loss of vision, so it is not claimed that the treatment by dionin is an absolute specific. The strength of the solution and frequency of use was varied in different cases, as is proper with any treatment in an experimental stage. Most frequently a 4 per cent solution in cyanid of mercury 1 1000 was given; three drops in each eye daily. Some were told to use one drop three times a day; some, three drops once a day; some, to use it on alternate days, and sundry other variations as to time and strength. Some have used it daily for years without fail, some intermittently for years, some continuously for several months and then discontinued. Up to the present no conclusion has been reached as to the best strength, the proper frequency, or whether using a certain time and leaving off periodically or permanently is best; but one fact stands out boldly—it is worth while using some and for some time.

A classified list of these cases was not kept, and several instances which had passed out of memory when they returned, were found, on looking up the record, to be good

demonstrations that the loss of vision had ceased with the beginning of treatment, some showing betterment after years. In only one instance was the dionin given subconjunctivally, which but for its severity would no doubt be more efficacious than by drops. This was an old man who had lost one eye following cataract extraction, and it was explained to him that the injection was to tone up his remaining eye so it would more likely resist infection following an operation, which operation was considered inevitable. Following an injection, the same as is used in routine procedures, severe enough to require the dionin, cyanid of mercury, etc., as outlined by the author in paper presented before the section, American Medical Association, 1912, sight rose from fingers at one foot to fingers at three feet, and justified a repetition of injection at expiration of one month. This caused vision to raise to fingers at seven or eight feet, and for a time patient could do simple farm duties, but the improvement did not hold, and case was operated on at end of three or four months, without any mishap following.

No raise from use of drops has ever been observed in any case where large letters could not be read, and the temporary raise here from injection, as far as one case goes, might indicate the proportionate value of injection in the early cataracts, where reading is still possible. One case of decided improvement from subconjunctival injection of dionin was reported by E. J. Bernstein, more than five years ago.[1]

One characteristic of dionin is that people do not become insensitive to it from long use; it smarts just the same after the hundredth or thousandth application as after the first, but the smarting always passes very quickly. Subjects in whom it produces much chemosis cease, however, to have that manifestation in time. Those with what our fathers called the strumous diathesis, have so much swelling as to close the eyes, and woe be to the doctor who fails to tell them in advance to be prepared for such appearances.

1. Since this paper was put in hands of the publisher, a man, aged forty-seven years, with vision fingers at 6 feet, no Jaeger, each eye, was given injection in one eye, and as soon as swelling subsided sufficiently to permit its being held open, which was three days, the injection was given to second eye. He was under observation ten days, and sight in each attained 20/70, J. 14, near. He went to his home, several counties away, and a letter of inquiry was answered two months later, by his son, saying the father was nearly blind.

A letter of inquiry to Merck & Company elicited the fact that dionin, as indicated by its chemical name, is made from morphin, and is not a synthetic; the question of its equivalent in terms of morphin was not definitely answered. The old writers on eye diseases set great value on diluted tincture of opium as an eye wash in indolent conditions, which may thus have presaged the dionin effect to a small degree.

Several cases in which an improvement was noted are not included in reports, because they could not be reliably followed sufficiently long. The first record available is:

Case 1.—Mrs. V., aged 58 years. October 1, 1906. For several months has had increasing difficulty in reading papers. Wearing: Right, cyl. — 2.75, ax. 15°, V. = 18/50; left, cyl. — 1.62, ax. 0, V. = 18/40. Peripheries of lenses opaque, with spicules running into central area. Prescribed dionin, grains five; aq. destil., drams two; two drops in each eye twice a week. August 6, 1909, glasses: Vision each = 18/40 plus. Add S. + 5.0 D. Right reads J. 2; left, J. 1. Drops have been used fairly regularly. August 1, 1912, right, same glass, V. = 18/50. Left, no glass, V. = 18/30. Cyl. + 0.50, ax. 90°, clearer. Add S. + 3.0 D. Right reads J. 4; left, J. 2; together, J. 1. Only one quadrant of pupil area clear by reflected or red by transmitted light. Sharp limitation of opaque areas as defined from clear. Quite recently her son reported she is still able to read a city daily which is much criticised for its fine type used.

Case 2.—Mrs. W., aged 64 years. January 10, 1907. Has for several months been unable to read papers, except coarsest prints. Right, V. = 18/160 +; J. 12. Left, V. = 18/80; J. 10. No increase by glasses, far or near. Incipient cortical striated cataracts. Prescribed dionin, grains six, aq., drams two; drop into each eye daily. May 30, 1907, reads morning and evening papers readily with S. + 4.0; right, J. 5; left, J. 2. Distance: Right, V. = 18/120; left, V. = 18/80. August 17, 1907, still as good. November 30, 1908, right, V. = 18/120; S. + 5.0, J. 4 plus; left, J. 1 partly. Striations, etc., in lenses quite light, and optic discs seen very clearly through certain parts of lenses. February 21, 1913, fundus perfectly clear, undilated pupils both eyes. Right, V. = 16/200; left, V. = 18/80 minus. While eyes are hyperopic to about 3.0 D., glasses do not benefit. S. + 7.0, left

reads J. 3. Still reads papers with ease. Opaque spicules in lenses sharply defined; no haze around them. As there are fewer in right than left eye, and its vision is lower, the cause is likely in the optic nerve. Both discs are perfectly visible and look white and atrophic, for which patient was prescribed increasing doses strychnin sulphate. The lenses look clear enough to permit a much higher vision. Drops have been used on an average of three weeks out of each month since first prescribed. This is the only case in my experience where a reading vision which has been lost was restored to last. There have been some cases presenting a temporary restitution, but it did not hold long in the others.

Case 3.—Mr. K., aged 59 years. January 21, 1907. Right, V. with S. + 0.50 ⌒ cyl. + 0.75, ax. 0° = 18/30; left, V. = 18/80. No glass raises. S. + 4.0. Right, J. 2 easily 13 inches; left, V. J. 5 13 inches. Dense cortical opacities each eye. Left pupil sluggish to light. Gave dionin grains six to water ounces one. Use in each eye t. i. d. July 15, 1907, replies to query that he used one and one-half ounces of drops. Sight no worse. Sends sample cut from magazine very fine print for right, coarse for left. October 3, 1912, has used up to past six months. Right, S. + 0.75 ⌒ cyl. + 0.75, ax. 45°, S. V. = 18/20; S. + 4.0, reads now J. 1 easily. Left, vision fingers at two feet. Dilated pupils. Right central area clear; dense streaks sharply outlined, in periphery. Left, red fundus reflex gone. Homogeneous opacity entire lens. March 2, 1913, replying to query, enclosed from magazine advertisement type even finer than J. 1, which he can read by straining; reads J. 2 with a little effort, and J. 6 with perfect comfort. Uses drops twice a day. Left, vision reduced to finger motions.

Case 4.—Mrs. ———, aged 52 years. September 17, 1907. Left eye bad for several years. Right eye failing much recently. Right, V. = 18/30; J. 2 sixteen inches; S. + 2.0, J. 1. Only lower nasal quadrant pupil open to light, balance dense opacity. Left pupil entirely white. Vision, fingers at five feet; J. 14 partly at four inches. Gave dionin 4 per cent, three drops once daily in each eye. November 25, 1907, right, V. = 18/30; J. 1 by effort. Left, Vision, fingers at five feet. No change either eye. April 21, 1908, right, V. = 18/30; J. 1 with S. + 2.0. Left, vision, fingers at five feet. Her father

went blind with cataracts, and was successfully operated upon. Because of peculiar circumstances, it is impracticable to test present conditions, but patient still has drops used regularly, can recognize persons a hundred feet off, reads the daily papers some, and is an enthusiastic participant in card parties and social functions, without apparent handicap from defective vision.

Case 5.—Miss B., aged 69 years. February 13, 1908. Last four or five years sight has been falling off; how much due to lack of glasses, and how much to clouding eyes, not known. Vision each eye, 18/80 poorly. No raise by glasses; S. + 4.0, Jaeg. No. 3. Dilated pupils with cocain and euphthalmin. Marked cortical opacities surrounding pupil area, with a few spicules in same. Gave dionin, grains twenty to aquæ ounce one, three drops once a day, to see if it would prevent progress. April 28, 1908, has been using in right eye only. S. + 1.12, V. = 18/40; S. + 5.0, J. 1 clearly. Left, S. + 1.12, V. = 18/40; J. 1 by effort. Prescribed drops in each eye on alternate days. Optic discs both eyes perfectly visible. February 13, 1909, right, V. = 18/60 plus; glasses, V. = 18/30. Left, glasses, V. = 18/40 —. Add S. + 4.0, both eyes read J. 1 on cloudy day. May 20, 1911, has used irregularly. With glasses vision each eye, 18/40 plus. November 25, 1912, with S. + 1.50 each eye, right, V. = 18/30; left, V. = 18/40; S. + 5.0, right J. 3; left, J. 1. January 21, 1913, glasses each eye slightly better than last test for far vision; S. + 5.0, J. 2 each; J. 2 + jointly. Spicules throughout lenses clean cut, with interstices clear of haze, like looking through a leafless thorn bush or thicket.

Case 6.—Mrs. C., age 63 years. April 7, 1908. Sight rapidly declining lately. Vision each eye = 18/50 +; S. + 1.0 each = 18/40 +; S. + 4.0, J. 1 by effort. Slight haze in lower quadrants both lenses. Prescribed dionin, grains eight to aquae, ounce one-half, three drops daily at one time in each eye. February 17, 1909, has not been using drops regularly. Eyes test same. Restored regular use drops. February 28, 1910, right lens looks more brushy, but glasses give 18/40 plus; J. 2. Left lens much clearer. Glasses, V. = 18/20; J. 1 partly. March 6, 1913, examined at patient's home, test chart on wall lighted by chandelier in center of room, and probably a lower vision than would have been obtained at

office with light nearer chart. Right, V. = 12/40; left, V. = 12/30 minus. With her glasses about S. + 5.0, reads finest print cut from magazine advertisements, corresponding to J. 2. Because of severe reaction from drops, chemosis and swelling lids, she used only two bottles and has not repeated for a long time.

The question as to whether using the drops a certain length of time, and then omitting them altogether, or using throughout life, if vision for reading is preserved, is the better practice, is one that will require more extended observation than has been my privilege. Patients have been advised to continue throughout life as being on the safer side, inasmuch as no harm has appeared to come from regular use. If, as elsewhere mentioned, cataracts be considered the result of a pathologic process as uveitis, or low grade choroiditis, or lymph statis, or toxemia, with senility as a predisposing factor, then it may be that the abatement of these conditions stops the progress of their effect as manifested in cataract. Senility itself certainly goes steadily marching on.

Case 7.—Miss J., age 76 years. November 27, 1908. Sight failing for a considerable time. Vision each eye = 18/80; S. + 0.75, V. = 18/50; S. + 4.50, J. 4 each eye. Euphthalmin mydriasis; lower half lenses diffused clouds, upper quite clear. Fundus normal. Prescribed dionin, grains ten to aquæ ounce one-half, three drops daily. November 11, 1912; used for a long time and then quit. Absolutely no change since record in sight or looks. March 3, 1913, in response to letter of inquiry, says she can read *Baltimore Sun*, but it soon tires the eyes. Can read *Cumberland News* for one hour at a time. The *Baltimore Sun* uses a finer type than the average daily. She gives this family history as to cataracts: In 1850 an uncle was operated on in Philadelphia by Dr. Pancoast, with failure; later another uncle operated on in Baltimore by Dr. Smith, with success; fifteen years ago a brother operated on in Baltimore, with failure to recover sight. With this record, her cataracts surely must have gone to blindness but for dionin.

Case 8.—Mrs. S., age 65 years. March 8, 1909. Sight failing in spite of glasses past three or four months. Wearing S. + 2.0 each eye. With right, V. = 18/80; left, V. = 18/120 minus. Using near S. + 5.50, right J. 4; left, J. 8. Dilated pupil with euphthalmin. Cross striations in both

lenses, entire diameter, with distortion effect on focus. Put on dionin, grains ten to aquæ one-half ounce, three drops each eye at night. March 27, 1909, same glasses, right, V. = 18/80 — 18/40; J. 3; left, V. = 18/80, J. 4. May 17, 1909, test same, uses eyes quite well. April 20, 1911, vision slightly raised in both eyes. February 18, 1913, flaws in lenses hardly detected by reflected or transmitted light. Optic discs both eyes perfectly clear. Right, V. = 18/50 plus; S. + 7.0, J. 2; left, S. + 3.0, V. = 18/80 plus; S. + 7.0, J. 6. Has used drops between one-fourth and one-third of the time, intermittently. The opacities are sclerosed, causing irregular refraction.

Case 9.—Mrs. B., age 63 years. November 30, 1909. Wearing bifocals each S. + 1.50 and + 4.0, with right V. = 18/120—18/50, J. 6; left V. = 18/50—18/40; J. 3. Right, S. + 0.50 ⊃ cyl. + 1.0 ax. 75°, V. = 18/40. Add S. + 4.0, J. 3. Because of streaks in each lens used homatropin. Right tests same. Left, S. + 0.75 ⊃ cyl. 0.75, ax. 135°, V. = 18/40 clearly. Add S. + 4.0, J. 2 easy. Distinct white streaks in each lens. Choroid very fluffy and red. Put on dionin, grains eight to aquæ dist. half ounce, three drops nightly in each eye. December 24, 1909, writes drops burned and glasses felt queer at first, but is pleased with results. August 4, 1910, writes eyes got on well as long as drops lasted; now can hardly read the paper and eyes cramp. Gave alypin ½ per cent, acid boric 2 per cent and dionin 3 per cent. December 7, 1910, writes cramps are relieved. March 29, 1912, vision raised in each eye, far and near. Opacities less. Refraction unchanged. Advised to use drops always. February 20, 1913, in reply to letter, says eyes are good as ever. Marks clipping for each eye J. 2 at twelve inches and 20/40 far.[2]

Case 10.—Mrs. T., age 62 years. March 3, 1910. Right, S. + 1.0, V. = 18/40; S. + 3.50, J. 3, thirteen inches. Left, V. = 18/200 dimly, J. 12. No raise by glasses, far or near. Cataract tongues in lens, converging to center like spokes in wheel, only the hub (center) being clear. Prescribed dionin drops. April 1, 1910, slight improvement far and near. No-

2. This patient was seen on June 7, 1913, after paper had been sent for publication. Eyes test a little better than above on far, and near J. 1 each. No haze in lenses. Sharply outlined original heavy streak. Fundus absolutely clear in both eyes. Dilated pupils show no haze. Glasses unchanged. Pinhole added each 18/30+. Uses drops regularly.

vember 21, 1910, hasty test, right, V. = 18/40; S. + 3.50, J. 2 plus; left, S. — 1.50, V. = 18/80 plus; S. + 3.50, J. 6. Fundus perfectly visible both eyes, between striæ. December 9, 1910, returned for an episcleritis in left eye. Vision rising. March 5, 1913, replies to letter of inquiry that the drops have done a great deal of good and she tries to never be without them. Marks on sample card for what she can read with her glasses, at twelve inches, a type for right eye corresponding to J. 3—4; for left, J. 4—6. Far test not given.[3]

Case 11.—Mr. F., age 84 years. July 13, 1910. Sight has failed beyond reading. Right, V. = 4/200; S. + 7.0, J. 12; left, V. = 6/200; S. + 7.0, J. 12. No raise far. Is strongly hyperopic. Right, faintly nebulous lens next to capsule; left, denser, with webs in anterior vitreous. Prescribed dionin, grains eight to aquæ one-half ounce, one drop three times a day in each eye. July 30, 1910, right tests same on far; left, 15/200—15/120, S. + 7.0, together Jaeg. 6. September 14, 1910, right, S. + 5.0, V. = 18/120; left, V. = 18/80; S. + 9.0, J. 6. February 5, 1913, used several bottles, then quit. Through small pupil right fundus clearly seen; left, not. In addition to his age he is an inveterate smoker, which probably explains much of his dullness of sight. Does not try to read papers, but plays dominoes nightly, and gets around on the street as briskly as those who have the best of eyes. Dilated pupils with euphthalmin. Right pupil requires care to see any opacity; fundus absolutely clear. Left lens, lower half, full of scratches, but perfectly clear above. Right, V. = 10/120; left, V. = 6/120. No raise with glasses. S. + 9.0, right, J. 6; left, J. 8 at eight inches.

Case 12.—Mr. G., age 92 years. November 14, 1910. Left eye gone entirely blind recently with amber cataract. Recognizes light down and out, but not up and in. Cannot distinguish two candles at once. Iris yellowish. Right iris blue. Fundus normal. Opalescent radiations entire lens. V. = 18/160, J. 4 at 10 inches; S. — 2.0, V. = 18/80 +; S. + 1.0, J. 3 easily. All his life read fairly well without glasses, or equally well with anybody's glasses. Tests eight to ten years ago showed myopic astigmatism, correction of which gave somewhat below normal standards. Fields good down and

3. Since sending in paper patient was seen, and these notes taken: Lenses clearer between striæ. Right can get with glasses 18/30+, J. 1 partly; left, 18/160, J. 3 partly.

out but almost lost up and in. Put on dionin, grains eight to aquæ ounce one-half, three drops daily in right. December 14, 1910, appreciable raise far and near. S. — 2.0, V. = 18/50 —; strong + S., J. 1 —. March 11, 1911, vision same as last tests. December 2, 1911, S. — 2.0, V. = 18/80-18/50; S. + 3.0, J. 1 minus. Has typical glaucoma; left anterior chamber obliterated, pains, hardness, etc. Prescribed eserin sulph., 1/16 grain to one ounce of 1/4000 epiniphrin hydrochl. (adrenalin). February 24, 1913, left pains ceased. Eyeball very hard, no anterior chamber, and vessels growing in cornea. Right pupil small, slight movement to light, tension normal. No glass reads J. 3; S. + 2.0 reads J. 2 +. Far vision, 18/120. In view of the complete destruction of left eye by cataract and glaucoma, and extreme age, now 95, it is highly probable the right would not have fared other than badly but for the stimulating effects of dionin on its nutrition.

Case 13.—Mr. B., age 68 years. January 21, 1911. Left eye failing past six years, right past few months. Wearing S. — 3.0 for distance each, being the myopia of second sight, as he was fitted by me in October, 1896, to plain presbyopic glasses; eyes normal. With far glasses, right, V. = 18/120 plus; left, V. = 10/200-10/160. No glass helps near. Right, J. 6 by effort; left, J. 14. Dilated pupils with euphthalmin; no raise in sight. Incipient nuclear cataracts both eyes, white by reflected and black by transmitted light. In right small spot old choroiditis in periphery; left, distinct floating spot on string in vitreous, noticed for years. Put on dionin, grains eight to aquæ dest. one-half ounce, three drops each eye at night. March 18, 1911, with myopic glasses right vision raised to 18/50; left to 18/160. No glass, right J. 4 easily; left, J. 10. May 23, 1912, right, no glass, J. 4; left, J. 14. February 18, 1913, by reflected light, both pupils opalescent not white; by transmitted light, periphery clear, centers translucent, not dark or black. The formerly opaque white nucleus is now sclerosed and transparent, but of exceedingly irregular refraction, to which I attribute the reduced vision more than to any opacity of lenses, which can hardly be said to exist now. Right, vision with S. — 3.0 = 18/50 plus. No glass, reads J. 3; pin hole, J. 1 minus. Left, with pin hole, V. = 18/80; J. 3. Has never failed in daily use of drops. In each eye the sight is better than when starting the drops

two years ago, and the clear sclerosis of lenses has replaced the opacities. My opinion is that this case will not backslide in time to come.

According to Treacher Collins, "the hard sclerosed nucleus of the lens has little tendency to undergo degenerative changes which result in the formation of opacity; it frequently remains clear and unaltered when the whole cortex has become opaque." Having been arrested as a case of nuclear cataracts, it is not likely to try to get there a second time by the cortical route.

Case 14.—Mrs. D., age 59 years. April 13, 1912. Right eye failing past six months. Vision = 18/200; J. 14. No raise glasses. Fundus invisible. Left, V. = 18/160. S. + 2.0, V. = 18/30; S. + 5.0, V. = J. 4—6. Dilated pupils with euphthalmin. Right dense center, and dusty periphery of lens, fundus dimly seen, but healthy. Left, outer area of lens, posteriorly a blotch as large as average pupil, otherwise perfectly clear. Put on dionin, grains eight to aquæ ounce one-half, three drops in each eye daily. July 7, 1912, right same. Left, vision without glasses, 18/20; J. 1 partly. March 7, 1913, right, vision fingers at three feet. No J. Left, vision without, 18/50 minus. Raised by glasses to 18/50 plus. Pin hole, some letters to 18/30, and J. 4 minus. With S. + 5.0 reads J. 1 partly. Dilated pupils with euphthalmin. Right fundus not visible. Left, large splotch posterior capsule up and out, nearly transparent, however. Rest of lens perfectly clear. Has used drops regularly, and they burn just as much today as first day of using.

Case 15.—Mollie J. (colored), age 56 years. April 25, 1912. Sight affected several months. Vision, each eye, 18/30. Lower third lenses each eye entirely opaque, balance clear. Right, cyl. + 1.12, ax. 25; left, cyl. + 1.25, ax. 0. V. = 18/30 clearer. S. + 2.50 added, J. 2. Put on dionin, grains eight to aquæ dest., one-half ounce; three drops each eye daily. July 31, 1912, vision each eye with above glasses, 18/20 minus. Add S. + 3.0, J. 1. February 20, 1913, same as last tests; lower portions pupils perfectly opaque, upper perfectly clear. Uses drops every day.

While the doctrine that senile cataract is analogous to the turning gray of hair with age, and occurs in healthy eyes even as gray hair with healthy bodies, has been preached for generations, I prefer to follow those who challenge this explana-

tion, and say that the cataract is the result of disease to which senility is merely a predisposing cause, just as certain conditions in childhood predispose to things which may also occur in older age. Cataracts following recognized uveitis or choroiditis are not rare. It is probable the average cataract may result from nutritional disturbances from a choroiditis or uveitis passing unobserved, or of such low degree as not to be manifest, unless the fact of cataract itself be construed as a symptom. Not many years back, Graves' or Basedow's disease was recognized only when goiter and exophthalmos were present. Now since the term of hyperthyroidism may be considered to have supplanted the honored names of Graves and Basedow, it is known from the rapid heart, failing strength, nervous and trophic changes, without the big neck and popped eyes.

So, even, may it not be that cataracts may come to be a symptom of otherwise nonmanifest uveitis, choroiditis, toxemia or lymph stasis? We have no end of writings on congestion or stasis of the hemic vascular system, but little on the lymphatic circulation. Reasoning backward from effect to cause, should extended trial by the profession sustain the hope that dionin does arrest a good proportion of cataracts, when used sufficiently early, then we may conclude that it was by removing a lymph stasis or by improving ocular nutrition, or breaking up a low grade uveitis or choroiditis, that the lens substance was made able to retain its transparency against the conditions tending to destroy it. I am not seeking, however, to establish a theory, but to demonstrate a practice which is to be judged by its results, and not by any theory offered in explanation. The sclerosed nucleus, the sharp, clear cut definition between the opaque and transparent areas in the cases reported, I have not observed in untreated cases.

In closing, I wish again to emphasize that it is in the early stages of cataract formation, with ability to still read coarse prints, that we may hope to arrest the progress of the affection, and that it is not claimed to absorb formed cataract, or even to be worth trying in the advanced cases. Lens cells advanced beyond a certain degree of opacification cannot be made to clear up, but it seems that this is preceded by a haziness as it extends, which can be made to clear up and act as a barrier against the further progress of degenerative changes which make the difference between opacity and transparency.

XXIX.

THE PREVALENCE OF OPTICIANS' MISTAKES.

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AND

Albert C. Durand, B. A., M. D.,

Ithaca.

The greater teachers in medicine constantly endeavor to instil into the minds of their pupils a realization of the benefit to be derived from taking nothing for granted, and that they should prove the truth or falsity of a proposition before accepting or rejecting it.

In recent years there has been much discussion concerning the purity of the products of chemical manufacturers. Until the development of the excellent work done by the Council on Pharmacy and Chemistry in bringing to light irregularities in drug products, all assumed that statements made by drug houses regarding their own products were correct. Investigation has shown that this assumption is sometimes erroneous.

In the optical world it is an every-day occurrence for patients to go from one refractionist to another because the relief expected was not obtained by the glasses given. Is it not common for a careful ophthalmologist, even by repeated efforts, to fail to overcome symptoms which evidently seem due to eye strain? The question arises: Is the fault in the prescription, or is the failure due to error in filling the prescription? Have we been so sure of the accuracy of optical

productions that we have considered investigation unnecessary; or have we been so occupied in other ways that we have been willing to take it for granted that a lens is accurately ground and correctly fitted; or have we so little faith in the actual value to the patient of our own prescription that we are indifferent as to the exactness with which it is filled?

Arguments have been and will continue to be advanced against the value of absolute accuracy in optical production. Most of these reasons are really excuses rather than arguments, and others show an indifference or ignorance as to the intended usage of lenses.

For example, some men maintain that the oblique muscles, by rotating the eyeball on its longitudinal axis, can take care of considerable error in the grinding of the cylinder axis. This may be true in many cases; but one of the chief reasons for using cylinders is to remove the muscular fatigue resulting from an effort to overcome the irregularity in curvature or density of the refractive media; and when the cylinder is not prescribed closely and ground accurately, the fatigue is simply shifted from one place to another and eye strain persists instead of being relieved. The same applies to the insertion of prisms through decentering. We will all admit, however, that vertical prisms, when not ordered, are much more harmful than prisms base in or out, because of the variability in pupillary distance and the normal difference in power between the elevator and depressor muscles, as compared with the lateral rotators. But this difference in normal muscular power is no more excuse for horizontal than for vertical decentering, since an undetermined prism may often thus be placed in the way of a weak lateral muscle.

Another claim frequently heard is that accuracy is not worth while, because few patients keep their glasses straight for any length of time, and that, if the grinding and adjustment are near enough to obtain what appears to be a fair result, we should be satisfied. This is really a travesty on the veracity of the profession. If we belong to that group of traders known for "just as good as" productions; or if we are willing to tacitly smile at substitution in optical prescription work and in the same breath cry "fraud" against the drug substitutor; or if we have no jealousy for our own prescriptions, then the above claim passes without further discussion.

But if we are the contrary of all these, and if we believe that all good results might perhaps be more successful, and if we accept the responsibility of doing our best for the patients who come to us, we will then see to it, not simply that the prescription is as good as we can make it, but also that it is filled with such accuracy that the patient is at least started off with the best man can produce. We have no right to maintain because the patient is wearing glasses without benefit—even if the prescription is our own—that therefore the functional disorder we hoped to correct does not come from the eyes, until we have repeatedly gone over the refraction, and unless every lens ordered for him is known to be accurately ground and correctly fitted. Practically all errors hereinafter shown are enough to spoil an otherwise good prescription for many patients. While there is a great variability in the sensitiveness of patients, and while the power of suggestion probably plays a part with some patients in the benefit derived from glasses, neither of these factors should ever be used as excuse for careless work. Abundant evidence is at hand to show that patients can be instructed how to determine when their mountings are bent, and when anxious to obtain the best possible results they are easily persuaded to call upon either oculist or optician for readjustment.

Refraction is a scientific art, and in our prescribing we are guided by a number of interdependent elements; but the filling of that prescription is based on an exact science, and our experience goes to show that any decent optician can fill prescriptions accurately if he takes the time and trouble. One optician doing a big business in New York City has been quoted as saying that it does not pay him to take the trouble to turn out accurate work. If a few of his medical patrons were to adopt the following suggestions, he would soon be forced to do accurate work or go out of business.

That absolute accuracy is practically as well as scientifically worth while is being demonstrated daily in the practice of those men who are not satisfied with any inferior work. A number of cases have been seen by us in our separate offices in which no change was made in the former prescription, but the old lenses, which were in error, were replaced by accurate ones, or maladjusted mountings were accurately adjusted, and the situation changed from failure to success. Many patients, after several weeks or months of comfort with well made

glasses, return with the complaint that their troubles have come back. Sometimes the prescription needs changing, but more often the difficulty is a mounting bent five, ten, or fifteen degrees, and a week's trial of the readjusted glasses usually brings a report of return to comfort, at times even when the spheric and cylindric corrections are surprisingly low.

When lenses are still uncomfortable (this should be differentiated carefully from an irritative mounting) after five or seven days' constant use, it usually means either that the prescription was wrong or the lenses poorly made or improperly adjusted, or, in a few cases, that the eyes have changed in the meantime. (This last is even more likely to be the case if eserin was used as a myotic after cycloplegia.) With few exceptions patients should not be expected or required to take three or four months, or as many weeks, to "get used" to a pair of glasses, before the reason for the discomfort is sought, located, and rectified.

Following the lead and advice of older colleagues, we began our studies in the accuracy of optic production in 1909-1910. We have checked in detail the amounts, cylinder axes, and optic centers of all lenses coming under our observation. In this work we have used accurate trial case lenses and the "Geneva lens measure" for neutralizing and measuring the actual spheric and cylindric amounts, and the "Standard axis finder and centering machine" for determining the exact axes and optic centers of lenses seen. We regret that our earlier efforts were merely devoted to obtaining accurate prescriptions for individual patients and that no record of errors was kept, as otherwise our contribution would cover several times the number of lenses herewith presented.

In 1911 one of us reported the situation as found to date. The sum total of this is contained in the quoted paragraph: "There exists today in the world of optic production a condition calling for house cleaning and revolution just as strongly as any call issued in the past for better medicine and surgery. It is a condition calling for action along the same lines as the exposures by the Council on Pharmacy and Chemistry of errors in strength of drugs put out by reputable drug houses. It is, in short, a condition of inaccuracy in the products of many optic houses and many opticians, and the failure on the part of many oculists to recognize these inaccuracies when they exist."[1]

We find in the literature only two other professional con-

tributions referring to optic production. "Perfect Optical Work,"[2] by Dr. W. M. Richards, of New York City, and "Eye Strain,"[3] by Dr. George H. Wright, of New Milford, Conn. Dr. Richards speaks of the existence of inaccuracy in lens grinding, and suggests a mode of procedure by which accurate work can be obtained. The advice given is good, but perhaps too much stress is laid on the necessity of following a particular method, for it does not matter, of course, what method or what machinery is used, provided the finished product will stand any scientific test as to its accuracy. Several pseudoscientific articles on optic productions, written with excellent intentions and containing much truth, have appeared in various lay periodicals of late, but any good qualities included were lost to the profession from lack of scientific evidence and backing.

In January, 1912, it was decided to undertake an investigation of general optic productions which would stand scientific scrutiny by recording the comparison between the prescription given and the lens ground. With this in view, Dr. Hartshorne wrote to twelve ophthalmologists for their attitude toward such an investigation, and asked them to furnish lenses with the prescriptions for examination and record. Each of the twelve heartily favored the idea, and nine of them supplied some material. The rest of the material was obtained from patients coming for change of glasses, who happened to have the prescription for the glasses they were then wearing.

The purpose of this investigation and the attitude in which it was approached are shown in a paragraph of the letter addressed to the twelve oculists: "Since it has seemed rather difficult for most oculists to accept as true the statements I made in 'Accurate Optics,'[1] I am now gathering material for another paper to demonstrate more conclusively, after wider investigation, the truth or falsity of my present attitude regarding optic productions. My records show an error in nearly fifty per cent of the lenses seen, and I trust that further inquiry may reduce this percentage. I am not raising the question as to what the prescription should or should not be, but believe that I can show the existence of a removable error in filling many prescriptions, regardless of the reputation of the optic house in question. If further investigation proves a high degree of accuracy, no one will be more pleased than I; and if it proves the contrary, the findings should be of benefit to both patients and oculists."

The twelve physicians to whom we are indebted for this moral and material support are: Eilice M. Alger, M. D., New York City; Chester T. Cadwell, M. D., Poughkeepsie, N. Y.; Marguerite S. Cockett, M. D., Boston, Mass.; Colman W. Cutler, M. D., New York City; Thomas Dixon, M. D., Brooklyn, N. Y.; Norton DeL. L. Fletcher, M. D., New York City; Nathan Goodfriend, M. D., New York City; Allen Greenwood, M. D., Boston, Mass.; Charles P. W. Merritt, M. D., Clifton Springs, N. Y.; W. I. Neller, M. D., Middletown, N. Y.; S. W. S. Toms, M. D., Nyack, N. Y.; Geo. H. Wright, M. D., New Milford, Conn.

Others might be added who would gladly second such an inquiry, and one of these will be quoted later. While we wish to express our appreciation of the assistance thus rendered, we do not in any way intend to involve any of these physicians in any controversy.

In the ways stated above, three hundred and fifty lenses were collected and recorded by Dr. Hartshorne, this group forming the basis for the investigation into optic productions at large. These lenses were not selected in any sense of the word: but, aside from those furnished by physicians, every successive lens seen after January, 1912, was included. No lens was used for which the prescription or a copy of the prescription was not obtained, and in this group no lens was used which had been ground for either of us by our regular opticians.

Since, so far as we could learn, no standard has been set with which we could compare our findings, Dr. Durand furnishes as a control a series of two hundred and fifty lenses ground for him by his optician in the ordinary course of practice. We established our control from this source because careful methods are used in this shop, and all lenses are ground with the optician's knowledge that they are to be examined by Dr. Durand before the patient wears them and, if found in error, are to be replaced by the optician. We wish to emphasize here, as well as later, that while the control shows a much lower percentage of error than the general group, and while the percentage of error is much higher than it needs to be, yet none of the errors was worn by any patient, inasmuch as the oculist who wrote the prescription rigidly inspected every lens. On the other hand, with one or two exceptions, every

error shown in the general group had been worn by a patient for a shorter or longer period.

The prescriptions in the general group were written by thirty-eight physicians, many of whom are widely known as careful workers with high professional and scientific ideals. These prescriptions were filled by forty-five opticians, of whom twenty-five are in New York City and twenty in other cities, including Boston, Chicago, Philadelphia, London, and other optic centers. Each of these firms is well known in its own community, and many of them have national reputations. No one optic house ground over sixty-nine lenses (prescribed by three physicians), and no optician who ground ten or more lenses showed an error greater than sixty-three per cent.

We wish to dispel at once an idea evidently held by some oculists that the accuracy of the axis of the cylinder and the optic center of a lens cannot be determined unless the lens is seen on the patient, as its adjustment to the face might account for the way it is ground. Following careful study, and after conversation with several of the best opticians in New York City and elsewhere, we are prepared to brand this idea as untenable. The only exception to this would be a definite decentering in or out to meet a required pupillary distance with a certain size of lens. Such a necessity is rare and is considered by the better opticians as bad practice, and, as will be seen in Appendix I., does not need to come into consideration in this paper.

Lenses are ground, or rather edged, from the mechanical point of view, with horizontal and vertical axes and geometric centers. The post holes are bored on or in relation to the horizontal mechanic axis, and the finished lens is mounted and adjusted to meet the requirements of the patient's face and, at the same time, to keep both lenses mechanically horizontal. It is assumed by the fitter that the optic and geometric centers coincide, and that the axis of the cylinder is in correct relation to the horizontal axis of the lens as prescribed. It is possible, of course, to bend a mounting to correct an error in axis of two, or even two and a half degrees, without making the glasses appear askew on the face—and this method is sometimes followed by a few oculists who try to fit their patients accurately and who have difficulty in obtaining absolutely accurate lenses; but our experience and conversation with numerous opticians has convinced us that an optician practically never

alters the mechanic adjustment to meet any supposed or real variation in the above relation between the optics and mechanics of a lens. Hence, except in the rare instances of intentional and definite decentering, any variation between the optic and geometric relations of a lens constitutes the error in the grinding of that lens. The findings herein presented are based on the comparison between the optic and geometric measurements of six hundred lenses in all.

In the appended chart it may be seen that in the general group only 91 out of 350 lenses were found accurate in every detail. Of the 310 lenses containing cylinders, in 111 the axis was more than two degrees in error; in 53, five degrees or more; in 15, ten degrees or more; in 7, fifteen degrees or more; in one each, nineteen degrees, twenty-two degrees, thirty degrees, and thirty-four degrees in error of the prescribed axis. Allowing for a commercial or personal equation error of two degrees on the axis and one mm. on the center, we still find unsatisfactory 184 out of 350 lenses. Of the 350 lenses, 117 were decentered over one mm.; 38, three mm. or more; 11, five mm. or more; 2, nine mm.; and 1, twelve mm. Though not included in this report, it is not uncommon to see plain cylinders with prism insertion because of irregularity in thickness of the circumference of the lens. Such lenses have no optic centers.

In regard to the optic causes of decentering found in lenses, we are not ready to make any definite statements. Theoretically, the decentering of a lens of given strength a definite amount is equivalent to the insertion of a prism of measurable and known strength; but the decentering sometimes met in optic work is not always produced by any degree of prismatic content, as shown by caliper measurement. Such decentering may possibly be due to a wave on the surface of the lens or to some irregularity in the internal structure of the glass, and in either case would be worse for the patient than the degree of prism represented by the amount of decentering shown. Any marked amount of decentering, therefore, shows an inaccurate lens, either because of the prism insertion, which is usually the case, or because of some flaw in the glass itself.

Permit us to note again that with a few exceptions all of the above errors in the general group were worn by patients for a longer or shorter time.

That all of these errors are removable, and therefore unnec-

essary, is shown by our control, in which a comparatively low percentage of error was rendered negligible by rigid inspection of lenses by the prescribing oculist, who insists that his optician replace all wrong lenses with correct ones. We do not hesitate to say that our control has too high an error, for one of us (Dr. Hartshorne) has found at least one optician in New York City who, with a rare slip of one or two degrees on the axis and one or two millimeters on the center, is producing perfect work. And, in justice to Dr. Durand's optician, when Dr. Durand sent his records to Dr. Hartshorne, he wrote: "The large errors in axis have been unusual. I do not think there have been two before in a year." But the average optician throughout the country will probably show a higher degree of error than our control. It is also shown that these errors are removable in the work of those men who use axis finders and centering machines in their offices. For example, Dr. Charles W. Kinney, of New York City, an unusually busy man, tells all of his patients that he takes no responsibility for their glasses until he has checked them up himself in every detail. He has carefully used such a machine for several years and says frankly that he would not wish to be without it, and also that he knows he is now getting a higher grade of work than formerly, simply because the opticians know that he has and uses an axis finder.

Dr. George H. Wright, of New Milford, Conn., also uses an axis finder and centering machine, and thus avoids giving his patients the mistakes of the optician. He says: "I am sorry that I cannot state the exact percentage of error in the work of the optician from whom I get my glasses. It is certainly quite the exception for both lenses of a pair to be correct. The actual strength is usually right, the axes are usually wrong from two to seven degrees, and a considerable proportion of lenses is decentered. Besides all this, a good many of the rimless glasses have the post holes drilled at a distance from where they belong. Whenever it is possible so to bend the frames as to bring the lenses in proper position before the patient's eyes, I do so; when this is not possible, I send the glass back and get another."

What are the reasons for these many errors? To defame as dishonest the optic houses thus involved would be unjust and false. There are no more crooks in the optic trade than in the medical profession, and perhaps not as many. Commer-

cialism rather than dishonesty is one of the chief causes. In the big wholesale houses which put out hundreds of prescriptions daily (some houses as high as one thousand eight hundred) it is humanly impossible for three or four men to check up every lens that is delivered without letting some errors escape them. Also, big show cases and the ability to sell the goods have no connection with accuracy of production. The system of checking finished lenses said to be used in a number of optic houses is excellent, and if really carried out should greatly reduce the errors mentioned.

The small, inconspicuous shop controlled by one man, and he an optic scientist who is really jealous of the accuracy of his own products and who possesses a high degree of what Henry Cabot Lodge has been pleased to call "intellectual honesty," is sometimes one of the best places to obtain the highest degree of accuracy. Like the rest of us, however, they are all human, and they all at some time make mistakes, and the frequency of these mistakes is often dependent upon the question of ability as workmen, even though exercising great personal care.

One of the greatest reasons for this inaccuracy is that the profession allows it to persist. The optician well knows that if anything goes wrong with the glasses the patient blames the oculist, and yet many oculists feel that their responsibility ends when they have written the prescription. It would seem as if most of us have to account for enough sins of our own without adding the burden of the optician's sin. Those physicians who are ready to accept their just responsibility in determining that prescriptions have been filled as ordered will thereby remove the burden of the optician's errors and protect both the patients and themselves. There will be no lasting improvement in the work received by any one oculist who does not accept this responsibility; and when enough men have accepted and acted upon it, the greater part of these errors will disappear, as it were, automatically, or at least the patients will receive a minimum percentage of error.

Many of the lenses made from these prescriptions were said to have been examined by the oculists who ordered them, and the small number of errors in amounts would show this to be true in regard to neutralizing. It seems equally evident from the findings that the same oculists either ignored the optic centers and exact cylinder axes, or else simply went through

the motions of examining them. After watching experienced men attempt to locate a cylinder axis with the neutralizing lens, we are satisfied that very few can really find it accurately in this way; certainly the majority of us cannot. Several mechanic devices have been put on the market with which one can find more or less accurately the cylinder axis and optic center of a lens. Since we have no financial interests in the making of any such machines, and simply wish to give our experience and consequent ideas in regard to their usage, we can freely discuss the pros and cons of those that we have seen. These descriptions appear in Appendix II.

The requirement of accurate production should not raise the retail price of lenses. All opticians will assure you that their work is accurate, and with one or two exceptions we have found all opticians glad to replace lenses wrongly made. No honest optician will try to get an added profit because of his own mistakes.

In passing, we refer those interested in the accuracy of trial case lenses to the article above mentioned.[1]

This report will have served its purpose if the reader is convinced that there does exist a large percentage of error in the output of many optic houses and many opticians, and that practically all of these errors are removable by the efforts of the individual oculist if he becomes his own lens inspector and checks up in detail every lens which he uses in his office or for which he writes a prescription. Those who consider glasses of value for visual purposes only, and those who are satisfied with whatever grade of success has come to them in spite of errors in grinding, will doubtless continue to permit between ten and sixty per cent of their patients to wear glasses in error of the prescription. All others will heed the call to clean house, and will aid in developing the new era of accurate optics by accepting no substitution in their own optic prescription work. We sincerely trust that all doubters will obtain an up-to-date axis finder and centering machine, and prove to their own satisfaction the truth or falsity of the case as stated.

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2. Richards: Perfect Optical Work. Annals of Ophthalmology, April, 1910.
3. Wright: Eye Strain. Yale Medical Journal, May, 1911.

Appendix I.

	General Group		Control	
	Units.	Per Cent.	Units.	Per Cent.
Total number of lenses	350		250	
Number of physicians	38		1	
Number of opticians	New York City..25 Other cities.....20		1	
Accurate lenses	91	26.03	194	77.60
Lenses accurate within 2° on axis and 1 mm. on center	166 in 350	47.48	232 in 250	92.80
Number of simple spheres	40	11.44		
Number of simple cylinders	75 } Cyls. 310	21.45	250	100.00
Number of spherocylinders	235 }	67.21.		
Number of prisms ordered	12	3.43		
In error over 2° on axis	111 in 310	35.85	8 in 250	3.20
In error 5° or more on axis	53 in 310	17.12	4 in 250	1.60
In error 10° or more on axis	15 in 310	4.85	1 in 250	0.40
In error 15° or more on axis	*7 in 310	2.26		
In error over 1 mm. on center	117 in 350	33.46	18 in 250	7.20
In error 3 mm. or more on center	**38 in 350	10.87	3 in 250	1.20
In error 5 mm. or more on center	***11 in 350	3.15	1 in 250	0.40
In error 10 mm. or more on center	1 in 350	0.29		
Focal amounts in error	15 in 350	4.29		

EXTREME ERRORS.

*Errors in Axis	**Decentered 3 mm. or more	***Decentered 5 mm. or more	Number of lenses from individual opticians (6 or more lenses).	Percentage of error, allowing 2° on axis, and 1 mm. on center
1 lens 19 degrees	Vertical ..... 4 lenses	1 lens, up 5 mm.; out 2 mm.	69	53.6
		1 lens, up 1 mm.; out 5 mm.	40	60.0
	Oblique .....21 lenses	1 lens, up 5.5 mm.;	34	58.8
1 lens 22 degrees		1 lens, down 6 mm.	28	63.3
	Horizontal { in 3 lenses	1 lens, down and out 7 mm.	20	30.0
1 lens 30 degrees	out 8 lenses	1 lens, down 5 mm.; in 2 mm.	17	47.1
	(?) 2 lenses	1 lens, down 8 mm.; in 6 mm.	10	10.0
1 lens 34 degrees		1 lens, down 2 mm.; in 7 mm.	10	60.0
		1 lens, in 5.5 mm.	8	50.0
		1 lens horizontal 9 mm.	8	87.5
		1 lens, horizontal 12 mm.	6	33.3
			6	50.0
			6 (2)	66.6

This investigation does not include bifocal wafers, since an ophthalmologist who neutralizes the distance portion of the lens will also check up the focal power of the wafer. Numerous errors have been seen in the added segment.

INTENTIONAL DECENTERING.

No prescription seen included an order for decentering, and the better opticians seldom decenter a lens unless so ordered by the prescribing physician. The larger amounts of decentering seen in ** and *** can be considered as errors because of the prism insertions which were not ordered. The remaining 67 lenses decentered over one mm. and less than three mm. may contain a few lenses intentionally decentered in order to adjust a certain size of lens to a particular pupillary distance; but as none of these lenses were of extra large size, and as we believe this intentional decentering is seldom practiced by opticians, we simply mention this in fairness, for what it may be worth in relation to the total findings. We do not attempt to establish a certain percentage of error, but simply to show that a deplorable and removable error exists.

Appendix II.

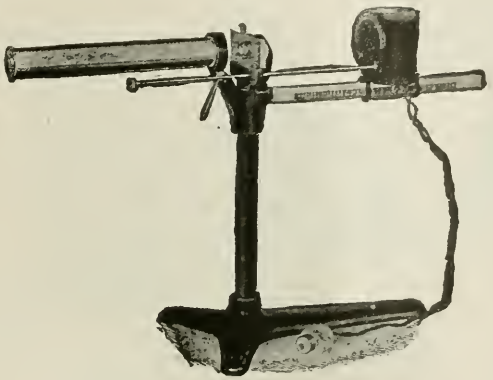
INSTRUMENTS.

The "Lloyd Axometer" is made by the Globe Optical Company, Boston, Mass., and the price quoted is $85.00 net. This apparatus is undoubtedly the nearest to perfection yet made for finding the axis of a cylinder and for determining the focus of the lens.

"It is not intended for use on uncut lenses, but as a check on finished work, where it is quick and accurate and at the same time easy to use. No cross line target is used; instead, the operator watches images on a ground glass screen. These images are three in number, and are caused to appear sharp and distinct by moving the lens backward and forward. The sharp images are conjugate to the light source and determine the focus. If a cylinder is present the images will appear as three parallel lines, when the perforated screen must be rotated until the images superimpose and the focus of that meridian will be indicated on a scale at the side. The perforated screen

must then be rotated to an angle of 90 degrees from the first position and the operation repeated. The difference between the two readings will indicate the power of the cylinder, and the axis at the shorter focus is the axis of the cylinder. The lens, whether unmounted or mounted in spectacle or eyeglass, is held in a spring clip which automatically centers it; that is the geometric center."

This instrument has one marked defect: it is not an optic centering machine, and consequently does not show the prism content, whether intended or through error, in centering; and furthermore, its price is prohibitive except for the few. If some other device is at hand for centering lenses accurately,

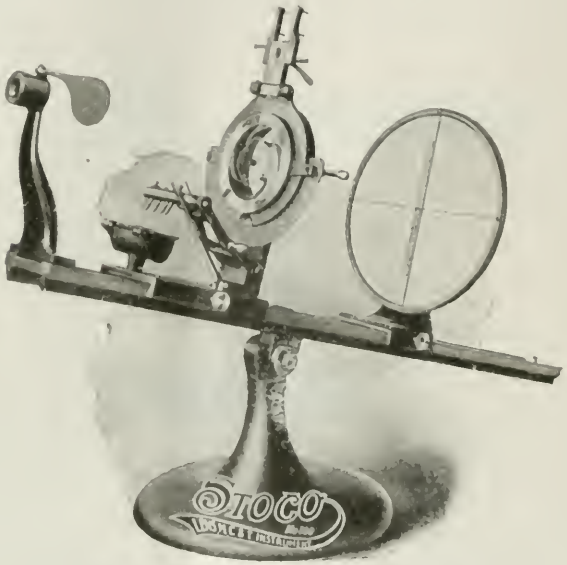


Lloyd Axometer.

for those willing to pay for it, this is the machine of choice for examining finished lenses.

An older and even better all-around device is the "Standard Axis Finder and Centering Machine," made by the Standard Optical Company, Geneva, New York, the price quoted on the latest model being $75.00 net. This instrument can be used to perform the first centering and marking necessary to lay out the lens for cutting and edging, "and also to test the finished lens, showing not only any error in location of center and direction of axis that may be present, but also the amount of the same." In experienced hands the cylinder axis and optic center can be determined very closely with this machine. The cross line target revolves so as to be placed at any degree

desired from 0 to 180, and a marking device enables the operator to show accurately both the horizontal mechanic axis and cylindric axis of a given lens. Of course, in a simple sphere the center only is to be considered. The spring device intended to hold the lens between the eye and the cross line target is easily thrown out of adjustment, thereby giving inaccurate readings. As one gets more accustomed to this machine he uses this lens holder less and less, because it is easy to learn to hold the lens firmly against the transparent dial in the free hand, and he does not have to stop to correct the adjustment



Standard Axis Finder and Centering Machine.

of the lens holder. Experience teaches that this free hand lens holding, when mastered, is even more accurate than the spring device.

The Standard machine requires more time to master than the Lloyd Axometer, and does not show the focal power of the lens as does the latter, but as an instrument of wide usefulness it is the best yet produced. It costs more, however, than most men care to expend for the purpose.

There are several other $10.00 similar contrivances made by

various firms. Some of these are comparatively useful, but accurate only in the hands of the most experienced and painstaking operator, since they require extra effort on his part to make up for the mechanic deficiencies of the instruments. Others are so crude in structure that parts of the machine itself interfere with its use. Still others are of no value in absolute accuracy, but would make good playthings.

We believe from our experience that when one of these better instruments has failed to give satisfaction, the fault is with the user and not with the machine. Dr. Hartshorne marked in the rough with a Standard instrument all of his own prescription work for nearly one year, and had practically no difficulty in getting lenses so marked accurately ground. We do not, however, wish to prescribe the methods or instruments to be used by the opticians, as we do not care how it is done provided the finished product is accurate.

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

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Pulsation of the Retinal Arteries.

BALLANTYNE, A. J. (*Ophthalmoscope*, June and August, 1913). Certain facts tend to show that the intraocular pressure plays a role in the causation of the expansile and collapsing forms of the retinal pulse as well as in the pressure pulse, and the different forms of the pulse are more closely related to one another than is generally supposed. By varying degrees of finger pressure an expansile pulse passing into a typical collapsing pulse has been produced. In a case of glaucoma also a phenomena linking together these two forms of pulse has been observed. Expansile pulse, present both on the disc and beyond it, was readily converted to typical collapsing pulse,

within the area of the disc, and increased in distinctness beyond the disc margin, by slight pressure on the eye with the finger. In cases of aortic regurgitation the same phenomena may be elicited. In one case pressure pulse was found without artificial pressure. Locomotor pulse, observed in an extremely anemic girl, was suddenly converted into collapsing pulse when a fainting fit occurred, the fall of blood pressure being so sudden that it was not at once accompanied by a fall in intraocular pressure.

These observations are sufficient to show that while in the majority of cases of the pressure pulse high intraocular pressure is the preponderating factor, and in the typical expansile pulse the form of the pulse wave is of greatest importance. still the two forms of the pulse are not entirely separate phenomena, but have this in common: that the intraocular pressure plays a part in their production, and that in both of them the intraocular pressure is equal, or nearly equal, to diastolic blood pressure in the retinal arteries.

The mechanism of the capillary pulse resembles closely the well known capillary pulse seen under the finger nail in cases of aortic regurgitation, except that on the disc it is usually a spontaneous phenomenon. It is probable that under physiologic conditions the circulation in the capillaries of the retina and disc is pulsatory as regards pressure and velocity, but without causing expansion and contraction of caliber. But if the pulse wave is modified as we have it in aortic regurgitation, the conditions are at once established for the conversion of this into an actual expansion and contraction of the capillaries, showing itself as the visible capillary pulse.

The capillary pulse and the three forms of arterial pulse are related to each other through their dependence on a common mechanism which comprises two factors, viz., the intraocular pressure, and the blood pressure within the retinal arteries. In the case of the locomotor pulse the influence of the first is at a minimum, while in the best marked examples the second is pathologic, in the sense that the range between systolic and diastolic pressure is abnormally great. In the case of the expansile pulse intraocular pressure may be abnormal, as in glaucoma and the finger pressure experiments, but to a far greater extent this pulse also depends on the oscillation of the blood pressure, e. g., as in aortic regurgitation. In

the case of a collapsing pulse intraocular pressure may be pathologic, with blood pressure normal (glaucoma and pressure experiments); or with normal intraocular pressure, endovascular pressure may be abnormal (syncope and cardiac disease with dropped beats), or both factors may be pathologic (experimental pressure in aortic cases). The most typical of these possibilities is, of course, glaucoma. The conditions associated with the capillary pulse resemble most closely those of the expansile pulse, but the capillary pulse may sometimes be produced experimentally by application of pressure in cases of aortic regurgitation or even in normal eyes.

With a view to arrive at a conclusion as to the diagnostic and prognostic significance of the arterial pulse, notes were kept on (1) 319 patients in the medical wards of a general hospital, and (2) 100 unselected refraction cases, presumably healthy subjects. Among the latter locomotor pulse alone was found in 33 per cent. the expansile pulse, along with the locomotor, in 3 per cent, the pressure pulse and capillary pulse not at all; an arterial pulse of some kind in 36 per cent.

Analysis of the medical cases in group 1 gives the following results:

(a) The locomotor pulse alone was present in 75 = 23.5 per cent.

(b) The expansile pulse alone was present in 32 = 10.03 per cent.

(c) The capillary pulse alone was present in 13 = 4.07 per cent.

(d) The pressure pulse alone was present in 1 = 0.03 per cent.

From these figures and the writer's general experience the conclusion is reached that a slight displacement pulse is seen, if carefully looked for, in more than a third of healthy individuals, that some diseases have the effect of suppressing the pulse or rendering it less distinct, while others render it abnormally distinct and in many cases even produce in addition the expansile pulse and capillary pulse.

An effort was made to determine what diseases favored the occurrence of the pathologic pulse and the circulatory conditions in virtue of which they do so.

(a) The locomotor pulse—It occurs that two pathologic conditions, viz., anemia and aortic regurgitation, are pecul-

iarly liable to be accompanied by a pronounced and probably pathologic locomotor pulse.

Anemia is of secondary importance, since the more fully developed phenomena of the expansile pulse, pressure, and capillary pulses, are to a much greater extent conditioned by the presence of the aortic regurgitation.

The condition present in a typical aortic regurgitation explains why it is the condition par excellence in which arterial pulse is found in the retina. The incompetence of the valve allows more or less of the blood expelled at systole to regurgitate into the ventricle during diastole, hypertrophy and dilatation of the left ventricle occur, and hence at each systole an abnormally large volume of blood is forcibly thrown out into the aorta, while at diastole the volume of blood in the aorta abruptly falls through failure of the valves to prevent its return. This results in the transmission into the arteries of a pulse wave which is of large amplitude, abrupt in its rise and fall and of short duration. The great variations of pressure to which the arteries are subjected by these abnormal conditions make it impossible for them to maintain their normal tonicity, they become more lax, and this not only renders more manifest the abnormal character of the pulse wave, but allows it to be propagated to a greater distance than under normal conditions, even to the capillaries.

Cases which show distinct expansile or capillary pulse in the retina, not suffering from aortic incompetence, do so only in so far as they present circulatory conditions resembling those described above.

Arterial pulse in the retina seems to be more pronounced in exophthalmic goiter than in healthy individuals.

No reliable statement can be made as to the frequency in the various forms of glaucoma. The phenomenon has been described most frequently in cases of subacute or noninflammatory types. The characteristic pulse in these cases is, of course, "pressure" pulse, but this is not by any means always present.

Summary.—1. The locomotor pulse in its slighter form may be considered physiologic or at least not pathologic. Excitement is probably responsible for its temporary appearance in some cases. The only forms of illness which appear to favor the occurrence of a locomotor pulse, apart from the pro-

nounced degrees of it associated with the expansile pulse, are anemia and perhaps certain forms of debilitating disease, such as diarrhea and malignant disease; and the latter probably act in the same way as anemia, namely, through loss of vascular tone. In its most pronounced form the locomotor pulse has the same significance as the expansile pulse.

2. The expansile pulse has also been observed in healthy persons, but not nearly so frequently as the locomotor pulse. In the great majority of cases it is associated with incompetence of the aortic valves, and apart from this it seems to occur only when the circulatory conditions characteristic of aortic incompetence are more or less in evidence.

When a well marked expansile pulse is present it is practically always accompanied by an equally well marked locomotor pulse.

3. About one-half of the cases which showed the expansile pulse had at the same time a capillary pulse on the disc, and, as the latter is rarely seen apart from aortic regurgitation, its significance is similar to that of the expansile pulse.

W. R. P.

Interstitial Keratitis (Congenital Syphilitic) Treated by Salvarsan.

Wallis, G. F. C. (*Ophthalmoscope,* June, 1913). A series of ten cases of interstitial keratitis treated with salvarsan and neosalvarsan is reported. The ages varied from thirteen to thirty years, and duration of disease from four to thirty-two weeks. Adults were given full doses and children a proportionate dose, all intravenously, ten days apart and repeated three to six times. General mercurial treatment and local treatment to the eyes were also given.

The results obtained from one or two doses were disappointing, but after the third or fourth injection the cornea began to clear, the pupils to dilate, and the ciliary injection and photophobia to subside. In some the clearance was so marked, once the process started, that difference could be noted daily. In only one case was the disease still fairly active at the end of the fifth injection. It is concluded that "606" and "914" are of greatest benefit in a considerable number of cases, very appreciably lessening the time of recovery, but may not prevent the affection involving the sound eye in monocular cases.

W. R. P.

Some Additional Notes on Sclerocorneal Trephining.

Elliot, R. H. (*Ophthalmoscope*, June, 1913). The author's experience, founded upon 900 cases of sclerocorneal trephining, operated in Madras since 1909, has convinced him that it is a safe, easy and rapid method of dealing with nearly every form of glaucoma, from the most chronic to the most acute.

Points in the operative technic emphasized are: (1) A large flap roughly concentric with the limbus, ending on either side at a distance of at least 4 mm. from the sclerocorneal junction, enabling the filtering fluids from the interior of the eye to find a free exit, not merely within the limits of the flap, but also into the whole area of intact conjunctiva. (2) The cornea must be split at the middle of the base of the conjunctival flap, and the conjunctival layer of the cornea detached from the deeper layers over a limited area, adequate to allow the trephine to be placed as far forward as possible. (3) The substitution of a sliding flap is discouraged as necessitating the insertion of sutures and not allowing the trephine hole to be placed further forward than the limbus. (4) An iridectomy should be made simply to avoid the risk of iris tissue becoming impacted in the trephine aperture during convalescence. Great stress is laid upon the splitting of the cornea, the difficulty of which is greatly overestimated. "One may, and often can, trephine successfully outside the limbus, but if one desires to operate with an assurance of success, one must place the trephine hole as far forward as possible. Only thus can one be confident of a direct entry into the anterior chamber unhampered by any adhesions which may happen to present between the iris base and the corneal periphery."

The trephined disc practically always remains hinged at one point to the scleral coat, and when the cornea is split and the trephine hole placed far forward, the free edge of the iris bulges into the opening, pushing the disc to the side, so that both disc and iris may be included in one grip of the forceps and divided together with a single snip of the scissors. The advantage of performing the iridectomy with the same cut that severs the hinge is that the grip of the disc steadies the eye, and all risk of uveal tissue being dragged into and becoming impacted in the trephine hole is avoided. Iris complications have now practically vanished in his experience. The

operation is compared with the various other modern operations for glaucoma in vogue. It is claimed that by virtue of the small aperture made it approaches more nearly to the conditions and therefore to the implied safety of a sclerotomy than does any other form of sclerectomy. Iridectomy is discredited as practically useless in chronic glaucoma and less certain than trephining in acute glaucoma, in addition to the difficulty of performance. Objections to the LaGrange operation are summarized: the original incision is unnecessarily and dangerously large, and is placed over a dangerous area; exact gradation of the piece of sclera removed is difficult; and, lastly, the channel made is mechanically incorrect.

An appendix is added of short abstracts of seven cases under observation from fifteen months to three and one-half years, in all of which the tension remained normal with tonometric determination and the vision was maintained or slightly improved. W. R. P.

A Scheme for the Exact Record of Fundus Changes in Myopia.

HARMAN, N. BISHOP (*Ophthalmoscope*, June, 1913). A more definite notation for recording the various grades of choroidal atrophy and stretching about the disc is used to describe the fundus changes in the myopia of school children.

General terms as "thin" or "very thin" choroid are used where there is little pigment, and a defective choriocapillaris, or "irregular pigmentation," where the pigment is irregularly distributed or gives an appearance of tigroid striping or tesselated choroid.

The particular states of the fundus are described in terms of degree rather than the old terms, "crescent," "annulus" or "staphyloma."

Fundus first degree (F. 1°).—A circumpapillary patch of atrophy whose breadth does not exceed half the diameter of the disc.

Fundus second degree (F. 2°).—A patch of atrophy or annulus, the total width of which does not exceed the diameter of the disc.

Fundus third degree (F. 3°).—A patch of annulus the total width of which exceeds the breadth of the disc.

The classification of 218 cases measured in this fashion is charted in comparison with the degree of mean myopia of the

two eyes as determined by the retinoscope. It shows that the grading gives a very fair indication of the gravity of the myopia. W. R. P.

Perithelioma of the Eyelids.

Lamb, R. S. (*Ophthalmoscope*, July, 1913). A very interesting case of perithelioma of the eyelids is reported in detail. It is described as a type of tumor of the larger group of lymphangio-endothelioma, characterized as exhibiting capillary channels cut in various directions and lined by recognizable endothelium. Around each capillary is a collection of cells many layers deep, arranged radially. The cells are not especially elongated, but the arrangement in rows at right angles to the capillary axis is most characteristic. The probable origin is from the lymphoid endothelium of the perivascular space, thus forming one variety of lymphangio-endothelioma.

The case reported occurred in a mulatto, 50 years of age, with a history of injury to the left eye by a flying wire nail. A tumor half the size of a pea, suspended by a small pedicle and spread out over the sclera, had been dissected off and diagnosed as malignant. The growth recurred, suggesting keloid, and was again removed. When first seen by the writer the upper and lower lids of the left eye were swollen, especially at the outer canthus, and the lids were pushed forward and away from the eyeball by the growth upon the eyeball itself.

Upon everting the lower lid, a soft grayish, gelatinous mass, a tessellated homogeneous outgrowth with a suggestion of pseudomembrane, was present, extending from the outer canthus to about the middle of the lower lid, and from the ciliary margin to the fornix, and any attempt to remove it was accompanied by bleeding from the underlying membrane. On everting the upper lid a similar growth, similarly located, but smaller in size, was found, covered by a thick, yellowish, gelatinous exudate, which hung down and bathed the outer portion of the bulb. On the eyeball, half way between the outer canthus and the outside of the limbus, was found a soft "mushy" tumor, apparently of subconjunctival origin, about 7 mm. in its horizontal diameter and 5 mm. in the vertical, overlying the external rectus and in nowise limiting motion

of the eyeball. The vision, 20/13, was often obscured by superabundant secretion of mucus. Wassermann reaction was negative, as also von Pirquet and Moro tuberculin tests. Removal was followed by recurrence and complete exenteration became necessary. The early removal and the fact that all glands communicating by lymphatic vessels were perfectly normal in size, gave a good prognosis for prolonged life.

The growth upon the eyeball was found to be a granuloma, for it had healed perfectly without disturbance of vision. The growth on the lids, after repeated examinations of the specimens removed for the purpose during the early stages, with nothing characteristic being found, finally showed unmistakably to be perithelioma. W. R. P.

On Concretions in the Optic Nerve.

Giri, D. V., (*The Ophthalmoscope,* July, 1913). The contribution deals comprehensively with the least understood of concretions in the optic nerve, viz., those in the intervaginal space. A case of concretion in the papilla is also cited. Owing to the confusion arising from the use of arbitrary names, as "colloid," "hyalin," and "amyloid," because of the variability of the staining reactions, it is suggested that the names be based on the anatomic position and histogenesis, which are constant and convey a definite intelligible idea to the mind.

A well formed concretion in the intervaginal space, as seen microscopically in a section, has a regular rounded structure. It has a center of very fine granular débris disposed in closely set, well defined, regular concentric layers. The center is marked off from the rest by its greater refractility and is encircled by a deeper-stained ring, in which the concentric lamellation is less defined, and the débris is not so finely granular as in the center. The succeeding ring stains deeper still, is composed of coarse granules and looks like a wavy fringe of tangled curly hair interspersed with faintly staining, malformed, breaking-down nuclei. The whole is enclosed in a capsule, which presents a fine fibrillary appearance, stains lightest and contains here and there a degenerating nucleus. Outside the capsule are to be seen concentrically arranged rows of nuclei, which are short or long ovals, whose long axes run parallel to the circumference of the circle which

they form. The smallest concretions often appear homogeneous. The diameter of these concretions varies from 22 micra to 110 micra, the average concretion having a diameter of 88 micra. They go by the name of "copora arenacea."

Microscopically various stages of development of the concretions can be seen. Some young concretions give evidence of their arising from a gradually developing hyalin degeneration of the connective tissue trabeculæ.

Corpora arenacea occur very seldom in the intervaginal space. They are mentioned only three times in the literature. They are never found in young patients, and have no pathologic significance in this space other than that of a kind of senile change. Corpora arenacea in the intervaginal space do not fuse, but tend to remain distinct.

Notwithstanding the fact that the corpora amylacea develop only within the nerve substance, and hence are never found in the intervaginal space, they have been confused with the corpora arenacea of this space, owing to the fact that a concentric structure, as in the genuine corpora amylacea of plants, may be present in both, and that they may both react similarly to stains.

Drüsen in the optic nerve head have erroneously been put under the same group as corpora arenacea.

A case of drüsen in a man, 42 years of age, with iridocyclitis following a perforating injury incidental to a dynamite explosion, is described. The eye was enucleated and a study made of a series of sections. A large number of concretions of varying size were found lying deep below the surface of the papilla in front of the lamina cribrosa. They are all made up of a fine granular débris, disposed in delicate concentric layers. The granules are somewhat coarser towards the periphery of the concretions. The large concretions have a well-defined, irregularly nodular outline, and the body is composed of a series of concentric systems.

The larger ones are conglomerates of smaller ones, the better the fusion the less marked off are the concentric systems from one another. In the neighborhood of and between the smaller conglomerates, the neuroglia cells appear closely packed in a number of layers—an appearance probably due to neuroglia strands getting pushed together by the growing concretions.

Various theories have been put forward as to the origin of

drüsen, but their hyalin nature is generally accepted. The writer agrees with Streiff, that an alteration in the constitution or a disturbance in the circulation of the lymph in the eye lies at the root of drusen formation. This change may come on as one of short or long duration, may be general or local, leading to small deposits, which afterwards grow by the same chemical process which caused the initial deposition of insoluble albuminoid substances from the lymph. That the deposition takes place in the neighborhood of the central vessels or at the edge of the disc, as a rule, is probably because the edge of the disc and the surface of the vessel walls act as points of resistance to the lymph stream and as scaffolding for drüsen formation. W. R. P.

Some Complications Recently Met With in Glaucoma Operations.

Herbert, H., (*The Ophthalmoscope*, July, 1913), reports three cases of failure in sclerotomy operation for glaucoma.

In the first case of a triple flap operation, leakage through the wound was prevented by contact of the iris base, necessitating a second operation. No iridectomy had been done.

In the second case the conjunctival flap was either short or somewhat folded, failing to cover completely the ciliary body exposed beyond the elevated scleral flaps. Infection resulted with lowered vision, cataract formation and vitreous opacity.

The third case of a small flap sclerotomy was performed for chronic noncongestive glaucoma. Here a subconjunctival prolapse of iris on the second day resulted from a cough and failure to keep the pupil contracted. Cataract resulted.

In the last case reported, a triple flap incision for noncongestive primary glaucoma was made without reflecting a conjunctival flap. The wound leaked very freely, the chamber became very shallow and the lens cataractous.

The writer believes the triple flap incision to be more effective than the original flap sclerotomy, and applicable to cases for which the later operation is unsuited. W. R. P.

Two Unusual Orbital Conditions.

Posey, Wm. Campbell (*The Ophthalmoscope*, August, 1913). Two interesting cases of orbital growth are described. The first case is a chronic inflammatory tumor with cyst and

giant cell formation in the floor of the orbit and connecting with the lacrimal sac, arising after false passages made with lacrimal probes.

Externally it presented a swelling the size and form of a small butternut in the lower and inner part of the orbit, which gave the impression of a bunch of small angle worms to the examining finger. Firm pressure elicited crepitation and caused the swelling to disappear. The mass appeared to have no connection with the adjacent bone below or with the lacrimoethmoidal cells internally. The eyeball was normal, nor was there any evidence of any involvement of its external muscles. X-ray and rhinologic examination were negative. Excision of the growth was accomplished without difficulty.

Pathologic examination of the tumor mass showed numerous small empty semitranslucent cysts scattered irregularly through the soft substance. No capsule. Histologic examination showed a fibrotic stroma with occasional small collections of lymphocytes, and scattered through it numerous small cysts varying in size and without contents. The cysts were lined with epithelioid cells, which apparently occluded some of the smaller cysts. Numerous foreign body giant cells were present, more commonly in the smaller cysts, though occasionally very large giant cells, flattened out apparently by some form of pressure in the cyst cavity, could be observed in the walls of the large cysts. The walls of the blood vessels were not altered, and there was no proliferation of their endothelium. The tissue was very vascular but not of angiomatous character.

The conclusion was reached that it was not a true tumor, but the reaction of the tissue to some foreign body irritation. Air doubtless entered the tissues in the region of the sac, through a small fissure or fissures in the inner orbital wall, in consequence of the false passages made by the probes, and the neoplastic mass or air tumor, as it might be designated, arose, in all probability, by the reaction in the tissues neighboring upon the sac to some form of foreign body irritation.

The second case was a large lacrimal mucocele occasioned by pressure exerted externally by the distended walls of the anterior ethmoidal cells, in consequence of the retention of mucus within that cavity.

A large mucocele of the left lacrimal sac was extirpated in

a colored patient. One year later a second swelling appeared in the region where the sac had been removed. Mucocele of the ethmoidal cells was diagnosed and drainage established through the nose after evacuation of the contents externally. Healing was rapid and uninterrupted.

The writer is of the opinion that the sequence of the double mucoceles in this case may be explained as follows: The patient, already predisposed by the anatomic formation of his skull to retention of the mucous secretion from the ethmoid cells, presumably by too small avenues of exit, had doubtless had these completely closed from some catarrhal condition of his nose. In consequence of this obstruction to the orifice, the mucus within the cells had slowly distended its lateral wall, thereby exciting gradual and continued pressure upon the lacrimal sac, displacing this structure from its position in the lacrimal groove and hindering the escape of its contents into the nose by a compression of the lacrimonasal duct, and perhaps closing the canaliculi by a similar process. The lacrimal mucocele was extremely large, and none of its contents could be expressed either through the canaliculi or into the nose. W. R. P.

Acute Purulent Keratitis in Exophthalmic Goiter, Treated by Repeated Tarsorrhaphy, Resection of Cervical Sympathetic, and X-Rays—Retention of Vision in One Eye.

Juler, F. A. (*The Ophthalmoscope*, August, 1913), reports a case of exophthalmic goiter, in which both eyes were successively affected with an acute purulent keratitis. When first seen the right eye showed extreme exophthalmos, with hypopyon and suppurative keratitis. The proptosis and inflammation increased, with intense congestion and chemosis; cornea hazy, with purulent ulceration of the lower half and hypopyon. Temporary improvement was obtained by orbital incisions and paracentesis of the anterior chamber, but the process extended rapidly again, and excision of the eye became necessary.

The left eye, which up to this time had showed marked exophthalmos but no signs of inflammation, now gradually developed an acute purulent keratitis similar to the right eye. The globe became immobile, the lids could meet only with an effort, and the corneal patch assumed a yellowish appear-

ance. Under general anesthesia the external canthus was divided, the orbital tension relieved by deep incisions, and tarsorrhaphy performed after splitting the lids. It was found that the yellow appearance was due to adherent mucopus, and washed off in irrigation. After four days the lid stitches gave way and the proptosis and corneal condition soon became as threatening as before.

The lower half of the superior ganglion of the left cervical sympathetic, together with an inch of the adjacent nerve, was removed, the orbit incised, and the conjunctiva detached from the limbus and brought together over the cornea, and the tarsorraphy repeated.

After ten days the stitches came away or were removed and the few strands of union broke down. Although the tension behind the globe was not so great, and the cornea had improved, yet the condition of the latter still looked threatening. The lids were then kept in apposition for a time by a few mattress sutures, but the corneal suppuration recurred, orbital incision, canthotomy and conjunctivoplasty were repeated, and tarsorrhaphy was performed, with more extensive flap formation. The lids remained closed for some ten days, but only one narrow band of union persisted. The cornea, however, healed, and no further ulceration had taken place, whilst the conjunctiva gradually became less congested.

X-ray treatment of the thyroid gland was carried out at the same time. A good recovery was made with remaining exopthalmos but the lids able to cover the globe. Vision, 5/12.

The literature is reviewed. The following conclusions are given with regard to treatment of this complication of exophthalmic goiter. Consideration of the present case suggests that orbital incision and free tarsorrhaphy should be the first step, and may be repeated if necessary. It is important to relieve the pressure of the globe against the lids, and after splitting the latter, skin flap can be obtained from the region of the outer canthus and brought together, so as to diminish tension.

The question of partial thyroidectomy or sympathectomy must remain doubtful, and in each case the general condition of the patient is of importance. Contraindications given by Berry include enlarged thymus, dilated heart, or other evi-

dence of visceral degeneration. X-ray treatment may prove of value, especially if operation is contraindicated.

Some of the cases with severe general symptoms may appear hopeless, but it is to be remembered that, as Sattler has pointed out, such cases have sometimes improved remarkably when the acute manifestations have subsided. W. R. P.

On Pseudoneuritis.

Wood, C. G. Russ (*Ophthalmoscope,* September, 1913). It is remarkable that in spite of the very large mass of ophthalmic literature which has accumulated during the last fifty years, the subject of pseudoneuritis has received so little attention. The author reviews the literature with brief synopses of cases reported since 1870, when de Wecker first drew attention to the condition.

Clinically, two broad divisions can be made, namely, those discs which show signs of swelling and those which do not; and of these, the former class may be grouped under the general heading of "pseudopapilledema," and the latter under that of "pseudoneuritis." Concomitant signs of true neuritis, such as hemorrhages or macular exudates, are never observed. In a large proportion the vision is normal, and if it falls below this standard there is frequently an obvious cause to account for the amblyopia, such as a convergent strabismus, or the history of defective vision of long standing. Many of the patients complain of headache, which rather complicates the diagnosis, but in such cases the correction of refractive errors is usually followed by relief. The retinal vessels, although very frequently twisted or contorted, are never engorged, and no marked difference between the size of the veins and arteries can be made out to the extent seen in true neuritis. Then, again, constitutional symptoms are absent.

Pseudoneuritis is by far the most common condition, and it presents varying appearances. The most common form is the striate variety, with slight blurring of the disc edges; this is frequently seen in hypermetropic patients, and the appearance is probably caused by the retina in the small hypermetropic eye not being fully stretched out, thus causing minute radiating folds around the disc. When it is remembered that this condition is found chiefly in less developed hypermetropic eyes, probably in most negroes and certain mam-

mals, it suggests that this may be a reversion to another type of fundus. The other examples of pseudoneuritis present a grayish-red appearance of the disc, marked woolliness of its edge, tortuosity of the vessels, and some connective tissue adjacent to them at their origin. This type is not confined to hypermetropia, but is found in association with other refractive errors, or in emmetropia. Together with the striate variety, this is found at all ages, and is undoubtedly congenital. With few exceptions the vision of these patients is good. The ophthalmoscopic appearances suggest that a portion of the embryonic "scaffold" tissue has escaped obliteration during development, a view further supported by the aforementioned connective tissue remains on the disc following the course of some of the larger vessels.

"Pseudopapilledema" is much the more uncommon variety; it corresponds to the pseudoneuritis hyperplastica and prominens of Salzer. Elevation of the disc of the nasal side is frequently seen, and calls for no comment here, since it rarely gives rise to difficulty in diagnosis. When the whole papilla is enlarged and elevated, errors in diagnosis are possible, especially if combined with striation radiating from the disc, and if the margin is undifferentiated and encroaches on the retinal area. In these fundi the vessels are always contorted, and sometimes the veins appear to be distinctly swollen.

A case of pseudopapilledema under the writer's observation for eleven years is reported. There was a + 3 D. of swelling of the upper halves of both discs, the vessels were undilated, the enlargement slightly extending on to the retina; the level of the lower part of the disc was the same as the surrounding retina, which did not show any hemorrhages or white exudates. The right field for white was contracted about 20° on the temporal and 10° on the nasal side; the left field was concentrically contracted about 30°, but much more so in the inferior nasal quadrant. For colors the contraction in the right field was in like proportion to that for white; in the left it is much greater. The condition is unaltered at the present time.

The importance of pseudoneuritis is emphasized when the possibility of true neuritis being mistaken for it is considered.

In conclusion, reviewing the causation of pseudoneuritis, it is stated that the variety which shows no appreciable swell-

ing is not uncommon, especially in children, and is almost certainly congenital; whereas pseudo- or persistent papill-edema, with swelling of the optic disc is, on the evidence available at present, not congenital, and most probably represents a persistent condition of edema of the optic papilla, which for some reason does not interfere with the functions of the optic nerve. W. R. P.

Trephining in Glaucoma, Acute and Chronic—Miscellanea.

Elliott, R. H. (*Ophthalmoscope*, September, 1913), is convinced that trephining is not simply suitable, but is the operation of choice for cases of acute, as well as of chronic glaucoma. He discusses—

1. Homatropin as an adjuvant in the diagnosis of glaucoma.

2. The influence of various subconjunctival injections on the intraocular tension in glaucoma.

3. The causes of the variations in the difficulty met with in "splitting" the cornea during the trephine operation.

4. The best size of trephine to employ.

5. The best shape to give the sclerostomy wound.

6. The nature, significance, and importance of the so-called postoperative iritis, met with after trephining.

7. Some causes of failure after trephining.

He calls attention to the fact that acute primary attacks of glaucoma, despite their apparent suddenness, may be merely an exacerbation of an extremely mild glaucomatous state. The use of the trephine is not advocated in the great majority of cases, secondary to cataract, simply because this condition is most frequently met with in intumescent cataracts in which the cortical substance is fluid or semifluid, and hence tends to flow towards, and thus block up the trephine hole. Admitting the brilliant results of iridectomy, he believes that trephining is easier, safer, and a more securely permanent remedy for acute glaucoma. He believes that iridectomy when successful is so, in most cases, by producing a filtering cicatrix. Doubtless, however, cases do occur in which the results appear to be permanent, although no evidences of filtration exists. One advantage of the trephine is that it in no way interferes with the subsequent procedure of any other form of procedure which may be deemed advisable in the event of the return of

the tension, which cannot be said of an iridectomy performed in the usual way.

This, however, is easily avoided by dissecting the conjunctival flap right up to the limbus before introducing the keratome in the course of the iridectomy operation.

1. Homatropin is now used as an adjuvant in the diagnosis of the doubtful cases of glaucoma. While it is true that homatropin has been found to produce an attack of glaucoma in predisposed eyes, this occurrence is usually after several hours of continuous mydriasis. It has always been found possible in these cases to control the rise of tension by the use of eserin. Homatropin has aided in doubtful diagnosis, and has proved a perfectly safe procedure so long as a myotic was instilled as soon as the examination for which the mydriatic was used was completed.

2. The influence of various subconjunctival injections on intraocular tensions in glaucoma was tried with very disappointing results.

3. Splitting of the cornea proved difficult in 31.7 per cent of cases, in which there was an abundant subconjunctival tissue present; in 15.2 per cent of the moderate cases, and 11.6 per cent of the scanty ones, whilst it was noted as easy in 29.2 per cent of the abundant cases; 41.4 per cent of the moderate, and 58.2 per cent of the scanty ones. The conclusion is reached that the less the connective tissue present, beneath the conjunctiva, the easier it is to "split" the cornea, and vice versa. In two hundred and one consecutive trephinings, the flap was damaged on four occasions only, and not in one of these was there any evidence that the tiny buttonhole had any influence on the satisfactory course of the case.

4. The best sized trephine to use is still a question. Cases followed in Madras for long periods, from two to three and one-half years, have shown a full and free infiltration to be established and maintained by the aid of a trephine of 1 mm. or 1½ mm. in diameter. The anterior position of the trephine hole enables the operator to avoid the undesirable neighborhood of the ciliary body and the adherent iris base, so that only the free iris tissue is reckoned with.

The writer's experience has shown that an aperture of from 1 to 1½ mm. in diameter suffices to maintain permanent filtration.

Intraocular hemorrhage is met with from time to time, despite every precaution: the danger, however, is no greater than in the eye which has been widely opened by the incision necessary for an iridectomy or a Lagrange operation. The small wound loses none of the bead of vitreous present, and the patient can usually be sent back to bed with the vitreous still intact and the hemorrhage locked up under pressure. The breadth of the zone available for the implantation of the trephine, i. e., the zone between the iridocorneal angle on the one hand and the limbus, has been estimated at rarely as much as 2 mm., and usually only 1.7 mm. Adding 1 to 2 mm. to the available breadth of the area by splitting the cornea, under favorable circumstances as much as 3.2 mm. is excessible, and a 2 mm. trephine can be used with a good margin for safety. However, the smaller the trephine diameter the further is the wound removed from the area of danger, and all the indications appear to point to a 1.5 mm. flap as likely as prove the most favorable selection. (To be concluded.) W. R. P.

A Microscopic Study of the Conjunctival Vessels.

Luedde, W. H., (*The American Journal of Ophthalmology*, May, 1913), with the aid of a Zeiss binocular corneal microscope, has examined carefully the conjunctival vessels. The most important observation concerns the vascular changes in arteriosclerosis.

In the later stages of arteriosclerosis the retinal appearances are quite positive, but even then do not permit an independent and conclusive prognosis concerning the general health of the individual.

On the other hand, the changes in the conjunctival vessels are demonstrable as soon as their lumen is encroached upon, making it possible to discover the first symptoms of vascular disease. Furthermore, the signs are so clear and definite that they can be recognized unhesitatingly by any careful observer.

Evidence obtained from any ocular symptom of arteriosclerosis is only of relative and corroborative importance. Nevertheless, no clinician can afford to overlook what might be learned by a careful study of ocular conditions, including microscopic investigation of the conjunctival vessels, in any case of vascular disease.

Especially is this true in those cases where the onset is stealthy and obscure, and where an analysis of the general findings and symptoms seems to lead to nowhere. Not infrequently such cases will be found to be the victims of early angiosclerosis and will clear up after treatment of this condition and its underlying causes. E. C. E.

Mandible Capsule Forceps.

Ewing, A. E., (*The American Journal of Ophthalmology*, May, 1913). The blades of these capsule forceps meet at an obtuse angle and have cutting edges, either plain or fluted, like a Christy bread knife. It is designed to cut out cleanly a portion of the capsule without traction on the ciliary body. E. C. E.

A Case of Ocular Tuberculosis With Notable Astigmatic Variations.

Shahan, W. E. (*American Journal of Ophthalmology*, June, 1913), reports a case of ocular tuberculosis manifested by iritis and deep keratitis, in which measurement of the refraction over a period of eighteen months showed very considerable variation in the astigmatism. This is, of course, usual in such cases, but the unusual feature of the report is the large number of careful tests of the refraction that were made. There was a sharp cutaneous reaction to the von Pirquet test, and slight local reaction to tuberculin. E. C. E.

Optic Neuritis Dependent Upon Inflammation in the Ethmoid Cells.

Post, M. H. (*American Journal of Ophthalmology*, June, 1913), contributes a case report to this interesting subject. The patient was a boy, aged sixteen years, with failing vision and frontal headache of five weeks' duration. There was some nausea and slight fever, and tenderness at the upper and inner angles of each orbit. Operation on the ethmoid cells (posterior) was done by a rhinologist, and the pain and swelling subsided and the vision improved very rapidly. In twenty-four hours the vision had risen from 1/192 and 3/120 to 3/75 and 3/12, and the swelling of the discs had subsided from 4 D. and 6 D. to 1 D. and 3 D. In three weeks the

vision was 20/12 and 20/19, and the discs best seen with + 1 D. The form fields were normal one week after the operation, but there is no mention of their condition beforehand. Neither is there a report from the rhinologist, and the statement that he found "evidences of ethmoiditis" and operated, leaves us in doubt as to what the evidences were, what operative work was done, if on one or both sides, the operative findings and the operative result. This is to be regretted, since, after all, ocular disease from nasal disease is not so common, though ocular symptoms from nasal disease are very common. E. C. E.

Three Tumors Arising in Sweat Glands.

Coats, George (*Royal London Ophthalmic Hospital Reports,* Volume 18, Part 3). "The derivation of a new growth from sweat glands may be assumed," according to the writer, "if one or more of the following postulates are fulfilled: (1) If a connection with normal gland tissue can be proved; (2) if the normal gland structure is reproduced or imitated; (3) if characteristic secretion products can be demonstrated. Of these the second is of chief importance." The writer then proceeds to describe three cases of tumors arising from sweat glands: (1) Cystoma of the sweat glands of the skin of the lid; (2) adenoma of the caruncle; (3) adenocarcinoma of the eyelid. W. E. B.

Papilloma and Sebaceous Adenoma of the Caruncle.

Coats, George, (*Royal London Ophthalmic Hospital Reports,* Volume 18, Part 3). The writer supplements the preceding paper by reporting this equally rare tumor with complete microscopic examination. W. E. B.

Local Metastasis in Intraocular Sarcoma.

Coats, George, (*Royal London Ophthalmic Hospital Reports,* Volume 18, Part 3). Local metastasis, as is well known, is common—almost universal—in glioma of the retina; in sarcoma of the uvea, and especially of the choroid, it is rare. The following cases are reported not only because they showed this phenomenon, but also because some of their

other histologic features were of an unusual type. The writer reports three cases in full and concludes as follows:

"Local dissemination in intraocular sarcoma is most common in tumors of the anterior part of the uvea, and especially in those of the ciliary body. Dissemination in the subretinal space and vitreous is much rarer. The structure and physiology of the parts accounts for these relative degrees of frequency.

"No constant relation can be traced between any particular histologic or structural type of tumor and local dissemination. In the metastases themselves most of the ordinary kinds of sarcoma cell have been found.

"Both in the anterior and in the posterior part of the eye, local dissemination has been associated in a considerable number of cases with the flat type of sarcoma.

"It is probable that the tumor cells usually reach the anterior chamber by direct invasion of the root of the iris, but that dissemination by way of the posterior chamber and pupil may also occur.

"Although the lymph stream may be the chief influence in determining the direction of metastasis, it is probable that in some cases the tumor cells possess active powers of locomotion. Hemorrhage, by lacerating the tumor and setting free tumor cells in the surrounding spaces, seems to be also an occasional cause of local metastasis." W. E. B.

Report of a Case of Retinitis Pigmentosa, With Pathologic Investigation.

Greeves, R. A., (*Royal London Ophthalmic Hospital Reports*, Volume 18, Part 3). The patient had retinitis pigmentosa. On account of severe pain in one eye with no light perception and increased tension, due to ring synechia and occluded pupil, the eye was removed and subjected to microscopic examination. The changes described correspond in the main with those found by other observers. About twenty cases are on record in which one or both eyes were obtained for pathologic examination.

The order in which the changes occurred, shown both by comparing the more and less diseased parts of the same eye and by comparing more and less advanced cases, is as follows:

"It is always found that the rod and cone layer of the retina is the first to disappear, and the external nuclear layer, the pigment epithelium and the inner layers are affected in turn. The retinal vessels, arteries and veins alike appear to undergo atrophy along with the layers in which they are situated."

"With regard to the choroidal vascular system, the condition of choroidal arteries has differed in different cases. General thickening of the walls, hyalin changes in the outer coats and thickening of the retina have been severally described, but in at least half the cases the arteries had a normal appearance." Gonin showed by a series of sections that a diminution in caliber and in number of the choroidal capillaries corresponds with the earliest appreciable changes in the rods and cones. And the fact that in the macular region of the present case, where the rod and cone layer alone had disappeared, the choroidal capillaries were not normal, is further evidence that they are among the earliest structures to be affected. On pathologic evidence the first parts of the eye to undergo pathologic change in retinitis pigmentosa are the choroidal capillaries and the rods and cones. According to the Gonin-Nettleship theory, the primary change is in the choroidal vascular system, atrophy of the choroidal capillaries causing primarily atrophy of the layers of the retina depending on them for nourishment, and secondarily of the other layers of the retina. Stock has thrown doubt on this theory. He thinks the primary change is in the rods and cones and that other changes are secondary to their destruction. While it seems improbable, according to the writer, that mere death of the rods and cones should give rise to such extensive changes in the retina and choroid, the following considerations seem to point to the choroidal vascular system being primarily at fault: Atrophy of the choriocapillaris occurs at least as early in the disease as the earliest appreciable retinal changes. Again, it is well known that retinal changes indistinguishable from those occurring in retinitis pigmentosa may owe their origin to primary choroidal disease. Moreover, Wagenmann's classical experiments have shown that the outer layers of the retina are dependent on the choroidal vessels for nourishment, and that atrophy and pigmentation of the retina follow experimental cutting off of the choroidal blood supply. W. E. B.

Primary Tumors of the Optic Nerve.

Hudson, A. C. (*Royal London Ophthalmic Hospital Reports,* Volume 18, Part 3). The main purpose of this paper is a subdivision of the available cases of primary tumors of the optic nerve, based on a critical examination of their records and more especially histologic features; and the writer believes that on this basis a clearer conception may be established as to the significance, from both a clinical and pathologic standpoint, of the various types of tumor. Such an examination shows a great preponderance of a type of tumor first described by Leber and Willemer. It seems most satisfactory to look upon an outgrowth of glial tissue as the essential feature in the production of these tumors. Before such overgrowth can occur it may be supposed that the tissues must be exposed to some deleterious influence. The new growth exhibits a strong disposition to slow advance in a central (or cerebral) direction, which is characterized by the substitution of the implicated tissues by the tissues of the new growth. In this manner extensive tracts of tissues may be involved and occasionally tumors of very large dimensions may result. In this respect the new growth presents a striking resemblance to glioma of the central nervous system; in marked contrast to the behavior of the true neoplasm is the fact that in no single instance has a recurrence of new growth in the orbit after removal of one of these tumors been recorded. A most suitable designation, in his opinion, for that would-be degenerative gliomatosis, implying a generalized overgrowth of neuroglial tissue, of infiltrative character, dependent on some degenerative change in the tissues of unknown etiology. His analysis shows 113 cases of this type.

(Group A.) 70 females and 43 males. The early onset of tumor development, as evidenced by exophthalmos, is remarkable, as this symptom was noted within the first decade of life in more than 75 per cent of the cases. A primary defect of vision with subsequent obvious tumor formation, evidenced by exophthalmos, is by far the commonest sequence. As predisposing cause injury would seem to be of considerable moment. Exophthalmos was, in the majority of cases, of very slow rate of development, and unattended by inflammatory phenomena or pain. The direction of protrusion has most usually coincided with the axis of the orbit, but some

degree of deviation from this direction, usually in a downward and outward direction, has frequently been present, especially in the case of large tumors. Movement, although unrestricted in twenty-two cases, and, as a rule, but slightly limited, was completely abolished in eleven cases. Vision was in the majority of cases almost or completely abolished. The changes at the optic disc were in the great majority of cases indicative of papilledema or postneuritic atrophy, with more or less evidence of vascular obstruction. In many cases the degree of visual defect has been out of all proportion to the ophthalmoscopic signs. Hypermetropia was noted in sixteen cases. A remarkable point is the incomplete removal of the tumor in nearly 50 per cent of the cases. In fifteen cases intracranial growth affecting one or both optic nerves, with or without the chiasma, was found on postmortem examination. In spite of the frequency of incomplete removal, in no single case has a local recurrence in the orbit been recorded, while freedom from recurrence has been noted for periods, after removal, from twenty-four years to one and two years. Treatment has in all cases been directed to removal of the tumor by operation, either with or without the globe. The balance of evidence with regard to a favorable cosmetic result appears to be distinctly in favor of the simpler method of operation. It would seem wisest, therefore, to reserve the Kronlein method for those cases in which a moderate degree of vision exists and may possibly be retained. To gain access to the intermuscular funnel without resection of bone, perhaps the most efficient mode is that advocated by LaGrange. It seems fair to assume that the intracranial condition is, in the majority of cases, either stationary or so slowly progressive that the patient eventually succumbs to some commoner ailment. It would seem, therefore, that the prognosis in these cases, although it must always be guarded, may, in the absence of evidence of active intracranial extension of the disease, be on the whole not unfavorable, especially if operation has been apparently successful in completely removing the diseased tissue.

(Group B.) Fibromatosis of the Nerve Sheath. Under this heading have been grouped six cases, in which the most characteristic feature of the tumor has been an enormous development of fibrous tissue, involving only the outer sheath

of the nerve. The changes in the nerve itself have been those attributable to atrophy from pressure. It is assumed that here the irritative influence responsible for the hypertrophy has been limited to the outer structures of the nerve sheath. The early date of onset and usually slow rate of increase are notable clinical features. The fundus changes suggest that the usual sequence is from more or less obstruction of retinal circulation to optic atrophy. The absence of recurrent growth, in spite of incomplete removal, in several cases, is suggestive of the innocent character of the tumor. The indications as to operation are the same as in group A, while in the few data available there is nothing to contraindicate a favorable prognosis as to life.

(Group C.) Endothelial Tumor of the Nerve Sheath. This well defined class of optic nerve tumors presents a close histologic resemblance to the endothelial tumors of the brain membranes, being composed of masses of typical endothelial cells, supported in a usually scanty connective tissue. The cells exhibit a strong tendency to whorled formation, in the center of which laminated concretions are frequently met with. The neck-like pedicle of unthickened nerve intervening between the tumor and the globe, which is so often met with in cases of gliomatosis, is not found in the case of these tumors, which tend rather in the course of growth to form a cup-shaped depression in which the posterior pole of the eyeball rests, more or less firmly united to the tumor by connective tissue. He reports twenty-nine of these cases in the literature, twenty in females and only seven in males. The onset of symptoms was on the average considerably later than in the preceding groups. In more than 50 per cent of the cases onset dated from after the thirtieth year. In reference to the relationship in point of time between defective vision and tumor formation, evidence favors a failure of vision in these cases secondary to tumor formation. As regards predisposing causes, the relationship of inflammatory conditions to endothelial hypertrophy in the nerve sheath is evident in some of the cases. The rate of growth has usually been slow. The direction of protrusion is most frequently in an outward or downward direction. Limitation of movement on the whole has probably been more evident than in cases of gliomatosis. Palpation afforded but little useful information.

The venous obstruction in lids and conjunctiva, due to pressure of the growth, seems to be of a more pronounced character than in cases of gliomatosis. Vision at the time of operation has usually been completely or almost completely abolished. The fundus changes have mostly been indicative of pressure on the nerve trunk leading to vascular obstruction with atrophy of nerve fibers. In more than 50 per cent of the cases at least there was evidence of incomplete removal of the growth. In seven cases postmortem examination revealed the presence of intracranial disease. In marked contrast to gliomatosis, these tumors show a pronounced tendency to invade neighboring tissues, but in spite of this, local recurrence after operation has been recorded in only three cases. In as much as it frequently is impossible to make a certain diagnosis on clinical grounds between one of these tumors and one belonging to the preceding classes, the wisest course in these cases where the conditions appear favorable to the preservation of the globe, will be to begin the operation in the manner advocated by LaGrange, the decision as to subsequent removal of the globe being determined by the conditions found during the progress of the operation. The data on which a prognosis can be founded are too scanty to admit of dogmatic statement.

In Appendix D and E are grouped cases which cannot be classified so positively. W. E. B.

Case of Congenital Nystagmus With Microscopic Examination of Eyeballs.

Usher, C. H. (*Royal London Ophthalmic Hospital Reports*, Volume 18, Part 3). The patient was a child two years of age, who died of pneumonia two months after examination. The eyes were removed and subjected to microscopic examination. On inquiry into the pedigree, no other instance of nystagmus was found. There was no consanguinity. Information showed that individuals with blue eyes and fair hair or both formed a large majority on the maternal side and less than one-third on the paternal side. There are no albinos. A number of individuals are mentally affected. Microscopic examination of the eyes showed no proper fovea in either eye. The association of nystagmus seen during life with abnormal appearance of each macula suggests to the

writer the view that the retina is imperfectly differentiated at the fovea, which would thus explain the microscopic appearances. Whatever opinion may be held concerning the appearance of the retina proper at the macula, he believes there can be little doubt that in this case the hexagonal cells in all parts of the retina are fully pigmented. W. E. B.

An Analytic Consideration of the Symptoms of Eyestrain, With Special Reference to Those Symptoms Cited to the General Practitioner.

Newcomb, John Ray, Indianapolis (*The Ophthalmic Record*, May, 1913), has analyzed the records of 500 patients, and tries to find some connection between the type of refractive error and the symptoms complained of by the patient. He presents his results in the form of carefully worked out tables and diagrams. G. S. D.

The Intracapsular Operation for Cataract After the Method of Prof. Stanculeanu, Bucharest.

Simpson, W. Likely, Memphis (*The Ophthalmic Record*, May, 1913), describes the operation as follows: Incision in the cornea, somewhat larger than usual. Puncture made well back of the limbus. Incision is finished at the anterior edge of the limbus, and a small conjunctival flap, iridectomy, or irotomy, after Monalesco, is now performed.

The anterior capsule is grasped by means of a special capsule forceps which has no teeth (and are apparently made on the same general principle as the well-known capsule forceps of Kalt—Reviewer), and movements are made from side to side and up and down, thereby rupturing the zonula fibers; about one to three firm, steady movements are necessary. The capsule forceps are now removed from the eye. Continuous pressure with a spoon over the cornea, together with counterpressure, is made, and the lens is delivered.

The writer says that the capsule is not torn by this method, as would be expected; and even if it should be, the operation could proceed in the ordinary manner.

According to Prof. Stanculeanu, the older the patient the easier it to extract the lens by this method.

The writer saw a number of cases operated on in this way, in sixteen of which the lens was removed in capsule. He per-

formed ten operations himself, and succeeded in removing seven in capsule. He lauds the procedure, stating its advantages. The forceps may be obtained of V. Mueller & Co., Chicago. G. S. D.

Eye Unconsciously Injured.

Mitchell, S., Cornell (*The Ophthalmic Record*, May, 1913). This was the case of a machinist, who for four months had noticed a growing dimness in the left eye. Examination showed wound in the iris and small, dark object imbedded in the lens.

Although the patient many times had had foreign bodies fly into his eye during the course of his work, he was not conscious of this injury when it occurred. G. S. D.

Five Generations of Blue Sclerotics and Associated Osteoporosis.

Conlon, F. A., Lawrence (*Boston Medical and Surgical Journal*, July 3, 1913). Patient, a man aged 48 years, has marked blue sclerotics. Has had a broken wrist and three broken ribs. The patient's mother had blue sclerotics, as did her sister and her two children. Of the patient's five children, all show blue sclerotics, and three show evidence of bone fragility. One grandchild had a similar ocular anomaly at birth, but died of congenital heart disease at the end of a week.

In this family the blue varies from a light azure to a very deep blue, and is present in the entire visible sclera. There was no accentuation in the ciliary zone. The writer agrees that the anomaly is due to pigment showing through a thin sclera. Each of Conlon's cases showed an embryon toxon. The blue sclerotic seemed to be a dominant character in the family reported, as 84 per cent of the children born to a parent with blue sclerotics showed the same anomaly.

Conlon believes that blue sclerotics are always associated with osteoporosis. X-ray pictures of the bones showed a much enlarged medullary canal and a thin cortex.

G. S. D.

A Case of Pulsating Exophthalmos.

Mathewson, George H., Montreal (*The Ophthalmic Record*, June, 1913), reports a typical case in which the common carotid was tied, showing excellent results one month after the operation. G. S. D.

Concerning Dermoids and Dermolipomas of the Conjunctiva.

Weidler, Walter Baer, New York (*The Ophthalmic Record,* June, 1913), describes these growths, and reports two cases. G. S. D.

A Case of Nonmagnetic Steel in the Vitreous.

Allport, Frank, and Rochester, Alexander, Chicago (*The Ophthalmic Record,* June, 1913). The case showed a wound of the sclera and a foreign body lying in the vitreous. The X-ray and giant magnet were used with negative results. The eyeball was enucleated on account of a panophthalmitis, and a metal foreign body, 5 by 3 mm., composed of manganese steel, was found at the pathologic examination. This proved to be almost absolutely nonmagnetic. G. S. D.

Some Simple Attachments for Electric Hand Lamps.

Verhoeff, F. H., Boston (*The Ophthalmic Record,* June, 1913), describes a transilluminator tip made from the rubber bulb of an eye dropper. When attached to an Ever Ready pocket lamp or an electric ophthalmoscope, a satisfactory transilluminator is made.

Also a lens attachment consisting of a lens of short focus attached to the electric globe by a section of rubber eye dropper bulb. Also a perforated rotary disc for testing central color vision. G. S. D.

A Case of Gumma of the Iris After the Use of Salvarsan.

Bray, Aaron, Philadelphia (*The Ophthalmic Record,* June, 1913). Six weeks after the injection of salvarsan, patient developed on the margin of the iris a circumscribed, reddish brown growth, the size of two pins' heads. Under atropin, leaching and mercurial inunctions the tumor rapidly disappeared. Bray lays its rapid disappearance to the previous use of salvarsan. G. S. D.

Enucleation Under Ciliary Ganglion Anesthesia.

Wyler, Jesse S., Cincinnati (*The Ophthalmic Record,* June, 1913), speaks of the need of a method for removal of the eyeball without the use of a general anesthetic in patients whose

general condition is such that general anesthesia would be dangerous. He criticises the ordinary methods of enucleation with local anesthesia on the ground that the operation cannot be made painless in the presence of a tender and inflamed eyeball.

Elschnig has perfected a technic by which the local anesthetic is injected into the region of the ciliary ganglion.

Wyler has followed this method with considerable satisfaction. He finds the technic easy and the anesthesia sufficiently good. G. S. D.

A Case of Spring Catarrh: A Pathologic Report.

McKee, Hanford, Montreal (*The Ophthalmic Record*, July, 1913). Pathologic examination showed the picture of a chronic inflammatory process, with a great deal of infiltration, necrosis and destruction of fibrous tissue, followed by repair and down growth of the epithelium. The epithelium had become secondarily diseased. It had proliferated and extended into the deeper parts. G. S. D.

Two Cases of Snow Blindness.

Mathewson, George H., Montreal (*The Ophthalmic Record*, July, 1913), believes that the cornea is involved in all severe cases, and that a blister or bleb forms, corresponding to the blisters seen in sunburn of the skin. The blister bursts very early and leaves a shallow, painful ulcer. Both of Mathewson's cases showed a shallow corneal ulcer. G. S. D.

The Report of a Case of Optic Atrophy Caused by Uterine Hemorrhage.

Calhoun, F. Phinizy, Atlanta (*The Ophthalmic Record*, July, 1913). In 1901 Singer collected 198 cases of disturbance of sight due to remote hemorrhage. To this number Zentmayer has added twenty-four.

The source of the hemorrhage is the uterus or gastro-intestinal tract in fully 70 per cent.

The ophthalmic picture is usually a neuritis or an optic atrophy.

The pathologic changes appear to be degeneration of the ganglion cells, due to interferenec with their nutrition.

Calhoun's case showed blindness lasting for three weeks, and then slow restoration of sight. The field showed a partial hemianopsia. G. S. D.

Two New Cross-Cylinder Holders.

Rhoads, J. N., Philadelphia (*The Ophthalmic Record*, July, 1913), believes that these instruments are a valuable addition to the armamentarium of the ophthalmologist, and that they, as well as several duplicate trial frames, should be used to measure astigmatism, so that each case will be well checked up. G. S. D.

Heterochromia Iridium.

Williams, Carl, Philadelphia (*The Ophthalmic Record*, July, 1913). The patient never had useful vision in the left eye. About the age of fifteen the color of the left iris gradually changed from brown to blue-gray. The left pupil was somewhat dilated and did not react to light. The lens was cataractous. There was no light perception. Williams discusses the condition and reviews the literature to date. G. S. D.

Parinaud's Conjunctivitis; a Mycotic Disease Due to a Hitherto Undescribed Filamentous Organism.

Verhoeff, F. H., Boston (*Archives of Ophthalmology*, July, 1913), reviews the history of Parinaud's conjunctivitis, emphasizes as the characteristic pathologic appearance of the disease the focal areas of necrosis, and describes a minute filamentous microorganism which he found in eleven of twelve consecutive cases.

He was able to stain this organism well by a modified Gram technic, and found them occurring in masses scattered through the areas of necrosis.

He regards this organism as the specific cause of the disease, since there were no other demonstrable microorganisms in the lesions, and because these organisms occurred in such great abundance and were so situated as to explain the lesions.

He classes this microorganism as a leptothrix, and hopes soon to be able to cultivate it on artificial media and experimentally produce the disease in animals.

Verhoeff's specimens were exhibited at the meeting of the Ophthalmological Section of the American Medical Associa-

tion in Minneapolis, and seemed to bear out his claims, as far as such claims can be borne out, when the organism has not been cultivated and the disease reproduced in animals.

G. S. D.

Hypophysis Disease (From the Ophthalmologic Standpoint), With a Report of Two Cases.

Hill, Emory, Chicago (*Archives of Ophthalmology*, July, 1913), describes the development, anatomy and physiologic function of the pituitary body, and then speaks of the chain of symptoms and signs which are found in disease of this organ.

His first case was one of hypopituitarism, primary optic atrophy, and atypical visual field distortion, which suggested disease of the chiasm. Contraction of the field was chiefly on the temporal side. Operation was performed through the infranasal route, and a cyst was found. There has been no recurrence in the last two years.

The second case was one of dyspituitarism, and in general the picture was one of excessive functioning of the gland. There was temporal hemianopsia in the left eye, and the disc was somewhat atrophic. Operation was not advised, as the symptoms were not progressive. Vision stationary.

Hill goes on to consider at some length the eye symptoms of hypophysis disease. G. S. D.

Epibulbar Carcinoma; Histologic Examination of the Specimen.

De Schweinitz, G. E., and Shumway, E. A., Philadelphia (*Archives of Ophthalmology*, July, 1913). A man aged thirty-four years, with an epibulbar growth of left eye, apparently of fourteen years' duration. Growth covered the entire front of left eye; was reddish yellow in color. Eyeball enucleated. Three months later recurrence in the orbit necessitated an exenteration. Growth proved to be primary carcinoma of the conjunctiva.

Question of the invasion of the eyeball is of practical importance. In fifty-three cases collected by de Schweinitz and Shumway, perforation occurred in 37.6 per cent, and depended largely on the site of the tumor. Those at the limbus seemed to penetrate more often than those at a distance from it, since the growth extends along the penetrating ciliary ves-

sels. Therefore, growths situated at a distance from the limbus show less tendency to recur after excision.

This form of carcinoma is found most often in individuals over forty years of age. The growth in the writers' case is supposed to have originated when the patient was but nineteen years of age. G. S. D.

Toxic Amblyopia Due to Tobacco Alone.

Foster, Matthias Lanckton, New Rochelle (*Archives of Ophthalmology,* July, 1913). Patient showed V. R. 20/70, V. L. 20/200. Central scotoma for red. Temporal sides of the optic nerve heads were very white. Patient was an inveterate smoker, and seldom without a pipe in his mouth. From his statement, and from investigation, it appeared that he had taken no intoxicating liquors of any kind for over forty years. Under total abstention from tobacco and strychnia injections, the vision improved to 20/10 with correction in each eye, and only a minute central scotoma for red remained in the left eye.

This case is published to controvert the statement that it is doubtful if tobacco alone can induce disease of the papillomacular bundle of optic nerve fibers. G. S. D.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

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PHILADELPHIA.

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Analytical Examinations Concerning the Fluorescence of the Human Lens and the Lenses of Cattle.

VOGT, A., Aarau (*Klin. Monatsbl. f. Augenheilk.*, February, 1913), arrived at the following conclusions: Helmholtz's declaration that the fluorescence of the lens is whitish-blue is only partially exact. The results of other authors are not valid because of the faulty methods used. Vogt contributes these additional facts:

1. The fluorescence of these lenses exposed to the ultraviolet rays of the arc light is a bluish white light which contains all the colors of the spectrum from violet to red. This bluish white light is modified and colored greenish-yellow when it is filtered through yellow-colored lens substance and its blue and violet components thereby sufficiently weakened. The degree of this modification is dependent on: (a) The intensity of the yellowness of the lens and on the thickness of the yellow layer; (b) on the intensity of the fluorescence and on the intensity of the accompanying mixture of ultraviolet.

2. Violet light produces fluorescence only in yellow-colored lenses. Colorless lenses like those of the calf allow the violet to pass through unaffected and therefore do not fluoresce. The human lens, however, always fluoresces in violet, even in early life, as it contains yellow. Lenticular fluorescence also shows that absorption is a necessity for fluorescence.

The fluorescence produced by violet light is colored yellow-

green to yellow and qualitatively corresponds to that produced by ultraviolet, although containing no ultraviolet rays.

3. The fluorescence produced by blue has a low intensity. As its existence is also dependent on the absorption of the exciting light, a greater yellow colorization of the lens is required than when violet is used. This fluorescence contains no ultraviolet and violet components.

4. We can recognize entoptically the yellow color of the lens in the haze produced by ultraviolet light.

5. In cases where the lens is otherwise not demonstrable, its presence can be proven by the fluorescence. M. W. J.

The Significance of Anaphylaxis in Ophthalmology.

Szily, Freiburg (*Klin. Monatsbl. f. Augenheilk.*, February, 1913), sketches in some detail the various steps which have led up to the present day conception of anaphylaxis. He calls attention to the fact that recent investigations lead us to believe that there is a real difference between oversusceptibility to certain drugs and real anaphylaxis. His own work on so-called "keratitis anaphylactica" is described in detail. Of interest is his statement that as numerous investigators are a unit in saying that autogenous tissues are less toxic than those from another individual, we must modify our investigations when seeking to apply general principles or discoveries to the study of anaphylaxis as a factor in eye diseases. In connection with the question of sympathetic ophthalmia he states that up to the present time an anaphylactic inflammation has not been induced by means of a similar inflammation in the fellow eye. M. W. J.

Investigations Concerning the Increase of Peroxydase in the Conjunctiva and Its Uses.

Verwey, Rotterdam (*Archiv. f. Augenh.*, Vol. 73, Part 1, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, May 1, 1913), made these investigations to determine the effect of increased addition of ferments upon the vitality of the tissues. He found that these act favorably upon the cells, whereas astringents and antiseptics act unfavorably.

Peroxydase was found present in both acute and chronic conditions of the conjunctiva. This ferment can also be obtained pure from horseradish and milk; in the latter, however,

combined with other enzymes—katalase and reductase. The addition of one per cent boric acid prevents deterioration.

Experiments showed that 2 per cent solution of peroxydase and boric milk penetrate the tissues and cause no irritation. Saemisch's advice to instill milk in xerosis and keratomalacia is of interest in this connection.

To make the accumulation of peroxydase in the cells still more marked he resorted to instillations of hydrogen peroxid.

Boric acid, milk and 1 per cent hydrogen peroxid were instilled in turn with the following results:

1. In the secretion of the conjunctiva oxidizing ferments are not present in great numbers.

2. In smears obtained by scraping the conjunctiva, peroxydase is found more abundant in those obtained from inflamed conjunctivæ than in those from healthy conjunctivæ.

3. Peroxydase obtained from boric milk and from horseradish is taken up by the conjunctiva.

4. Two per cent peroxydase solution is nonirritating, even when used for a long period of time.

5. For clearing up corneal opacities due to subacetate of lead, peroxydase-H_2O_2 is more effectual than Guillery's tartaric acid solution.

6. In interstitial keratitis treatment with the enzyme is as effectual as mercurial medication (yellow salve).

7. In chronic conjunctival affections the peroxydase-hydrogen peroxid-peroxydase treatment should be given a trial.

A. C. S.

The Resistance of the Cornea to Tumor Invasion.

Bassolino (*Archiv. di Ottalm.*, Vol. 20, Part 10, 1913, Naples; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, May 29, 1913) arrives at the following conclusions:

1. The resistance of the cornea to epitheliomatous invasion is greater than any other tissue.

2. This is principally due to Bowman's membrane.

3. This membrane may prevent further penetration of the pathologic process.

4. When penetration does take place, dissolution of the membrane occurs.

5. In these cases microscopic examination shows plasma cells and new formation of connective tissue and vessels.

A. C. S.

Biochemic Changes in the Aqueons in Acute Intoxications Due to Methyl Alcohol or Toxipeptide.

Grignolo, Genoa (*Klin. Monatsbl. f. Augenheilk.*, February, 1913), submits the following table of results:

	Osmotic Pressure.		Index of Refraction.		Concentration in H +.	
	Aqueous.	Blood serum.	Aqueous.	Blood serum.	Aqueous.	Blood serum.
Methylalcohol intoxication.	Extraordinary rise.	Extraordinary rise.	Unchanged.	Decrease.	Changes which do not deviate markedly from the physiologic values.	Changes differing but little from the physiologic figures.
Peptone intoxication.	Unchanged.	Rise.	Unchanged.	Increase.	Unchanged.	Increase.

The difference in the behavior of the eyes, which in itself gives us a means of distinguishing the particular form of intox-

ication, also enables us to determine that the potent substances in peptone intoxication are not diffusible through the eye, whereas they are in methyl alcohol intoxication. These facts can probably be attributed to a distinct selective quality of the epithelial cells of the ciliary body. M. W. J.

Experimental and Clinical Tests Concerning Chemotherapy in Diplobacillus Infection of the Eye.

Gerb (*Mucnch. med. Woch.*, 1913, No. 18; Abst. in *Woch. f. Ther. u. Hyg. des Auges,* June 12, 1913) reports on the results of his experiments with anilin dye stuffs in combating infection with the diplobacillus. He found that a number of these dyes, independent of their chemical composition, had a more or less destructive action upon the bacillus. He then selected the dye stuffs which were the most potent in the greatest dilution and nonirritant. A mixture of these proved very efficacious and harmless in both animal and human eye. A bactericidal action probably takes place.

In conjunctival infections the results were most favorable: in keratitis, however, not quite so satisfactory, owing probably to the location of the bacteria in the deeper tissues.

Excepting the staphylococcus albus, other conjunctival bacteria were not affected by the mixture. He found that pyoctaninum aureum hardly influenced the growth of the diplobacillus, whereas pyoctaninum ceruleum was equally as effective as the author's color mixture. A. C. S.

Concerning the Employment of Abderhalden's Method of Dialysis in Ophthalmology.

Hegner (*Mucnch. med. Woch.*, 1913, No. 21; Abst. in *Woch. f. Ther. u. Hyg. des Auges,* July 10, 1913). Using Abderhalden's method of dialysis, Hegner examined the serum of a number of patients with uveal disease for the presence of specific uveal ferments. He studied cases of sympathetic ophthalmia, perforating injuries of the globe, nontraumatic inflammations of the uvea, and, for comparison, normal eyes. The results of the examination showed that in certain cases of ocular disease ferments occur in the blood which are specific for uveal tissue. The cases with positive reaction form a characteristic group with typical clinical symptoms. Pro-

tective ferments are particularly liable to occur after a perforating injury leading to a chronic uveitis.

The demonstration of specific ferments was most striking in a case of fresh sympathetic ophthalmia. The reaction was generally negative in perforations not followed by inflammatory reaction (cataract extraction) and in nontraumatic inflammations of the uvea. In a case of punctured wound of the eye with iris prolapse, it was possible during the various stages of inflammation to demonstrate the appearance and disappearance of protective ferments, the formation of ferments being most active during the acute stages, a negative reaction being obtained after subsidence of inflammation.

The presence of these specific ferments in sympathetic disease and in cases liable to sympathetic inflammation suggests a possible causal relationship of these processes to sympathetic disease. A. C. S.

Concerning the Anatomy of the Human Albinotic Eye.

Elschnig (*Prager med. Woch.*, 1913, No. 23; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, July 17, 1913). Anatomic examination of the eyes of a completely albinotic girl showed, instead of normal pigment granules, minute yellowish brown pigment globules in the pigment epithelium of the iris and ciliary body. The entire retinal pigment epithelium contained a finely granular light yellowish pigment, particularly dense at the macula. Needle-shaped pigment was entirely lacking. No fovea centralis was demonstrable.

The nerve fiber layer in the area centralis was markedly reduced, the ganglion cell layer, however, appearing as in the normal eye in the region of the fovea centralis. There was fusion of the external nuclear and granular layers. In the area centralis the rod cone layer resembled the conditions in the normal foveal region; at the retinal center, however, there was an entire absence of cones and rods.

Elschnig claims the albinotic eye results from developmental inhibition; it is not a malformed eye.

Careful examination of a number of albinos with the Gullstrand ophthalmoscope showed deficient development of the central retinal region to be the rule in albinotic eyes.

A. C. S.

On the Decrease of Intraocular Tension in Diabetic Coma.

Herrfl (*Muench. med. Woch.*, 1913, No. 22; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, July 31, 1913) found in no other comatose or cachectic condition such a marked hypotonus of the eye as in diabetic coma; a complication, however, not always indicative of an unfavorable prognosis. He ascribes the condition to a probable disturbance of the osmotic ocular processes.

The experimental administration in rabbits, by the mouth and intravenously, of sod. butyrate, sod. isovalerianate, sod. chlorid, sulphate, phosphate, acetate, bicarbonate, sugar and urea resulted in a similar ocular hypotonus. Sometimes normal tension appeared several hours after infusion. In extreme hypotonus the return to normal was hastened by the injection of normal salt solution. Decreased tension was found to be due to loss of water. Chemical analysis revealed a transference of the injected substances from the blood to the ocular fluid. There was no apparent relationship between hypotonus and blood pressure. A. C. S.

Stransky's Glaucoma Simplex Theory.

Stransky, Bruenn (Author's abstract in *Woch. f. Ther. u. Hyg. des Auges*, July 24, 1913), considers glaucoma simplex not the result of increased tension, but due to a scleritis indurativa leading to new formation of connective tissue and to increased scleral rigidity. The increased hardness of the globe in glaucoma simplex is, therefore, due to increased rigidity of the scleral covering, and not to any increase of intraocular tension. When the globe is palpated digitally or by instruments, two factors are under examination, namely, scleral rigidity and scleral tension. The summation of these two factors equals the bulbar resistance. Scleral tension is proportional to intraocular tension, but inversely proportional to the rigidity of the sclera.

If a hard eye exhibits increase of volume, there must exist increased tension. However, if a hard eye shows a decrease of volume, decreased tension exists, and the eye is hard because of scleral rigidity. Only in the former instance is glaucomatous disease present. In the hard small eye is found a scleritis indurativa.

The optic nerve excavation in glaucoma simplex is also dependent upon increased scleral rigidity, and not upon increased intraocular tension. The decrease in size of the globe is associated with decrease in size of the scleral foramen, which results in gradual increase in size of the physiologic excavation of the lamina. The lamina gradually recedes into the retrolamellar space, the nerves fibers, however, remaining stationary. This is the stage of gradual deepening of the excavation without ophthalmoscopic alterations of the nerve substance, and without signs of visual impairment. When a point is reached where the medullary substance begins, resistance is offered and the lamina becomes pressed against the nerve fibers, the central fibers, those supplying the periphery of the retina, being the first to suffer.

With this theory in mind, Wicherkiewicz devised his lattice (Gitter) sclerotomy, and has so far gotten excellent results. A paper by the author concerning a modification of this procedure is now in preparation. A. C. S.

Noguchi's Luetin Reaction in Ocular Disease.

Loewenstein (*Med. Klinik*, No. 11, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, June 19, 1913) tried the luetin reaction in twenty cases of hereditary metasyphilitic and gummatous affections of the eye. The luetin reaction is a spirochete reaction; therefore, it is not surprising to find cases of hereditary lues (evidently metalues) with negative Wassermann reacting positively to luetin. If in many cases of hereditary or metaluetic affections, despite negative Wassermann, a positive luetin reaction is obtained, it would indicate the presence of spirochetes or their reaction products. A. C. S.

Herpes Zoster Frontalis With Positive Bacteriologic Findings in the Gasserian Ganglion.

Sunde (*Deutsche med. Woch.*, No. 18, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, June 19, 1913) reports a case of herpes zoster frontalis complicating a bronchopneumonia which resulted fatally. An autopsy performed sixteen hours after death showed the Gasserian ganglion on the side of the herpes enlarged, due to an acute inflammatory process. Sections of the ganglion showed a number of Gram positive cocci arranged after the manner of diplococci or in short chains.

A. C. S.

A Peculiar Case of Keratomycosis Aspergillina.

Lindner, Vienna (*Graefe's Archiv. f. Ophth.*, Vol. 85, Part 1, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, August 7, 1913), reports a case due to infection with aspergillus fumigatus. Instead of the lesion exhibiting the usual dry, crumbling surface, it appeared smooth and succulent.

A. C. S.

Subconjunctival Luxation of the Lens.

Génet (*Ann. d'Ocul.*, April, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, July 31, 1913) reports the case of a man who while standing on a ladder was kicked in the eye by a man above him. The lens of the right eye was found beneath the conjunctiva at the insertion of the external rectus, the lenticular margin being tangent to the corneal margin. There was no visible rupture of the sclera. There was a coloboma temporally, as if a broad iridectomy had been performed. The nasal bones were fractured and slight orbital emphysema was demonstrable.

The writer reviews thirty-three previously reported cases of subconjunctival luxation of the lens and discusses the mechanism. He believes that besides intraocular tension, the traction of the recti muscles is an important etiologic factor. One of the muscles is usually torn loose from its insertion, and this explains why the luxated lens is generally found at one of the points of insertion of the recti muscles. The scleral opening is produced by splitting of the circular scleral fibers, this opening closing spontaneously after extrusion of the lens. The apparent coloboma in the above cited case was the result of the iris having been pushed backward, its posterior surface subsequently becoming attached to the ciliary processes.

A. C. S.

Concerning Traumatic Opacities of the Cornea.

Meller (*Graefe's Archiv. f. Ohrenhk.*, Vol. 85, Part 1, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, August 14, 1913) reports the histologic findings in two cases. While this affection has generally been ascribed to lesions of Descemet's membrane with subsequent edema of the posterior layers, in Meller's cases these layers were intact. He attributes the opacity to fluid exudation between the crushed superficial

corneal lamellæ, followed later by a true edema because of circulatory disturbances. He believes the same explanation holds for opacities due to obstetrical traumatism.

A. C. S.

The Effect of Subconjunctival Salt Injections Upon the Intraocular Complications of Highgrade Myopia.

Mallwitz (*Inaug. Diss. Rostock,* 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges,* August 14, 1913) believes that subconjunctival salt injections stimulate metabolism and absorption. He cites twenty-eight cases of high myopia from the Rostock clinic, treated with subconjunctival injections of normal salt solution. Of these, twenty-two showed disease of the macula, eighteen vitreous opacities, and eleven marked conus formation. In twenty-one cases this method of treatment resulted in distinct visual improvement, in five no change occurred, and in one vision became slightly worse.

He then, for comparison, refers to sixteen cases of high myopia treated with the Heurteloup apparatus, 1901-1905, the percentage of improved cases being about the same as after the above method of treatment. However, on account of the many drawbacks of this method, he prefers the treatment with subconjunctival injections. A. C. S.

A Case of Necrotic, Hemorrhagic Ulcer With Concentric Enlargement From the Sclera to the Cornea.

Murakami (*Klin. Monatsbl. f. Augenheilk.*, February, 1913). The scleral ulcer formed part of a metastatic process staring in a streptococcic infection of a tooth. The patient died of sepsis. M. W. J.

Large Scleral Rupture Followed by Normal Vision.

Wachtler (*Med. Klinik,* No. 3, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges,* June 12, 1913). The eye showed in the temporal portion a right angular rupture of all the ocular coats, one side measuring 10 mm., the other 15 mm. There was a 3 mm. gap, containing some vitreous. The wound edges, however, were fairly smooth and regular. The anterior chamber was filled with blood. Four scleral sutures, scopolamin, binoculus, ice bag, sweats. The patient made an uneventful recovery and was discharged with 5/8 vision. Two years later vision was 5/5. A. C. S.

Zonular Cataract and Tetany.

Hesse and Phleps (*Zeitsch. f. Augenh.*, Vol. 29, Parts 3 and 4; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, June 5, 1913) found in forty-three cases of zonular cataract, thirty-five with unmistakable symptoms of tetany, bone rhachitis occurring in only six cases. Among the eight without symptoms of tetany, only one case showed positive rhachitic signs.

In other forms of cataract, usually total cataract, in the young tetany is frequently demonstrable. In twenty-one out of thirty-four cases dental lesions were also observed.

If doubtful cases had been included in the study of the cases of zonular cataract, tetany would have complicated 90 per cent. It seems, therefore, probable that in these cases of zonular cataract tetany is the etiologic factor. The lenticular changes are, however, not caused by convulsions, both manifestations being due to insufficiency of the parathyroids.

A. C. S.

The Treatment of Iron Splinter in the Lens.

Ammann (*Klin. Monatsbl. f. Augenheilk.*, February, 1913) describes a case in which a steel splinter produced a cataract in a lens which had remained clear for eight weeks after the accident. Whether the cataract was due to the trauma or to the splinter per se was the point in question. M. W. J.

Cases of Spontaneous Iridocyclitis With Histologic Findings Resembling the Picture of Sympathetic Inflammation.

Meller (*Vienna Ophthalmol. Society*, June 2, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, July 3, 1913). Two such cases have already been reported from the Fuchs clinic. Meller contributes two more. In the first case, a fifty-four-year-old woman, the inflammation confined itself to one eye, which was enucleated. In the second, a forty-seven-year-old man, both eyes were involved. In both cases, after the subsidence of inflammation, increase of tension ensued, necessitating iridectomy. The histologic findings were typical of sympathetic disease. Since the operations were not performed until after the inflammation had subsided, Meller excludes traumatism as an etiologic factor. In previous communications he has referred to an endogenous mode of infection, to the possibility of sympathetic disease occurring without previous perforation of the globe. A. C. S.

Bilateral Macular Disease After a Short Circuit Injury.

Knapp, Paul, Basel (*Zeitsch. f. Augenhk.*, Vol. 24, Part 5; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, July 19, 1913), reports a case of electric injury of the eyes due to a short circuit flash occurring 40 to 50 cm. from the face of the thirty-nine-year-old patient. There was no electric shock. The lower half of the flash was obscured by an aluminum rail. Following a brief period of local irritation there ensued misty vision associated with the appearance of half oval clouds, and later metamorphopsia.

Six weeks after the accident Knapp found normal media in each eye, but beneath each fovea a half oval chorioretinal lesion of the same size and shape. The lesions were fairly well circumscribed and surrounded by a dirty light red area containing small pigment masses, white and yellowish specks.

Treatment with k. i., subconjunctival injections and protective glasses, resulted in normal vision and a slight decrease in size of the lesions.

The exact impression of the exposed portion of the flash (150,000 candle power) upon the retina is of interest, the injury being undoubtedly caused by the visible rays. According to Birch-Hirschfeld the ultraviolet rays which are not absorbed by the lens are more liable to injure the inner retinal layers. A. C. S.

A Noteworthy Case of Acute Double-Sided Retrobulbar Neuritis With Blindness, Terminating in Recovery of Vision in One Eye After Thirty-three Days' Amaurosis.

Augstein, Bromberg (*Klin. Monatsbl. f. Augenheilk.*, February, 1913), considers the process as intracranial because of the clinical picture, i. e., no pain on moving the eyes or on pressure, but severe headache and general malaise with no change in the papilla until after the subsidence of the process, when a mild degree of temporal pallor appeared in the left eye. M. W. J.

Rupture of the Optic Nerve Near Its Bulbar Attachment Due to Blunt Traumatism.

Krauss (*Muench. med. Woch.*, 1913, No. 23; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, July 31, 1913) reports such a case in man whose left eye was struck with a piece of wood weighing 400 grams. Immediately after the accident there

was ecchymosis of the lids, subconjunctival hemorrhages, moderate exophthalmos and inactive pupil. Ophthalmoscopic examination revealed extensive preretinal and retinal hemorrhages, especially in the vicinity of the disc region. The disc itself could not be seen. There was loss of light perception.

After absorption had taken place, the indirect method revealed in the disc region a poorly defined white oval with a grayish center. Vessels were visible only at the lower inner margin; in the cloudy vitreous a floating severed retinal vessel was discernible. There were still hemorrhages at the upper inner disc margin, and at the upper margin chorioretinal changes. The ophthalmoscopic picture simulated coloboma of the optic nerve.

A Case of Double Perforation of the Globe.

Krauss (*Muench. med. Woch.*, 1913, No. 23; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, July 31, 1913). This case occurred in a man who consulted the writer because of an episcleritis. Ophthalmoscopic examination revealed a broad, grayish white strand traversing the vitreous, the posterior end terminating in a localized chorioretinitis, the anterior attachment not being visible. The patient confessed to a steel injury six years previously. Sideroscopic examination proved positive. The fragment was found outside of the sclera, beneath the external rectus. After removal the pain on turning the eye disappeared. A. C. S.

Contribution to the Etiology of Chronic Disease of the Lacrimal Structures.

Brenzlow, Bonn (*Zeitsch. f. Augenhk.*, Vol. 29, Part 5; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, July 19, 1913), made a rhinologic examination in every case of lacrimal disease at the Bonn eye clinic during the past eighteen months. The results of his investigations are thoroughly in accord with the stand taken by Kuhnt, viz., that in the etiology of lacrimal disease the sinuses are of more importance than affections at the opening of the nasal duct.

In sixty-three patients with dacryocystitis, endonasal changes occurred in all but two. Seven cases showed nasal changes unassociated with sinusitis. In the remaining fifty-four cases sinus disease was positively demonstrated in forty

and suspected in fourteen. The maxillary and ethmoidal sinuses were the sinuses usually involved. In no case was ethmoidal involvement entirely absent, and in thirteen cases the ethmoid alone was diseased. In nine cases there was marked disease of the antrum, and in eighteen there were signs of previous maxillary inflammation.

Regarding treatment, Kuhnt recommends the following procedure: In recent cases, without marked stenoses, after treatment of nasal complications, irrigation, probing and, if necessary, incision of stenoses. In old cases with tough adhesions, removal of the tear sac or Toti's operation with simultaneous curettage of the anterior ethmoidal cells or antrum, and correction of abnormalities of the middle turbinate.

A. C. S.

Dacryocystitis.

Wessely (*Physik. med. Gesell.*, Wuerzburg, February 6, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, May 29, 1913) advocates the injection of a few drops of tincture iodin into the diseased sac through a platinum canula. Prior to the injection a probe is introduced and kept in the canal twenty-four hours. In twenty-four out of thirty-two cases, after one to four injections, a complete cessation of secretion occurred. Simultaneous treatment of coexisting nasal affections is of importance for a permanent cure. A. C. S.

Lacrimal Sac Prothesis.

Zimmermann, Goerlitz (*Woch. f. Ther. u. Hyg. des Auges*, July 3, 1913). To demonstrate the tolerance of the human organism to aseptically introduced foreign bodies, the writer (before the Naturforschenden Gesellschaft in Goerlitz, 1913) exhibited a patient with a silver sac prothesis which he had inserted in 1907. The prothesis was still in good position and acted as an effectual drain, no epiphora being complained of by the patient. When he first showed cases operated upon in this manner, at the Naturforscher Kongress in Dresden, 1907, Kuhnt predicted extrusion of the prothesis and spoke of possible ensuing bone disease. However, on account of the tedious postoperative care necessary after a prothesis operation, Zimmermann has given up this method in favor of extirpation of the sac combined with removal of the palpebral lacrimal gland. A. C. S.

On Alcoholic Reflex Pupillary Inaction.

Mees, Mainz (*Muench. med. Woch.*, 1913, No. 22; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, July 24, 1913), reports such a case in a fifty-eight-year-old alcoholic, the clinical symptoms comprising polyneuritis, epilepsy and Argyll-Robertson, miotic pupils. Tabes and other metaluetic affections could be excluded, and besides the Wassermann was negative. The disappearance of epileptic attacks with the withdrawal of alcohol also argued against a luetic etiology of the epilepsy. He considers the case one of probable alcoholic pseudotabes. A. C. S.

Enophthalmus on Separating the Lids.

Ruebel, Freiburg (*Klin. Monatsbl. f. Augenheilk.*, February, 1913). In a male showing great emaciation, on separating the lids widely the bulbi sank back into the orbits and the motility of the eyes was restricted when voluntary movements were attempted. Ruebel quotes Axenfeld and Foster, who explained the phenomenon on the ground that the muscles were drawn closer to the orbital wall by their fascial attachments when the lids were drawn forward, the funnel-shaped cavity in which the globe lies being thereby enlarged. Owing to the air pressure the eyeball sinks backward.

M. W. J.

Ring Scotoma Proceeding From the Blind Spot (Socalled Bjerrum's Sign) in Cerebral Choked Disc.

Szily, Freiburg (*Klin. Monatsbl. f. Augenheilk.*, February, 1913), believes that this sign can be accepted as a symptom of choked disc threatening grave results and an indication for further operative interference. He also points out that Bjerrum's sign is likewise found in nonglaucomatous eyes.

M. W. J.

Restoration of Vision in a Blind-born.

Moreau (*Ann. d'Ocul.*, February, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, May 29, 1913). The case in question was an intelligent eight-year-old boy, blind since birth, the cause of blindness being bilateral cataract. After operation the boy was kept under close observation for fifteen months, during which time he was given reading lessons. From a careful study of this case he concludes that after an

operation for restoring the visual function, a blind-born individual is nevertheless unable to see. It is necessary first to develop the occipital lobe by systematic visual exercises persisted in for many months.

In retarded development of the ocular apparatus, one should not operate too late, nor too soon—at a time when there is lacking the intelligence necessary for successful visual training.

After ophthalmia neonatorum with intact posterior structures, iridectomy should be performed as early as possible.

A. C. S.

The Technic of Cataract Extraction.

Best (*Muench. med. Woch.*, 1913, No. 16: Abst. in *Woch. f. Ther. u. Hyg. des Auges,* May 22, 1913) uses a very broad lancet, which he claims shortens the healing process and results in only slight astigmatism. Eleven millimeter incisions can be made with this knife. A. C. S.

The Elliott Trephine Operation.

Meyerhof (*Gaz. med. de Paris,* No. 88, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges,* June 19, 1913). By means of the Elliott operation a well proportioned subconjunctival fistula is obtained. The technic is very simple. Dropping of the small excised portion into the anterior chamber is a rare complication. In primary or secondary chronic glaucoma this operation is superior to iridectomy and sclerectoiridectomy and all similar operations. It is particularly to be recommended in advanced cases of chronic glaucoma in which iridectomy is of no avail and frequently dangerous. A decided reduction of tension is obtained by this method.

A. C. S.

Technic of the Limbus Trephining Operation.

Schnaudigel, Frankfort (*Klin. Monatsbl. f. Augenheilk.*, February, 1913) does not approve of Mende's suggestion in the last number of this journal regarding the form of flap to be used in the Elliott operation. Schnaudigel believes it is inadvisable to detach the conjunctiva along the limbus for fear of change in the position of the flap and subsequent closing of the trephined opening. M. W. J.

The Opening of the Lacrimal Sac From the Nose in One Hundred Cases of Dacryostenosis.

Wust, Berlin (*Berlin. klin. Woch.*, 1913, No. 20; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, July 24, 1913), operated as follows: Under local anesthesia the mucosa covering the lacrimal protuberance is removed and a piece of the ascending ramus of the maxilla and lacrimal bone chiseled away. The inferior turbinate is not disturbed. After exposure of the sac the nasal wall is excised and direct artificial communication made between the eye and nose above the intact lower turbinate.

In 90 per cent of the cases, which included cases of epiphora, dacryocystitis, dacryoblennorrhea, phlegmonous dacryocystitis and lacrimal fistula, excellent results followed this procedure. A. C. S.

Concerning Neuritis After Salvarsan Therapy.

Wernicke (*Zeitschr. f. Augenh.*, Vol. 30, Part 5; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, July 10, 1913). In ten cases of neuritis or neuroretinitis, nine suggested a salvarsan etiology, while no analogous case was observed after mercurial treatment. Moreover, no further case of neuritis was observed after the discontinuance of salvarsan in Odessa, the drug being discontinued because of a fatal ending in one instance.

He believes that salvarsan therapy increases the liability to neuritis which is a neuritis of luetic origin. In support of this view he refers to the specific action of Hg. in these cases and to the splendid result obtained in one case by another injection of salvarsan. A. C. S.

Hetol Instillation in Iritis.

Colin (*Muench. med. Woch.*, No. 18, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, June 19, 1913) reports success with hetol in three cases of iritis. Two were undoubtedly of a tuberculous nature, the third probably tuberculous.

Following the instillation of 3 per cent cocain he instilled 2 to 5 per cent hetol and 1 per cent novocain dissolved in normal salt solution, this procedure being repeated every other day, and the number of drops gradually increased.

A. C. S.

Pellidol and Azodolen in Ophthalmology.

Haass, Viersen (*Woch. f. Ther. u. Hyg. des Auges*, July 24, 1913), refers to the marked clearing of the cornea obtained with scarlet red ointment in three cases of lime burn of the cornea, and mentions two new derivatives of scarlet red—pellidol and azodolen—which lack the disagreeable staining property possessed by scarlet red.

Pellidol is a diacetyl derivative of amidoazotoluol; it is insoluble in water, but soluble in ether, alcohol, vaselin and oils. A 2 per cent ointment usually suffices.

An additional antiseptic action is procured by combining pellidol with an albuminous iodin preparation (iodolen), which contains 30 per cent iodin. A mixture of equal parts of pellidol and iodolen is sold under the name of azodolen.

The writer found both preparations unirritating and of value in phlyctenular affections of the eye, massage every other day with pellidol or azodolen ointment acting very favorably. In refractory relapsing eczematous keratitis especially good results were obtained. In a few of these cases he resorted to an oily solution with or without a mydriatic.

In uncomplicated corneal infiltrates with intact epithelium the results were less favorable; not until the epithelium had broken down did a favorable result follow. In superficial abrasions of the cornea the drugs act disadvantageously, causing hyperproduction of epithelium, thereby keeping the eye irritated for days. In infectious conditions of the conjunctiva no striking results were obtained. A. C. S.

Euphos Glass in the Army and Navy.

Meyer (*Woch. f. Ther. u. Hyg. des Auges*, July 3, 1913) gave euphos glass a thorough trial while on a three weeks' cruise on a man of war. His experience with this glass, under most variable conditions, was so satisfactory that he is convinced it will prove serviceable in both the army and navy.

Wearing such glasses, he found the dazzling due to the reflection of the sun's rays by the water, the glare of search lights, etc., distinctly lessened without visual acuity being impaired; on the contrary, he frequently noticed improvement of vision. For example, when his boat was leaving the harbor the sun was directly behind, and it was impossible to

discern that part of the coast line with the glare, but with euphos glasses the coast line appeared continuous.

He also contends that with these glasses vision at twilight is improved, because the shadows appear intensified, and that prolonged wearing of the glasses results in more rapid dark adaptation, a factor which certainly ought to prove of value in these days of modern warfare, with night marches and night engagements rather the rule than the exception.

A. C. S.

Noviform.

Clausen (*Zeitschr. f. Augenh.*, Vol. 29, Parts 3 and 4; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, May 29, 1913) writes of the uses of noviform ointment in external ocular affections. Favorable results followed the use of the ointment (5 to 10 per cent) in marginal disease of the lids. In phlyctenular affections, however, he prefers the more irritating yellow salve and calomel. The ointment is also of value in abrasions and erosions of the cornea. A. C. S.

The Ocular Changes Due to the Action of Light Rays.

Schanz (*Deutsche med. Woch.*, No. 8, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, May 29, 1913) discusses the action of different rays of light on the eye, furthermore the conditions when it suffices to merely exclude the rays which are not directly perceived as light—exposure to intense artificial lights, snow, etc., in glass blowers, hunters, in patients after cataract extraction, etc. In these cases euphos glass is the most suitable. A smoked euphos glass is necessary when the visible rays require weakening. Fieuzal glass acts similarly. A. C. S.

Dazzling Through Association.

Isakowitz, Berlin (*Klin. Monatsbl. f. Augenheilk.*, February, 1913), has observed a sensation of dazzling when reading descriptions of dazzling objects, such as the sun or a reflecting surface of water. This sensation can rise to the point where the printed page becomes indistinct. Analogous phenomena involving other senses have been observed. Stimulation of the ganglion cells of the cortex associated with the free play of the imagination is not, as a rule, productive of as bright a picture as when the stimulus comes through the

peripheral nerves. That the results of the two forms of stimulus may be equal is a fact, however. Real and imaginary dazzling are cortical processes. When we view them in their relationship to the outer world, they are equally real, and we can recognize from this example the subjectivity of our conception of the world about us. M. W. J.

An Achromatic Spectacle Loupe of Magnifying Power.

Rohr and Stock, Jena (*Klin. Monatsbl. f. Augenheilk.*, February, 1913), have devised a binocular loupe which permits the user to look about him without removing same. They have combined the lenses with the ametrope's correction. Gullstrand demonstrated the instrument at the Swedish Congress of Ophthalmologists one year before the appearance of this paper. M. W. J.

Fragments From the History of Spectacles.

Greeff, Berlin (*Klin. Monatsbl. f. Augenheilk.*, February, 1913), describes spectacles held in place by means of leather straps. They resemble the present-day automobile goggle. Others were fastened by means of cords. Both were in use during the sixteenth century. He also describes a pair of spectacles held in place by means of weights hanging behind the ears. In the fifteenth century the spectacles were occasionally attached to a close-fitting cap. Both the weighted and cap spectacles were used up to a short time ago in the Orient. In the Amsterdam Museum is a pair of spectacles attached to a jointed rod which runs upwards and is then attached to the cap. This form is seen in various pictures of the sixteenth century. All of these spectacles had large round convex lenses. M. W. J.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

M. W. Frederick, M. D.,

SAN FRANCISCO.

AND

Jesse S. Wyler, M. D.,

CINCINNATI.

A New Method of Exenteration of the Globe in Panophthalmitis.

Sameh Bey, Cairo (Un nouveau procédé d'exenteration de l'oeil dans la panophtalmie, *La Clinique Ophtal.*, May, 1913), prefers exenteration to enucleation in panophthalmitis, because there is less danger, it is more rapid, easier and gives a preferable esthetic result. Bey makes a median keratotomy and evacuates the contents through this opening by holding the wound edges apart. The interior surface of the sclera is cleansed with cotton saturated with a solution of cyanid of mercury or 4 per cent phenol, and then one suture through the lips of the wound completes the procedure. At times the incision is made along the limbus, either above or below, involving half the circumference. In cases of traumatism the incision is made along the meridian of the injury.

This operation was performed 475 times in cases which Sameh divides into two large divisions: panophthalmitis of ectogenous and of endogenous origins; and the former into two branches; those caused by infected injuries, and those from old thin leucomata. A table of the varieties seen, with the sex of the patient, is added, and this shows that only 14.31 per cent of the cases were of endogenous origin. J. S. W.

Fistula of the Cornea and Iridectomy.

Sameh Bey, Cairo (Les fistules cornéennes et l'iredectomie, *La Clinique Ophtal.*, May, 1913). Corneal fistulæ which at times complicate sluggish ulcers show merely a small black

point surrounded by a grayish scar, and no anterior chamber, because of the continual escape of aqueous. These openings are at times near the center of the cornea, at others, just anterior to the pupillary border of the iris, which is always adherent to the corneal scar. For cases of this kind the author has very effectively performed iridectomy. This operation is often very difficult, as no chamber is present, but by inserting the lance only just through the corneal layers and extending the incision laterally, it may be accomplished in every attempt. Sameh has had sixty-five experiences in his work, five cases of which he reports fully in his communication.

The iridectomy seems to favor the nutrition of the eye and is equally efficacious in the treatment of keratocele, in which condition cicatrization and healing is rapidly brought about.

J. S. W.

A Prevention Against the Loss of Vitreous During a Cataract Operation.

Ferentinos, Patras, Greece (Pour éviter l'issue du corps vitrè pendant l'operation de la cataracte, *La Clinique Ophtal.*, June, 1913), mentions that this complication is not always the fault of the operator, but often is due to a slight increase in intraocular tension. He, therefore, immediately after disinfecting the eye, before the operation, applies a tight compression bandage, and by means of this so diminishes the pressure and compresses the extrinsic muscles that the eye is in a most favorable condition for proceeding, following the removal of the bandage. This is especially advantageous in those cases where there is a raised tension. J. S. W.

Cure of a Large Epibulbar Epithelioma by Means of X-Ray and Radium.

Grandclément, Lyon (Guérison d'un vaste épithélioma épibulbaire de l'oeil par emploi des rayons X et du radium, *La Clinique Ophtal.*, June, 1913). A woman sixty years of age had a swelling about almond size, extending from the limbus to the caruncle. It was not ulcerated, and had started at the limbus many years previously. As the mass was too large to excise, the author had it exposed to the X-ray, and a month later nothing remained but a roughened red surface. A month following this a lesion of the same variety appeared on the

edge of the upper lid, the size of a large pea. Two applications of radium cured this in eight days. The author comments upon the advisability of the rays in such cases to prevent great loss of tissue. It is possible to have a recurrence, especially in the eye, as the delicate tissues contraindicate a strong exposure. This is the first tumor of the kind cured by the above mentioned means. The X-ray is advised for

(1) All cases of epitheliomas and sarcomas, hard cancers and lipomas.

(2) Majority of cases of dermatitis, dry or moist.

(3) All varieties of vascular affections and angiomas.

J. S. W.

Two Cases of Sympathetic Ophthalmia Improved With Salvarsan.

Marxolesco, Bukarest (Sur deux cas d'ophtalmie sympathetique améliorés par le salvarsan, *La Clinique Ophtal.*, June, 1913). Authors vary as to the efficacy of this remedy in sympathetic conditions, with quite a number of reports for and contrary to its use. The author reports two cases with excellent termination. The first was a forty-five-year-old tailor operated upon for cataract, followed in three months by an iridocyclitis. The other eye was affected a month later, so that fingers could be counted at 2½ m. with each eye. No history of syphilis. Appearance was that of a typical fibrinous uveitis. Mercury and iodid in large quantities furnished no relief, vision dropping to 1½ meters. After an intramuscular injection of salvarsan 0.6, fingers counted at 4 meters. Steady improvement and he left the clinic two and one-half months later with dilated pupils, few synechiæ, clear fundus. Vision O. D. = 2/3; O. S. = 1/3. Local treatment with atropin and dionin during the entire period. Four months later vision had remained the same.

The second case was a child of eight years, with an atrophic eye, following a knife injury. The other eye had begun to fail six months previously with photophobia, epiphora, injection and pain. It showed injection, precipitates on posterior surface of cornea, adherent pupil and pigment deposits. Distinguished fingers at 3 m. Wassermann negative. Usual treatment no avail, so salvarsan 0.3 injected intramuscularly. Slow improvement for three weeks, when the sight was 10/20 and has remained in this state.

The use is purely empiric, as the action is unexplained; however, judging from the evidence, it surely does no harm to use salvarsan in this type of cases. J. S. W.

Glaucomatous Vertigo.

Dor, Lyons (Le vertige glaucomateux, *La Clinique Ophtal.*, June, 1913). Oculists recognize varieties of vertigo due to paralyzed muscles or poor correction, which disappear when eyes are closed. On the contrary, vertigo of glaucomatous origin continues even after blindness has set in. It seems to resemble in its mechanism Meniere's disease, which is also due to pressure, although in a different locality. This vertigo is only brought out by examining for it, as the patient never voluntarily mentions the fact. It was brought to the author's notice by an old patient, who, after an enucleation for absolute glaucoma, was relieved of his dizziness, but this recurred eighteen months later, when the other eye was affected. Three distinct cases are reported, with relief through operative measures. One cannot pretend that the vertigo is a coincidence in glaucoma patients, and that it is of stomachic, arteriosclerotic, labyrinthine or cerebellar origin. The practical results of these observations lie in the fact that in the presence of an incurable glaucoma regarding vision, it is advisable to interfere surgically to relieve this vertigo and thus allow the patient to enjoy the sight in the other poor eye. J. S. W.

Basedow's Exophthalmus With Pronounced Necrosis of the Right Cornea and Ulceration of the Left Cornea—Double Suture of the Lids.

Terson and Terson (Exophtalmie basedowienne avec nécrose avancée de la cornée de l'oeil droit et ulceration de la cornée de l'oeil gauche, double suture des paupières, *La Clinique Ophtal.*, June, 1913) report a case of a patient fifty-four years old presenting all the symptoms of Basedow's disease well exaggerated. More than the lower half of the right cornea was ulcerated, infiltrated with pus, with hypopyon filling entire anterior chamber. Inability to close the lids because of the protrusion and chemosis. The author decided to perform a median tarsorrhaphy sufficiently large to cover the cornea, and await results before enucleating. Following this intervention all danger of a panophthalmitis disappeared, and

the condition resolved into a leucoma of the cornea, as the patient came too late for a better result. The condition continued for a month, and then the left eye became involved by a small ulceration appearing upon the apex of the cornea, produced by nonclosure of the lids. The lesion progressed for two days, despite great care, when the median tarsorrhaphy was performed. Eight days after, complete healing with a diminishing exophthalmus demonstrated that the other eye could have been saved in like manner through early intervention, and that the continuous pressure of the lids contracts the dilated vascular tisue and reduces the protrusion. The variety and extent of the tarsorrhaphy depends upon amount of involvement present. J. S. W.

Subconjunctival Injection of Neosalvarsan.

Darier (Injections sous-conjonctivales de neo-salvarsan, *La Clinique Ophtal.*, June, 1913) has tried instillations of an aqueous solution of 2 per cent neosalvarsan with the result that the first is well supported, but the second and third are very painful. The two cases in which this method was tried showed no improvement. Attempts with massage, using a 2 per cent mixture in lanolin, were also unsuccessful. Cohn, Bachsteg, Hoehl and Rosenmeyer tried local treatment with neosalvarsan, and all were dissatisfied except the last named author. Following these failures, subconjunctival methods were attempted. Brief reports of his cases are tabulated. In eleven observations, three good results were surely due to the drug, despite the fact that Igersheimer has tried the method and reports that all local treatment is absolutely useless in cases of parenchymatous keratitis. The article is not very convincing. J. S. W.

Siderosis of the Eye.

Danis (La sidérose de l'oeil, *Le Progrès Medical*, June, 1913) mentions that metallic fragments produce both immediate and late complications. The immediate ones are of the mechanical nature, such as lacerations of the different membranes, detachments and luxations, with their subsequent lesions, as iridodialysis, pearl cysts and cataracts. These lesions depend upon the force of the traumatism and the size of the foreign body. Then the infections of bacterial origin

come in this division. These complications are quite frequent and cannot be averted.

The late results are of chemical effect (siderosis) and irritative origin (glaucoma and sympathetic ophthalmia). Siderosis is due to the impregnation of the tissues with insoluble iron salts, forming ferrous carbonate and oxid of iron. The cornea rarely suffers, but occasionaly with a loup the posterior epithelium has a brown or yellowish hue. The iris, most often affected, becomes green, yellowish red or reddish brown, either in its entirety or sector shaped. Impregnation of the ciliary muscle produces miosis or mydriasis. The lens may show a brown patch or even become absorbed. The vitreous is discolored and finally presents hemorrhages. The retina, usually affected by direct contact, shows large areas of brownish pigment. The prognosis in these cases is bad, as the iron retained in the eye produces further damage. The siderosis itself is incurable, even when the source is removed. Two cases alone have been reported by Cramer and Rogman where resolution occurred and vision was held. J. S. W.

The Prognosis of Chronic Glaucoma.

Lagrance, F., Bordeaux (Prognostic du glaucome chronique, *Arch. d'Ophtalmologie*, Vol. XXXIII, July, 1913, p. 401). There is so much of Lagrange's personality in this article that I have given it far more space than that generally accorded an abstract, as I believe my readers will welcome an extended rendition of the views of this master of the subject of glaucoma. Lagrange bases his observations on 284 cases seen within the past few years: he has observed them carefully, and in this article gives his conclusions, without taking account of the confused mass of information offered by the other authors.

The data for making a prognosis are obtained: 1. From the general condition; 2. From the objective examination of the eyes; 3. From the subjective examination of the vision; 4. From the results obtained in each case after reestablishing by surgical means the normal tension.

The general condition, and most especially the nervous system, should be thoroughly investigated. Neurosis plays a part in almost all cases of glaucoma, but preponderates in the minority of cases only. In this regard one might divide the glaucoma patients into three groups:

(a) Neuropathics, in whom the sympathetic vasomotor system is the seat of abnormal excitations, capable of giving rise to sudden congestions of the eye, as when the cheeks flush in anger, and thus of bringing on an instantaneous intraocular transudate which cannot escape through the excretory channels even when these are normal.

(b) Subjects of hypertension due to a pathologic general circulation, in whom all the vessels are sclerosed, including those of the eyes. These vessels, having lost their natural elasticity, do not permit the intraocular arterial blood to find its way easily out through the venous plexuses.

(c) Subjects in whom the vascular system is impaired and the nervous system defective.

We have, therefore, glaucoma of nervous, vascular, and both vascular and neuropathic origin.

Amongst these the most dangerous is the kind in which the nervous element prevails. Those cases which are due to sclerosis are troublesome, but those due to neurosis, as a rule hereditary, are richer in surprises and vexatious incidents. A glaucomatous patient with moderate hypertension will suddenly develop considerable tension under the influence of a sudden emotion, and present variations in tension without rhyme or reason. No doubt the glaucoma subject with changed vessels is the most subject to intraocular hemorrhage, but this accident is far less common than the acute glaucoma of the neuropath, and is less annoying, for the reason that the neurotic is generally a young person with good vision which may be lost, whereas the sclerotic subject has but a sorry rest of vision to lose in the terminal hemorrhage. Besides, the neurotic subject is the victim of internal trophic disorders, and in him the glaucoma comes on as a skin manifestation would; in him we have the most marked blanching of the papilla, the greatest degeneration of the optic nerve, and it is he who is most apt to withdraw from treatment. It is this class of patients who cause Lagrange the most care and worry.

The prognosis is bad in those cases of glaucoma in which sudden variations of tension occur. At times a patient will go to the operating room with a tension close to normal, and develop a strong tension at the sight of the knife. It is as though the eye were an erectile organ. Some eyes become hard even after the iridectomy while the toilet of the anterior

chamber is being performed; the eye seems to swell under the finger. Such eyes make one fearful of the future, and in them fistulization should be as free as possible. The abolition of the anterior chamber has long been looked upon as a malignant symptom; it is due to a serous effusion into the suprachoroid, a posterior lymphangitis, and it is in these cases that Heine's cyclodialysis is of value, even though it does harass the ciliary body, which should always be treated with the profoundest respect in every operation for glaucoma. Fistulization of the anterior chamber alone will not suffice; section of the ciliary tendon must be added, that is, the suprachoroid must communicate with the anterior chamber, a result which may be obtained by Lagrange's incision, although not in every case. Complete scleroiridectomy should be practiced, and a large piece of the iris excised, which may be done by pulling strongly on the iris before cutting. Even after well done sclerectomies the tension has remained high because the choroidal space had been left untouched. In a recent case the tension remained at 40 mm., in spite of a sclerectomy with peripheral buttonhole. The scar was reopened by pushing a knife in the direction of the ciliary tendon, which must have been cut, as the immediate result was the outflow of a jet of serous fluid and the reduction of the tension to 20 mm.

Suppressed accommodation is another annoying symptom in young glaucoma subjects, as it indicates a marked compression of the ciliary body. Lagrange believes, without being able to bring the proof, that this paresis is due to the presence of liquid between the sclera and the ciliary body, that is, to a lymphangitis of the suprachoroidal space.

The appearance of the papilla gives very useful hints as to the prognosis; discs that are much paler than the amount of excavation seems to warrant are danger signals. Patients with good vision may show a very white disc; this class of patients benefit much less than the other classes from normalizing. If paracentral scotomata are not already present, they are not slow in coming. In spite of the best normalization lacunes form in the optic nerve, as the trophic disturbances persist even after the pressure is removed, and against these the surgeon is powerless. The small caliber of the vessels is another thing worthy of attention; if this remains small after normalization, trophic disturbances are bound to appear.

Another sign of malignant glaucoma is the appearance of the conjunctiva around the cornea; in highly sclerotic subjects this is thin, very friable, and tears so easily that it is difficult to make the flap. Added to this is the smallness of the cornea.

Concerning the errors of refraction, Lagrange has found that the cases of severe glaucoma present fewer instances of astigmatism, contrary to the rule, than the others. It is a mistake, anyhow, to assume that astigmatism, contrary to the rule, is generally found in chronic glaucoma. In 284 eyes Lagraage found inverted astigmatism eighty-eight times, and, strange to say, it was these cases with inverted astigmatism that seemed to benefit most by operation.

Those patients who have long been bothered with clouding, and are loud in their lamentations, are the dangerous neuropaths spoken of above. Others are subject to the same annoyance, but seem to disregard it, whereas the neuropaths keep harping on the subject. One woman who made much of her rainbows and wanted her neighbors to admire them, developed an acute emotional glaucoma in an already sightless eye, after having sclerectomy with peripheral buttonhole performed on its fellow. Those who complain of hemeralopia and a great diminution of the light sense offer a relatively bad prognosis. Delorme has shown that the differential light sense is affected at the very beginning of glaucoma, whereas the absolute light sense is affected in advanced chronic glaucoma only, and the latter means trophic trouble in the optic nerve. If after normalization the absolute light sense is impaired, the prognosis is very bad.

The narrowing of the field of vision is also of great value in the making of the diagnosis: where it is inconsiderable the prognosis is relatively good. Contraction on the nasal side is an almost constant feature of chronic glaucoma, whether it be of long or short duration. Contraction of the lower field occurs twice as often as that of the upper field, according to Lagrange's statistics. The extreme narrowing of the fields, especially when it reaches the macula, makes the prognosis grave. Now that we know to operate without touching the iris, or, at the most, making a peripheral buttonhole, the prognosis is less somber than formerly, as the oldtime iridectomy was very apt to cause an immediate suppression of the macular function, an accident which was mentioned by Graefe and

de Wecker, and was observed by Lagrange three times while he was still doing iridectomies. The explanation of this accident is hard to give; it is not due to the sudden depletion of the eye, as it has never been noticed after a sclerectomy, in which the depletion is just as sudden. It must be that the trophic troubles increase rapidly after the resection of the iris, and that there is a sudden invasion of the macular bundle which had up to that time been respected by the lacunæ in the optic nerve.

Whereas the small paracentral scotoma of Bjerrum is an excellent diagnostic sign at the outset, the large scotomata threaten an invasion of the macular region, and the circular, or ring, scotoma is of the gravest import. Even a thorough normalization, while it may slow the process, cannot stop it, and the loss of the macular function is almost sure to ensue. Amongst those who were not benefited by an operation, 43 per cent showed marked scotomata; those who were much benefited showed a very small percentage. The color sense is very persistent in glaucoma subjects, and the diminution, especially its sudden loss, means a considerable aggravation of the condition.

Among the conditions influenced by normalization are, first of all, the normal status of the patient, who becomes more cheerful as soon as he is relieved of the fear and the pain of his attacks of hypertension. This puts a stop to the attacks which are of an emotional origin, but it does not do away with the basic cause of the glaucoma, so abnormal afflux will still occur occasionally, and the patient knows that his fistula will take care of that. In seventeen cases Lagrange noted the disappearance of the excavation of the optic disc, and these same seventeen cases were those in which operation produced the best results.

In one hundred and four cases which were kept under observation for more than a year, there was improvement of the field of vision, and that of very little extent, in but twenty-one cases; normalization, as a rule, leaves the condition of the field of vision in statu quo, as it is probably due to a degeneration of the nerve fibers, towards the correction of which surgery can do nothing.

Even the most perfect fistulization can do nothing towards removing the basic causes of glaucoma, and the trophic trou-

bles, once started, are bound to progress. Nevertheless, the outlook is, generally speaking, good; for, while hypertension is not everything in glaucoma, it is by far the most potent factor for evil in that disease. As a matter of fact, only about 5 per cent of those who have been well normalized continue to have progressive trophic trouble. After a successful operation glaucoma continues to be prognostically bad in neuropathics, in those who are badly sclerosed either locally or generally, and in those who, in spite of normal tension, continue to form lacunæ in the optic nerve. M. W. F.

Absence of Resorption in Traumatic Cataract.

Bourgeois, V., Reims (Absence de résorption de la cataracte traumatique, *Arch. d'Ophtalmologie*, Vol. XXXIII, July, 1913, p. 413), does not hold, with Toussaint and Cauvin, that expectant treatment is called for in simple traumatic cataract. Where there are complications, one should wait until the eye becomes quiet; but the sooner one removes the cataractous lens after this stage has been reached, the better. To determine whether the proper moment has arrived, he uses the test proposed by Becker in his Practical Guide for Determining the Compensation in Eye Accidents: "After cocainizing the eye the conjunctiva is seized with the fixation forceps close to the cornea. If the hemorrhage caused by this remains discrete and disappears rapidly, one may operate without danger. If a rose colored zone develops around the cornea, meaning ciliary injection, there is grave danger of an iritis following the operation." M. W. F.

Tetanus Following Ocular Injuries.

Vinsonneau, Angiers (Le teanos consecutif aux traumatismes orbito-oculaires, *Arch. d'Ophtalmologie*, Vol. XXXIII, July, 1913, p. 418), adds the twentieth case to those already described in literature. The patient was an alcoholic youth, aged eighteen years. Four days previous to his admission he had applied to the country doctor, who found a slight scratch of the conjunctiva caused by an instrument which the patient had used to pry off a piece of wood. No foreign body could be seen and vision was good. That same evening, however, the patient found that he could not see with that eye. Four days later he was sent to Vinsonneau, who determined a be-

ginning panophthalmitis. Enucleation under general anesthesia was done the next morning. Nothing of interest was seen in the wound on the following day, but the patient complained of a difficulty in eating and swallowing, which was attributed to the use of the mouth gag during the anesthesia, as no lingual or buccal lesion could be seen. Two days later the condition was the same. In the evening well marked tetanus had developed. The usual treatment was instituted, but intracranial injections through a trephine opening were not made because the patient was a minor and the case one of industrial accident. The patient died the next evening.

When earth has been introduced into an ocular wound one should always use the antitetanic serum, and Vinsonneau prefers the intravenous and intracerebral to the subcutaneous method. In fresh cases one should inject the serum into the region of the sphenoidal fissure and the optic foramen. Vinsonneau prefers the enucleation to exenteration, except in the case of young children, where enucleation would give rise to a hemiatrophy of the face. M. W. F.

ABSTRACTS FROM SPANISH OPHTHALMIC LITERATURE.

BY

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DENVER.

Optic Neuritis in the Course of Measles.

SANTOS FERNANDEZ, J., Havana (*Anales de Oftalmologia*, April, 1913). A girl of seven years lost her vision after the disappearance of the eruption of measles. The pupil was fairly well dilated, although no eye drops had been used. The optic disc was bluish white, and there was peripapillary edema. On account of the fairly frequent association of measles with diphtheria, the case was treated with Roux's antidiphtheric serum. In all, five injections of 20 cm. each were given at intervals of four days. Some improvement of vision was noticed by the patient the day after the first injection. She lived at some distance, so that she was not seen by the surgeon until four days after this injection, when she was able to count fingers and to go around alone. The vision steadily improved, reaching normal by four weeks after the first dose of serum. She was last seen five months after the occurrence of the amaurosis, when the vision was perfect. Notwithstanding the clinical improvement, however, the appearance of the optic disc remained as at first.

Two Cases of Melanosarcoma of the Lids.

MONTANO, E. F., Mexico (*Anales de Oftalmologia*, May, 1913). The first patient was a man of twenty-six years. According to the history, a small ulcerated black growth had been removed by an oculist twelve months after its first appearance as a black spot at the internal angle of the left eye. The growth recurred four months later, was again extirpated, and again reappeared after another three months, this time infiltrating the two lids. When seen by Montaño there was

a large swelling of the lids on the left side. Diagnosis of melanosarcoma originating in the lacrimal caruncle was made; and the lids were entirely removed, together with the eyeball. There had been no recurrence in the short period of two months elapsing since the operation. In the second patient, a woman of forty years, a small blackish tumor had appeared in the lower lid of the right eye four years previously, and had been removed, with the exception of a small crescentic area which had remained stationary for three years. Recent growth had been so rapid that closure of the lids was impossible.

Two Cases of Cyst in the Lacrimal Canaliculi.

Santos Fernandez, J., Havana (*Archivos de Oftalmologia*, May, 1913). A man of seventy-two years complained of trouble in the left eye which had lasted for twelve years. At the site of the upper punctum was a tumor the size of a pea. Further inquiry made it probable that a very minute cyst had existed at this point forty-three years previously. Turning the lid caused a drop of pus to flow from the punctum. The patency of the canaliculus and lacrimal canal was demonstrated by passing a probe, and also by the injection of fluid which reached the throat. The pressure, however, caused the exit of more pus, and at the end of the injection a further quantity of pus escaped, together with the contents of the cyst. On the following day no trace of the tumor remained, and at the same time the patient had become free from a preexisting inflammation of the conjunctiva.

The second case was that of a woman of thirty-nine years, whose left eye had been ailing for more than a year, and who for a month and a half had noticed a swelling in the lacrimal region, which suppurated. In this case also the lacrimal passages were permeable, although there was an escape of pus from the lower punctum. A cyst was evacuated, as in the first case; cure was equally rapid, and the patient became relieved of an inability for close work, of which she had previously complained.

Acne Rosacea and Keratitis.

De Caralt, Delmiro, Barcelona (*Archivos de Oftalmologia*, April, 1913). Following a rather lengthy consideration of the literature of the subject, and the description of fourteen

cases, the author presents the following conclusions: Rosacea keratitis is a local manifestation of angioneurotic rosacea, and is little studied rather than infrequent. The vasomotor disturbances, consisting in increase in caliber of the anterior ciliary vessels, and in hyperemia of the superficial conjunctival branches and of the terminal branches of the limbus, are always antecedent to and not simultaneous with the anatomic lesions of the cornea and conjunctiva. Characteristic features of the symptomatology are punctate subepithelial infiltrations, and a tendency to leave semitransparent but excavated scars. Although of apparent anatomic identity, rosacea keratitis, an endotoxic affection, is not to be confounded with socalled lymphatic or tuberculous keratoconjunctivitis. As regards treatment, iridectomy has no prophylactic value. Astringent and antiseptic medication aggravate the condition. The author has had satisfaction only from the use of lavage with isotonic solutions, with the symptomatic use of novocain and alipin. Each case requires special study, one patient needing fermented milk, eggs, or intestinal ferments and antiseptics; another iron and arsenic; and still another being benefited by opotherapy.

Sympathetic Ophthalmia Following Cataract Operation.

García Manselia, D. S., Madrid (*Archivos de Oftalmologia*, April, 1913). A cataract was extracted from the patient's left eye, without iridectomy, and using a conjunctival flap. The right eye was entirely well. Hernia of the iris occurred after three days, attributed to restlessness on the part of the patient. There was severe pain for twenty days. The hernia was excised, recurred, and after seven days was treated with ignicautery. The pain, however, persisted in the eye and in the periorbital regions. Forty-one days after the extraction, intense pain developed in the hitherto sound right eye, with progressive diminution of vision, which in four days had rendered the patient incapable of finding his way about. Examination fifty-two days after the extraction showed in the left eye the iris incarcerated; the pupil small and drawn up and in, and filled with whitish masses of exudate; pericorneal injection; and pain increased by pressure on the ciliary region. The vision of this eye was fingers at 20 cm. As regards the right eye, there were sharp pericorneal injection, abundant

lacrimation, intense pain, photophobia, and pupillary exudate. The vision of this eye was fingers at 25 cm. As regards syphilis, the history was negative, but the case was treated with mercurial inunctions, instillations of atropin, and hot compresses. In six days there was an improvement in the iritis of the right eye, and this eye was entirely well after another two weeks, without synechia or permanent disturbance of vision. Four months after the cataract extraction, iridocapsulotomy resulted in corrected vision of 2/3 in the left eye.

Intraocular Calculus Causing Sympathetic Ophthalmia.

Sal Lence (*Archivos de Oftalmologia*, June, 1913). The patient, a man of forty-five years, had lost the sight of his left eye thirty-four years earlier as the result of a blow. For four years this eye had been harder and more sensitive, and these symptoms had been accentuated for three months past. During the last few days the sound eye had been affected, the patient complaining of periorbital pains, diminution of visual acuity, and marked photophobia. There was ciliary injection, the cornea was dull, the aqueous cloudy, the iris discolored, and the pupil sluggish. Enucleation of the blind eye was followed by prompt improvement in the other eye, the vision of which rose in a few days from 1/3 to 1. The vitreous cavity of the enucleated eye was found to contain a "calculus" measuring 13x8 mm., and composed of calcium carbonate, calcium phosphate, magnesium phosphate, organic matter, and blood pigment.

The Mydriatic Action of Adrenalin in Man.

Marquez, M., Madrid (*Archivos de Oftalmologia*, June, 1913), traces the contrast between the action of cocain and of adrenalin. The former acts on the nonvascular muscular sympathetic nerve fibers of the eye; and the latter exclusively on the vasomotor sympathetic fibers. There is good reason to believe that the sympathetic fibers which go to the nonvascular ocular muscles are entirely distinct from those which innervate the vasomotor muscles. The former presumably enter through the long ciliary nerves which are derived from the nasal branch of the ophthalmic; the latter, with the long and short posterior ciliary arteries which penetrate the eyeball in the neighborhood of the optic nerve. Each set of fibers apparently has a distinct susceptibility to the action of a par-

ticular therapeutic agent. That the action of adrenalin when instilled in man is purely vascular appears probable, according to Marquez, from the facts that the mydriatic action is weak and inconstant, that it is slow to appear, and that it is more perceptible in cases of paralysis of the ocular sympathetic.

When adrenalin was first used it was thought to favor the absorption of the other collyria, atropin, cocain, etc. In reality, we are dealing with the action of synergic mydriatics which, when associated, and precisely because they produce their results by very different mechanisms, act much more energetically than would either one separately. So that where it is desired to produce intense mydriasis and neither substance is contraindicated, the maximum effect will be had by associating atropin (or one of its substitutes) with cocain (or an agent of the same group) and adrenalin or synthetic suprarenin.

Complete Ossification of the Vitreous Humor.

Urraca A. Reyero, Cesar, Burgos (*Archivos de Oftalmologia*, June, 1913). The patient was twenty-six years old, and twenty years earlier had completely lost the vision of the left eye, probably in consequence of corneal ulcer. There had been only slight disturbance in the blind eye during the intervening period, until a month back, when the eye had become sharply inflamed and so painful as to interfere with sleep. Examination showed anterior staphyloma, extensive deep ulceration of the cornea, hypopyon, and iritis. There were also intense photophobia and extreme hyperesthesia. The eye was enucleated and found to be atrophied and of stony hardness. The space normally occupied by the vitreous was filled with an imperfectly rounded body of rough surface and whitish color, weighing 2.3 gm. and measuring 2x1x1 cm. The lens was ossified. The ocular coats, not excepting the choroid, were found microscopically neither ossified nor calcified, but presented merely the changes characteristic of chronic inflammation. The central mass had the histologic structure of true bone. The possibility of ossification of the vitreous has been denied absolutely by Knapp, and confirmed by Virchow and Hyrtl. The bony tissue in this case was probably formed by ossification of exudate thrown into the vitreous from the uveal tract, and subsequently organized.

ABSTRACTS FROM ITALIAN OPHTHALMIC LITERATURE.

BY

J. Herbert Claiborne, M. D.,

New York.

On Making a Communication Between Lacrimal Duct and Nose.

Cirincione, Speciale (*R. Clinica oculistica di Roma*, May-June, 1913). The article deals with the history of the various methods of curing dacryocystitis and finally introduces the method which he himself has suggested, and which is a modification of that of Toti. The article is accompanied by numerous and excellent illustrations of the various steps of his operation, which he divides into four parts:

1. The incision into the skin and the exposure of the lacrimal sac by a curvilinear incision (which differs but little from the ordinary) to the inner side of the canthus; the first incision is made down to the periosteum, exposing the anterior lacrimal crest, so that the sac can be readily seen.

2. Complete removal of the sac, which he accomplished easily with the bayonet formed bistoury of Professor Cirincione.

3. Perforation of the nasal process of the superior maxillary bone, making an entrance into the nasal cavity.

4. The sutures in the integument.

He claims that this operation has been very successful and is easily performed, whereas that of Toti is long and complicated, and for this reason has discouraged many surgeons from attempting it. The method seems to be reasonable, and if it proves equally successful in the hands of others, should mark an epoch in the treatment of chronic dacryocystitis.

The Index of the Refracting Media of the Normal Human Eye.

Cirincione, Speciale (*R. Clinica oculistica di Roma*, 1913). The index of refraction of the ocular media in man at the temperature of the living gives a value different from that which

is found in the dead, and this is not only by reason of the difference of temperature, but by reason of the fact that the transparent humors of the eye are altered in their composition and their optic behavior in the dead. The aqueous and the vitreous, because they absorb the products of decomposition from the neighboring tissues, have, in cadavers, high indices. The cementing substance of the lamellæ of the crystalline is liquefied, and to this is due the discovery by several authors of the presence of an albuminous substance at the anterior pole within the capsular sac; while in the normal crystalline, the superficial strata are solidly adherent to the capsule.

The index of the aqueous of the normal eye is 133,325, that of the vitreous 133,312. These figures show that the index of the aqueous and that of the vitreous are identical in animals and man when the material is equally fresh, but not so in the cornea, which gives for man the value of 13,731. It is probable that this serves to compensate for the lesser refracting power of the human crystalline which, as well in the nucleus as in the cortical strata, has an index less than that of corresponding points in the crystalline of animals, while its anteroposterior diameter is shorter.

The index of the more superficial stratum of the crystalline (capsule with the subcortical superficial stratum) is in the adult 13,883, and in the infant 13,890; the immediately underlying strata gives respectively the value 14,011 and 13,959.

At the posterior pole the superficial cortical stratum and the deep stratum give 14,008 to 14,014; in the aged 13,894, and 13,960 in the infant.

The index of the aqueous is in the first 14,080; in the second 14,000.

The curve of the index for the human crystalline shows thus a behavior analogous to that of animals; but is proportionally lower, the difference lying between the cortical and smaller nuclear strata at corresponding distances between these points.

The variation in the value of the index in the different strata of the crystalline with age are in the human eye sufficiently important, in that they show sensible differences throughout the same strata between youth and adult age.

The index grows with the age, and with the growth of the

index the consistence of the crystalline increases, without, however, obtaining the resistance of that of animals, and it is for this reason that its lamellæ and its fibers are capable of being modified at a late age or by rupture of its zonular connections.

No marked difference exists in the value of the index of the cortical layers of the two poles of the human crystalline in repose and during strong spasm of accommodation. The albuminous substance, as "Heine" describes it, is not met with in eyes recently removed.

SOCIETY PROCEEDINGS.

BY

ARTHUR J. BEDELL, M. D.,

ALBANY.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Meeting of Monday, April 21, 1913. The President, Dr. Willis O. Nance, in the Chair.

A Case of Primary Sarcoma of the Cornea.

Dr. L. W. Dean: Three months before being seen, April 24, 1912, the patient, a woman, aged 63, noticed a brownish flat growth on the cornea of the right eye, which had increased somewhat in thickness. There was no pain, but vision failed rapidly. The tumor apparently grew from the anterior surface, was of light rust color, very vascular, 5 mm. in vertical and transverse diameters and the apex 2 mm. above the surface. It occupied the central portion of the upper half, extending a little below the median line, but having above 1 mm. of clear corneal tissue, traversed by numerous blood vessels. The tumor was enucleated April 26, 1912. Microscopically the tumor was found by Prof. Henry Albert to be a cellular mass of tissue, not covered by epithelium, but overlapped at the edges by the epithelium of the cornea. It was well defined from the corneal tissue, but there was nothing to suggest capsule formation. The corneal epithelium was absent beneath, but Bowman's membrane was intact except in the center, and the substantia propria at this point was slightly infiltrated by the tumor. The cells were large, round or oval, oat-shaped and some slightly spindle-shaped, with mitotic figures numerous, and a few cells containing finely granular yellowish pigment suggesting melanotic sarcoma. Blood vessels were numerous and were surrounded by small lymphocytes.

Collogen intercellular fibrils were shown by Van Gieson's and Mallory's stains; fibroglia fibrils were also present. Diagnosis, sarcoma, originating entirely from the cornea, probably from the superficial layers of the substantia propria.

Dr. Derrick T. Vail, Cincinnati, reported a case in which a diagnosis of melanosarcoma of the cornea had been made by the junior ophthalmologist in the Cincinnati Hospital, Dr. Wooley. Dr. Vail had diagnosed it as a soft fibroma. The anterior elastic membrane of the cornea was not invaded; it was a purely epithelial growth and seemed to spring from the usual site of a pterygium. It had extended entirely across the pupillary area and the pupil could only be seen by looking obliquely under the tumor mass, which was fungoid, dark in color and easily stripped from the cornea. It is now nine months since the tumor was removed and the cornea is perfectly clear, with no evidence of return and no scar.

Dr. J. E. Colburn reported a case in which he removed what was supposed to be a pterygium from the inner canthus. In a few months it had returned and covered an area three times its original size. It was removed again, and in about six months the patient had an irregular swastika-shaped tumor over five-sixths of the entire cornea. It was determined after its first removal that it was a melanosarcoma. It was removed with a white-hot electric needle or curette, going over the entire surface of the cornea and burning it quite deeply. Recovery was uneventful and prompt. It was removed ten years ago, and the patient, a physician, was seen a few weeks ago, when that eye gave the best vision and there was no scar on the cornea. The method was suggested by an operation in Dr. Greenleaf's clinic in New York.

Discussion.—Dr. C. H. Francis said the question to decide is whether the growth is malignant. From the morphologic appearance it is impossible to determine the origin of the cells. They are epithelial cells, smaller in type and simpler than the epithelial cells proliferating in carcinoma. Many of them show that they are not undergoing differentiation, and the question is as to their origin. Von Recklinghausen would say they are epithelial in origin, and Unna would pronounce it a nevus in the conjunctiva. He claims to have found that the outlying foci show connection with the surface epithelium, and, in opposition to von Recklinghausen's theory, most of these cells

are arranged vertically and not horizontally, as they would be if they rose from the lymphatics. Ribbert, on the other hand, claims they originate from the connective tissue cells. All these questions are important to determine in pigmented nevi that show proliferation. If we follow Unna, it is a carcinoma. If Ribbert's theory is right, they must be classed with the sarcomata. This case shows the connective tissue cells proliferating, but they are in the same horizontal meridian as the blood vessels and may have originated from the vessels. We know, too, that epibulbar carcinoma and sarcoma are both very vascular. Lebor and Parsons believe that when a nevus cell becomes malignant it is carcinoma. On the other hand, Fuchs says, without reservation, that if a nevus cell becomes malignant it always develops into a sarcoma.

Dr. Oliver Tydings referred to a case reported by him to the Mississippi Valley Medical Association in 1894 in a man 75 years old. He advised removal of the growth on the cornea. As he couldn't guarantee the integrity of the globe after removal, operation was refused. Three or four months afterward the patient came back with a large and painful ulcer, which was not very vascular. It was dissected out and sent to the Columbus Laboratory, where it was reported to be a melanosarcoma, not very vascular. He did not report that as a primary sarcoma of the cornea, a neoplasm which he believes is very rare. He had hunted up the literature and at that time could find no report of a case in this country. A few cases were reported by Parsons, all foreign, some questionable. It was reported by him as a sarcoma of the anterior segment of the globe. Fifty years before the man had got a wheat beard in the eye and had had a sore eye for a long time. There was one spot which Dr. Tydings did not succeed in removing. He believed the man had suffered a perforation of the cornea and iris prolapse and later this growth had started. The cornea was clear all around. Vision three years ago, five or six years after removal, was 20/20. There had been no recurrence.

Dr. L. W. Dean emphasized the fact that the tumor at its nearest point was separated 1 to 1.5 mm. from the sclerocorneal junction. It was removed a year ago. As Dr. Tydings has said, primary sarcoma of the cornea is exceedingly rare, and consequently Professor Albert was careful before making a definite report on the structure of the tumor.

Conical Cornea.

Dr. J. R. Hoffman reported a case of conical cornea complicated by ulcer in right cornea in a girl aged 15, who had had bulging of right cornea for several years. June 14, 1910, it began to be inflamed. Examination shows large conus of right cornea protruding between lids and a large deep ulcer of the apex of cone with Descemet's membrane presenting. Left cornea moderately conical. R. V., perception. L. V., 20/200 with no improvement with lenses. Right eye atropinized and ulcer cauterized with galvanocautery. Pressure bandage and atropin instilled. June 29, 1910, ulcer still being unhealed, used galvanocautery again. July 14, 1910, ulcer healed, cornea markedly flatter. Ordered dionin, 5 per cent., twice daily, continued atropin, leaving off bandage. Continued dionin in increasing strength until patient was using 20 per cent ointment at home every other day and powder in the clinic once a week. Atropin 1 per cent until September 13, 1910, when inflammatory signs and tenderness had disappeared. Vision at that date was: R., 20/200; L., 20/200; no improvement with lenses. Opacity of cornea steadily decreased from at least 8 mm. in diameter to present size, till about a year ago, since when it has remained stationary. At present time, R. V., 20/200; L. V., 20/200; no improvement.

Discussion.—Dr. Oliver Tydings, referring to conical cornea, reported the case of a patient with injury which under the slightest provocation would rupture the cornea. In that case he tried an elastic bandage, the patient at first wearing it, with a small pad underneath, all the time, and then for about eighteen months at night only. The condition had existed for five years and constantly recurred. Several years after this treatment there had been no recurrence of rupture of the cornea. He certainly would resort to that treatment before adopting anything more heroic.

Dislocation of the Lens.

Dr. Lloyd reported a case of dislocation of the lens and described his method of getting the lens into the anterior chamber, which was interesting. The lens had been dislocated and had gone back into the vitreous. He had the patient in the hospital on his face, with the hope that the lens

would come into the anterior chamber, without effect. He then had the patient make a number of forward quick bowing movements, which brought the lens into the anterior chamber, from which it was extracted.

A case of vernal ophthalmia in a young man he had hoped to have the members see. He was 30 years of age and had had the trouble for several years, beginning at Los Angeles, and while he lived at San Francisco, New York, Boston and Philadelphia and after he came to Chicago, the trouble finally becoming constant. There was no corneal involvement, but it presented a typical appearance of vernal catarrh of the lid. He wanted some hints as to the treatment.

Ectropion of Lower Lid.

Dr. Frank Brawley reported for Dr. Frank Allport a case operated on by the latter for extensive ectropion of the lower lid. The operation consisted in taking a long flap from the temporal region, leaving it attached by a pedicle, and swinging it to the lower lid, which had been prepared beforehand. An incision was made just below the lid margin, the lid raised and the flap sewed into this open space left by the incision. On one side the tip of the flap sloughed and the result was not quite as perfect as on the other side. The man was suffering from a deeply injected conjunctiva from the exposure, and corneal ulcers. He is now able to close the eye, and Dr. Allport proposes to raise the lid still further and do a blepharoplasty on the left eye, at the outer canthus, where the closure is not complete.

Corneal Microscope.

Dr. H. S. Gradle exhibited a corneal microscope which had been constructed from the tubes of an ordinary ophthalmometer. The ophthalmometer is essentially a telescope or microscope with a pair of birefringent prisms. The conical tube shown contains the prism and the objective. This is pulled out and another tube without the prisms is substituted for it. The ordinary high power loupe is rather insufficient to examine the cornea and the anterior aspects of the eye because of insufficient illumination. With the modification of the apparatus as described, all that is necessary is to add a lighting apparatus. With an eight candlepower light

from an ordinary circuit, anything from direct illumination to complete oblique illumination can be obtained. The instrument is a diagnostic instrument. One cannot work around the shield of the ophthalmometer, but the instrument can be used for the diagnosis of conditions of the cornea, anything in the anterior chamber, iris, conjunctivā, sclera or anterior surface of the lens. This will give about ten diameters of magnification. An attempt is being made to increase the magnification, but it is not satisfactory yet. It can be attached to any ophthalmometer based on Schiötz's method.

Indications and Contraindications for Vaccine Therapy.

Dr. Adolph Gehrmann read by invitation a paper on the "Indications and Contraindications for Vaccine Therapy." A vaccine is an attenuated virus that will produce a mild infection, but enough to protect. It may be attenuated in many ways, but it remains a virus as long as it is alive. The preparations usually used are not true vaccines, but constitute a toxin therapy that is of most variable character. The principle involved is the stimulation of natural resistant activities by which invading bacteria are overcome. Two possible conditions obtain—where the parasite is slowly invading and immunity is not being developed fast enough to stop its advance, and second, where the tissues have become accustomed to the presence of the parasite and are only moderately disturbed, not sufficiently to discharge the parasite. Vaccine therapy differs from vaccination, in that it is apparently adding to the infection. Vaccination is of no value after infection is begun, but vaccine therapy is useful where the infection with a mild parasite has become subacute, where the infection is on the surface and has not become completely discharged, and where the infection recurs because of a short immunization period. Toleration may be established, in which state the host is not sufficiently stimulated to dispose of the parasite. Mixed infection usually ensues, with final recovery owing to overgrowth of one species, until finally saprophytes remain, to be finally discharged. In surface infection absorption of toxins is slow and antigens do not reach the circulation, and sufficient resistance is not stimulated until vaccines are given. Short immunity is due to low opsonic index, which may rise, but falls again with recurrence. Shotgun methods

should not be used, but a bacteriologic diagnosis should be made so that the system may not have to destroy unnecessary toxins. To an extent the procedure is specific, but not absolutely so. Cases should be selected by the rate of advance of the infection, the degree of reaction to the infection and the stage to which it has advanced. Applied early in slowly increasing invasions, rapid absorption of the attack may be induced. The application is indicated when the patient is not reacting against the infection. In recurring infections the short immunity period may be extended by vaccines, as in general mixed mucous membrane infections of the respiratory passages. The contraindications to vaccine therapy are: rapid fulminating infections, confined infections, whether the patient is reacting or not, which should be drained; old chronic infections with a mechanical feature interfering with recovery; cases that have been absorbing excessive toxins; cases in which there is an underlying nutrition defect, which in itself prevents formation of immune bodies. If there is not at least a moderate reaction after injection the vaccine is not right, and if there is not early evidence of recovery, some other treatment should be used. In principle, it may be said, the nearer the natural conditions of virulence are represented in a vaccine the more certainly will the normal defense be stimulated.

A Resume of Personal Experience With Vaccine.

Dr. William A. Mann: Based on two years' experience with private cases, Dr. Mann had previously made two reports with vaccines in phlyctenular keratitis, corneal ulcers, nonspecific iritis, choroiditis and uveitis and penetrating wounds of the eyeball. His conclusions then were that a mixed vaccine of staphylococcus and streptococcus was of decided benefit, and at this time, three years later, feels still more confidence in such vaccines in the diseases mentioned. In the diseases named, due to endogenous infection, it was hardly feasible to make an autogenous vaccine, but in some the offending germ could be obtained by paracentesis. Therefore the mixed vaccines were mostly used. In phlyctenular conjunctivitis improvement was rapid and there was seldom a return. In phlyctenular keratitis healing of the ulcers was hastened, but the most decided results were obtained in the chronic type. One injection was usually sufficient, with a

second to assist the cure. In one case of tubercular type, improvement was not rapid nor permanent, but improvement was noted always after vaccine. Tuberculin in addition was advised. In episcleritis the inflammatory signs disappeared after one or two injections. In nonspecific iritis, if given in the early stage, pain is increased for twelve to eighteen hours, when improvement begins and shortening or abortion of the disease occurs. Choroiditis was treated in only a few instances. There was improvement in all cases of uveitis except one, which did not return after the first injection. Vitreous opacities and deposits on Descemet's membrane are not much influenced. They are due to endogenous infection from a focus elsewhere in the body, as the intestines, nasal sinuses, mouth, vagina, gall bladder, etc. According to S. Mayou, staphylococcus is responsible for most cases. In cases in which tuberculosis was present improvement was not so rapid. The vaccine has been used as a prophylactic in traumatic operative cases, cataract in rheumatic patients and iritis. It does not always prevent cyclitis. The adult dose is 30 million streptococcus, and 100 million each of staphylococcus albus and aureus. A smaller dose for women and a proportionate dose for children, given at three to five-day intervals, gradually increased. The local reaction never goes on to suppuration, though it may be severe.

The Diagnostic Reactions in the Diagnosis of Gonorrheal Diseases of the Eye.

Dr. Ernest E. Irons said he wished to discuss under this title the reactions which we at present have which are of value in seeking a diagnosis of gonorrheal infections of the eye, rather than to advocate any particular reaction. He understood from ophthalmologists that there are a large number of lesions of the eye which up to recent years have been extremely obscure in their etiology, aside from the conjunctivitis of gonorrheal origin, in which there is little doubt of the diagnosis, such as certain cases of metastatic conjunctivitis or ophthalmia; cases of iritis which have been ascribed to rheumatic causes, and it seems probable that a certain proportion of these are due to bacterial infection of metastatic or embolic source. There is also a rather similar nomenclature in dealing with the joints, and some of

their features are similar to those of some of the obscure cases of iritis. Some years ago many arthritides in which the etiology was not definitely made out, which went on to more or less destruction of the joints, were classed as arthritis deformans, and it was assumed that nothing further could be done aside from general supportive treatment, diet, etc. Now gradually that large class of arthritis is being cut down by taking out here and there cases which are believed to be of infectious origin and that where is some focal infection responsible for the invasion of the avascular structures such as the serous membranes of the joints, and many of these are gonococcic, and likewise many cases of obscure iritis have been pretty conclusively proved to be of gonococcal origin. And here the question is whether they are of toxic origin or of metastatic origin. The same question has been raised with relation to the joints, and the more the question is studied the more we are convinced that they are of metastatic origin. In a case, for instance, in which iritis and arthritis have developed within a short space of time, there is no reason why we should ascribe a toxic pathology to the iritis and a metastatic pathology to the arthritis. It is frequently possible to isolate the gonococcus from the joints or from the circulating blood. So that while Dr. Irons had no personal experience in the study of these conditions in the eye, he felt that we should not assume a different pathology for the eye than for the joints. Therefore, for purposes of discussion, we may say that a gonococcal infection of the eye means that there has been a more or less general infection of the system. There may be no other evidence than possibly the joint and a slight fever; nevertheless the infection may be assumed to be demonstrated.

This then raises the basis for the utilization of certain immunologic reactions which have been developed in recent years for the diagnosis of gonococcal infection. As in tuberculous infections, we have a general reaction which can be elicited by the introduction of comparatively large doses of toxic material from gonococcal cultures. These give rise to malaise, headache and a certain local reaction at the site of injection, together with a focal reaction in the affected part. Such reactions are not constant in gonococcus infections, but occur with sufficient frequency to be of some value in diagnosis. Then there is the local subcutaneous reaction which may

be obtained by a smaller dose subcutaneously. A small dose in a normal individual will produce little or no reaction; in an infected individual a more extensive reaction. This line of diagnostic work has been followed out pretty carefully in the German clinics in the pelvic affections of women and has been found to be of considerable value as confirmed by operation. Then there is the cutaneous reaction which can be demonstrated as in tuberculosis after the method of von Pirquet. While there are certain disadvantages which rather decrease the value of this method as a single diagnostic agent, still there are certain advantages in the study of the patient by the cutaneous reaction in the use of glycerin cultures of the gonococcus, and by repeated tests we can determine that the immunity curve is not constant but goes up and down, and that the exacerbations of joint lesions and the temperature are coincident or follow shortly after a period of low cutaneous reactivity. The third method by which we may obtain diagnostic information in septic cases is by complement fixation, which during the last two or three years has been used with rather satisfying results. The complement fixation test uses the hemolytic system reaction similar to the Wassermann reaction test. In place of the syphilitic antigen from the liver or extract of guinea pig heart as the antigen, there is substituted a gonococcal extract, and by performing the reaction with care fairly reliable results can be obtained. A fourth method by which we can identify rather obscure cases of gonococcal infection is by the cultural method of the various secretions, particularly those of the prostate. Although it is rather not the rule in urethral infections, the prostate may remain infected for a long time, and certain metastatic manifestations in the joints are merely expressions of metastasis of the organisms passed into the blood stream and lodged in certain vulnerable spots. So that in cases in which the etiologic factor is not evident we may apply these four tests and in a certain proportion obtain positive results in cases due to gonococcal infection.

Discussion.—Dr. A. Gehrmann, in closing the discussion, said in reply to the point raised by Dr. Mann as to the irritation caused by the injection, that he had not found carbolic acid in small doses particularly irritating. He had used many

injections on himself in throat infections, and there was no irritation that he could attribute to the vaccine. Dr. Mann said he referred to the smarting or burning after the injection, not to irritation. Dr. Gehrmann thought that after a few hours there would be a smarting, but that he would suggest diluting the vaccine just before use with salt solution. Carbolic acid and tricresol are the things usually used as preservatives.

Dr. Wm. A. Mann said he was interested in Dr. Irons' statement that the gonococcus might be the cause of recurrent iritis cases. He had had cases that he thought were, until in a number of them the eye reddened up with deep ciliary congestion, which subsided nicely under atropin, and two or three days later the other eye would do the same thing. In such cases he had used a mixture of gonococcus and staphylococcus, but he thought the improvement occurred before the vaccine had any effect, although it might have had effect later.

Dr. E. E. Irons said he wanted to second what Dr. Gehrmann had said about the unscientific and irrational methods of treating infections by certain toxic products which are used very largely at present. We can produce the same reactions and the same symptoms of toxemia in animals by the injection of putrid matter from broth containing any sort of organism, and the mere fact that a febrile reaction, with perhaps nausea and vomiting, is obtained does not argue for the specificity or effectiveness of an agent.

Dr. Wm. A. Mann asked Dr. Gehrmann whether he had used these vaccines by spray for the local effect. Dr. Gehrmann said he had seen reports of their use in that manner but did not know anything about such use.

A Study of Some Forms of Congenital Cataract, With Special Reference to Their Clinical Significance.

Dr. Derrick T. Vail traced the embryonic development of the lens vesicle from the ectodermic layer and its subsequent inclosure by the mesoderm before and behind which goes to form the structures in front of the lens and the vitreous behind; the formation of the lens nucleus from the cells springing from the posterior layer of the lens vesicle, and the cortical fibers formed from the cells lining the anterior capsule.

He said that all forms of congenital cataract are due to some hitch or break in the orderly sequence of the process of normal lens building. Congenital aphakia is rare and is due to a failure of down-growth of the surface epiblast. Congenital nuclear cataract is due, according to Collins and Mayou, to delayed closure of the anterior wall of the lens vesicle. Congenital fibrous tissue cataract is due to failure of the posterior capsule to form in whole or in part. Congenital disc shaped cataract is characterized by a glittering white, round or star-shaped spot in the pupil space, occupying the anterior substance of the lens as a form of anterior polar cataract. The eye is usually strabismic and markedly nystagmic, of the slow rotary type, and is amblyopic, mostly from microphthalmus. Prognosis as to vision after removal is not good. The white spot can be picked out, leaving a lens like a ring doughnut, the ring part being clear. A needling operation is contraindicated, but Smith removes the lens with an iris forceps after an iridectomy. An iridectomy, while not as good as total extraction, is recommended in preference in the case of very young children. Congenital Morgagnian cataract is found in a small eyeball, with voluntary nystagmus, disassociated vagrant strabismus, a uniform milky, opaque pupil, the cataract being flush with the plane of the iris, presenting a dirty-white or yellowish-white appearance, with vision reduced to light perception. If such a lens is pricked with a needle a milky fluid floods the anterior chamber. It is due to absence of the formation of cortical fibers from the anterior capsule and a disintegration of the cells of the lens vesicle. Axial fusiform cataract is due to displacement of the lens nucleus forward or backward in the embryo. The triradiate form of congenital cataract, usually just in front of or behind the nucleus, indicates the original suture lines of the early cortex fibers. Originally these lines are near the periphery of the lens cortex, but as time passes they are gradually forced to move toward the nucleus by the later formed cortex fibers growing from the lining cells of the anterior capsule. The coralliform axial cataract is a congenital form presenting in the axis of the lens structure knotted or irregular bosses not unlike coral formation, and are difficult to explain embryologically. All forms of congenital cataract are apt to be associated with microphthalmus and congenitally deficient retina

due to lack of differentiation of the macula lutea. If there is any clear space in the pupil area so as to permit the retina to functionate, operation may be deferred and later an iridectomy may be done on the side best suited, as indicated by the strabismus. A rotary voluntary nystagmus also indicates an iridectomy. If there is quiet, steady fixation in the effort to see, an iridectomy will not improve vision, as the same axis of fixation will be used by the child. Needling in the above forms of cataract with glittering opacities would be contraindicated because they are insoluble, permanent and irritating when liberated from their natural position, and also because microphthalmus, almost always being present, infantile glaucoma may occur, owing to imperfect formation of the spaces of Fontana. Congenital punctate cataract is characterized by round opaque white dots located in the cortex fibers, usually in the equatorial region. The eye is full sized and vision is normal, and they have no pathologic significance. They may be due to granular degeneration of cortex lens fibers. Zonular cataract may or may not be congenital. They are believed by Collins and Mayou to be due to some general disturbance of nutrition, as they are bilateral and frequently associated with fits in infancy, rickets and defective condition of the teeth. It is not rare and is easily diagnosed by the aid of the red reflex through the dilated pupil and focal illumination, aided by the binocular loupe of Berger or Zeiss. The nucleus and cortex are clear, but surrounding the nucleus is a zone of opacification due to the presence of tiny vacuoles in the lamellar structure of the cortex surrounding the nucleus. Such cataracts lend themselves to the needling operation with the best prospects. Iridectomy need not be performed, and the soft cataract substance formed may be evacuated through a small keratome incision. Needling in the other forms of congenital cataract is not good treatment.

Discussion.—Dr. H. S. Cradle said that unquestionably some of these symptoms of congenital cataract must be of toxic origin. This was recently shown by the work of Pagenstecher and Axenfeld, who fed rabbits with betanaphtholin and 90 per cent of the offspring showed congenital cataract followed by opacity of the capsule. This, of course, must be of toxic origin. This was also associated with glaucomatous conditions of the lens and the iris particularly. The condition of the lens

was explained by an endarteritis of the hyaloid artery and the long artery coming in over the optic pit. They come together before they should and form a band through which the lens cannot develop. A notch is cut out of the lens, and these things are associated with the various forms of congenital cataract which Dr. Vail has spoken of.

Dr. W. A. Fisher said that we had all been taught that Col. Smith always does an iridectomy with cataract extraction, and Dr. Vail has told us that he operates as early as twelve months by the intracapsular method. He would like to have him tell what treatment Col. Smith uses in the simple extraction in these early cases.

Dr. Derrick T. Vail said, in closing, that in the paper he had stated that the iridectomy operation could be done as early as one year, but he did not say that the lens was removed as early as one year. He had seen Col. Smith remove them as early as they came, and he had seen them as young as three or four years. He makes a small incision in the cornea with the Graefe knife, not quite as small as he could make with the keratome. These lenses are all rudimentary. The rough sketches by which he illustrated his paper indicated that they are of full size, but they are exceedingly small, not much more than a small calcified membrane, and they do not require a very large discission, and the forceps are forced down into the eye, and the lens is grasped and pulled out. He simply ties them up with a figure-of-8 bandage, one turn for each eye, and the child is carried off to be taken care of by the parents. In regard to the naphtholin tests spoken of by Dr. Gradle, it is well known that naphtholin will produce cataract in the adult human as well as in animlas, similar to the cataract produced in hookworm anemia, of a milky character, somewhat like those that form in rabbits, as described by Dr. Gradle.

Meeting of May 19, 1913. Dr. Willis O. Nance presiding.

Glaucoma.

Dr. Thomas Faith showed a recently trephined case of glaucoma. The patient was presented several months ago because of his youth. Absolute glaucoma with tension of 72 in one eye. Treatment had no effect—even miotics or sub-

conjunctival injection of saturated sodium solution. In the other eye tension was kept normal with eserin, .25. There was ectasia of the sclera in the absolute glaucoma eye, so fearing a rupture of the globe he insisted on doing scleral trephining four weeks ago. In the next two weeks tension went down until it was 34, then it rose again to 42. There had been no pain. The patient was very nervous, tension was minus and he did not know the nature of the change. Although the trephine hole had opened again and the eye looked good, tension was extremely low. The operation, simple compared with an iridectomy, was done to the temporal side with a Gradle trephine.

Discussion.—Dr. William A. Fischer quoted Dr. Gradle as saying that there was an iridocyclitis in the case. He thought trephining far superior to iridectomy, and although he only had done a few of these operations, the results were equal to, if not better than, those following iridectomy.

Dr. Harry Gradle said if one did the trephining far enough forward it might suffice without an iridectomy, but, as a rule, it was impossible to get into the cornea, and consequently the pressure of the aqueous in the posterior part was sufficient to jam the iris into the filtration angle, closing the scleral wound.

Dr. Faith could not understand why Dr. Gradle thought iridocyclitis was present, as there was no deposit and the lens was clear. There must have been a leak, because the anterior chamber was shallower today than it was several days ago. The discoloration of the iris had been present since the operation was done, the result of bleeding in the anterior chamber. In this case he took a piece of the iris, when tension went down immediately. After healing had apparently taken place and the anterior chamber reformed, tension was 46 or 48, but continued to lessen until now it is 28.

Involvement of the Posterior Group of Ethmoid Cells.

Dr. George Suker presented a young man who some twenty years ago had been struck a violent blow on the right side of the forehead. For several months prior to January he had what appeared to be a cystic protuberance in the outer angle of the right orbit in the region of the lacrimal gland. Palpation give the impression of fluid; presenting under the brow. He did not see the necessity of going any further than making

a tentative diagnosis of a small dermoid, because the patient had had a socalled dermoid tumor removed from his spine some years ago. He made a small section which was followed by a yellowish fluid on puncturing the little sac. He dissected the crest of the sac for microscopic examination. Pressure and curettage showed a mass like gray matter; the probe went in two and a half inches and moved in all directions. He felt somewhat timid about going further and proceeded to close the wound, left a drain in position, and the wound continued to discharge. The eyeball projects forward and is a little lower, but the displacement is not one-tenth as much as when first seen. Further operation was necessary because the discharge continued. X-ray pictures showed on the right side an oyster-shaped affair, apparently in connection with the frontal sinus. Under general anesthesia he started his incision at the bridge of the nose, cutting through the brow above the superciliary ridge. Trephining he found the mass which he had apparently curetted at the primary operation. Not knowing the nature of it, he continued dissecting and curetting until finally the mass which he exhibited was removed. He had to remove a part of the frontal bone and went as far back as the lesser wing of the sphenoid. The roof of the orbit was pressed up and back, and the whole found filled with an undetermined mass, not fat. It came off in layers, although the periosteum itself was not involved, so that it was very difficult to remove the entire mass. There was no bleeding, although the orbital contents were pressed upon by this mass. There was a moderate choked disc in that eye which disappeared forty-eight hours after operation. Vision 20/20, the same as the other eye. No diplopia before or after the operation. The pupil is somewhat smaller and the palpebral aperture narrower. The ethmoids were drained through the nose with a large cigarette drain. A large area of dura was exposed above. The skin healed, but the discharge in which pneumococci were found continued for a long time. Finally two injections of bismuth paste stopped the drainage. There was a question as to the nature and origin of the mass. He thought it might have been a diploeic hemorrhage following an injury, as there was no roof to the orbit. He removed one layer that pressed upon the superior rectus muscle and went back to the lesser wing of the sphenoid; the mass, which was

about the size of a hen's egg, was brittle, but came out in layers. It did not dissolve in ether or take the Soudan stain, and showed no morphologic cellular elements under the microscope. The patient had no pain or elevation of temperature and was in good condition. The X-ray plates suggested connection with the frontal sinus with thin posterior plate, but such was not found.

Discussion.—Dr. B. F. Andrews said he had a skull showing displaced posterior ethmoid cells, and he considered Dr. Suker's case to be one of that kind.

Further Report on Parinaud's Conjunctivitis.

Dr. George F. Keiper, of Lafayette, Indiana, referred to his previous publication on this subject, and spoke of two new cases. Microscopic examination had been made, showing in serial sections the presence of fungus filaments resembling those found in mycosis of the tonsil, the leptothrix, which might be the cause of the condition. No characteristic bacteria found. All cases had recovered without material damage to vision. Authors were agreed that it took from two to six months to effect a cure. His three cases recovered in five weeks with no loss of vision.

Photographs were shown exhibiting the peculiar glandular swelling of the face and neck, together with the swollen eyelids, the granulation upon the everted eeylids, and in one case marked conjunctivitis, chemosis.

Discussion.—Dr. Harry Gradle referred to Verhoeff's twelve cases of Parinaud's disease reported in the American Academy of Ophthalmology proceedings. In eleven of the twelve Verhoeff isolated the leptothrix buccalis, and so coincides with Dr. Keiper in believing the picture one of simple mycosis of the tonsil.

Dr. Thomas Faith stated Dr. Lamont and he saw a railroad car repairer with enlargement of the preauricular and cervical glands on both sides and a temperature of 100.° Dr. Brown Pusey examined the tissue and conjunctival secretions, but nothing pathognomonic was present. Pieces of the conjunctiva were transplanted in the anterior chamber of the rabbit's eye and under the conjunctiva with no growth. The piece in the anterior chamber caused no iritis, the conjunctival one was absorbed. As there was no evidence of tuberculosis in the rabbit, it was considered Parinaud's conjunctivitis.

Infection Following the Extraction of Cataract.

Dr. H. W. Woodruff, Joliet, reported a cataract in a farmer with blood pressure of 160, negative urine and good physical condition, although emotional. Right eye vision = 6/15, beginning cataract; left vision, fingers at five feet. A smear examination from the conjunctival sac was negative. A combined operation after bromide of soda, April 1, 1913. The conjunctiva, lids and lacrimal sac were free from signs of inflammation. The patient squeezed his lids during the incision without harm. Iridectomy and lens extraction without difficulty. On the third day after the operation, following some discomfort, there was a hypopyon and white line along the corneal incision. A solution of cyanid of mercury with four minims of 4 per cent solution of cocain was injected deep into the outer cul-de-sac. Xerosis bacillus was found, the wound cauterized with tincture of iodin and another injection given, followed by the moist hot applications for one hour to relieve the pain. The next morning no hypopyon present. Two weeks after the operation he left hospital, and now, one and a half months after the operation, his eye is still somewhat red with capsule in the pupillary area and vision of 6/20 with + 8.50 ⊂ + 80° axis 175 degrees.

Discussion.—Dr. Meyer Lebensohn has used cyanid of mercury injections in several cases with marked benefit.

Dr. Harry Gradle did not agree with Dr. Woodruff's paper, believing all infection can be absolutely prevented by taking proper precautions before operation. He advised a fluid culture to determine the sterility of the conjunctival sac.

Dr. Woodruff, in closing, was certain he had saved eyes by this method and advised cyanid instead of salt.

Dr. Suker asked how strong a solution was used, to which Dr. Woodruff replied, a solution of 1/1000.

Dr. Suker asked whethere was much reaction, to which Dr. Woodruff replied there was.

Dr. A. H. Andrews read a paper on "Malingering."

Wesley Hamilton Peck,
Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of March 15, 1913. Dr. D. A. Strickler presiding.

Herpetic Ulcer of Cornea.

Dr. W. C. Bane presented a case of corneal ulcer which had started as a small bleb. It had cleared after curettement, but relapsed so that the ulcer is now a little broader than a week ago, with much pain, profuse lacrimation, but no discharge. The patient had had dionin locally and calomel dusted on the ulcer. Dr. Bane considered it herpetic keratitis, although there were no lesions on the lids.

Discussion.—Dr. Black thought that the ulcer was not herpetic in the usual sense of the word, but should be regarded as a constitutional ulcer.

Dr. Jackson suggested touching the edges of the ulcer with pure nitric acid.

Dr. Coover would fill up the eye with iodoform ointment.

Dr. Sedwick favored using holocain at short intervals. It relieved the pain and had a slight antiseptic action.

Unusual Case of Entropion From Trachoma.

Dr. D. H. Coover presented a boy of ten years with extreme entropion. Lower lids were turned in, the lashes appearing as a series of vertical parallel lines on the lower part of a vascular cornea. The father stated that the boy had had very bad eyes before he was two years old and that the lids had been turned in ever since. What would be the best procedure to turn the lids out?

Discussion.—Dr. Black advised dividing the fibers of the orbicularis muscle in the lower lid.

Dr. Matson stated that he had sandpapered the upper lids for the trachoma three years ago, and at that time the general anesthetic had not relaxed the entropion.

Dr. Jackson would use the galvanocautery point, drawing the skin well down, making three or four punctures and going deeply into the subcutaneous tissues so as to produce firm adhesion.

Optic Atrophy With Tabes.

Dr. C. E. Walker presented a patient who had rapidly lost the sight of both eyes. The optic discs were paper white. The man was believed to have had syphilis. His knee jerks were absent and one leg was partly paralyzed. Could anything be done for the case?

Discussion.—Those present did not think his eyes could be benefited.

Dr. Sedwick had had a case in which the patient thought the vision improved after salvarsan, but he did not share the patient's opinion.

Traumatic Rupture of Choroid.

Dr. H. Aufemwasser presented a young man whose left eye had been struck by a toy arrow in boyhood. There was a horizontal rupture of the choroid, extending from either side of the disc to the extreme periphery of the fundus.

Discussion.—Dr. Jackson stated that it was the first case he had seen where the rupture was not concentric with the disc.

Dr. Black recalled a case in which the rupture was concentric with the macula and not with the disc.

Dr. Crisp had invited a case of horizontal rupture to attend the meeting, but the patient was not present. The line of rupture was absolutely horizontal, running across the extreme lower edge of the disc, out four or five disc diameters, to both the nasal and temporal sides, with a second line of choroidal disturbance above, less extensive and less regular, having several pigment deposits, but showing no complete atrophy. The eye had been struck by a frozen clod ten years earlier.

Anterior Scleral Trephining for Glaucoma.

Dr. Edward Jackson presented a woman of forty-four years who had developed glaucoma in both eyes. Her last attack persisted a month, and her very severe pain had only been partly relieved by eserin. On her first visit to the office the tension of her right eye (Gradle-Schiötz) was 74 mm. of Hg. Both pupils were large, fixed and somewhat irregular. The patient had about 3.5 D. of hyperopia, but had worn no correction. Ten days before the meeting Dr. Jackson had done anterior scleral trephining by Elliot's method on the right

eye. The tension of the eye was now practically normal and the patient was almost free from pain. An iridectomy had been combined with the trephining, but the part of the pupil not affected by the iridectomy was now smaller than it had been ever under eserin. The trephine hole was covered by the unsutured flap.

Discussion.—Dr. Black reported a recent trephining where the flap held in excellent position without a suture.

Dr. Coover objected to a sliding flap because it adhered to the cornea for a long time after the operation.

Bilateral Posterior Polar Cataract.

Dr. H. R. Stilwill presented a woman of thirty-six years, with posterior polar lens opacity in each eye, vision being 20/30 in each; also a large opacity to the outer side of the left lens. The left eye was slightly protruded. The right pupil had been permanently dilated for four years with a small vitreous opacity.

Discussion.—Dr. Black thought that the opacities which were back of the lens and also the vitreous opacity were in the nature of hyaloid remains.

Steel in Orbit After Penetrating Eye.

Dr. E. E. McKeown presented a young man who four weeks before had received a penetrating injury of the right eye, a piece of steel entering to the outer side of the cornea. Diagnostic use of the magnet had produced pain, but had not brought the foreign body to the surface. X-ray examination subsequently showed the fragment to be lodged 32 mm. from the anterior surface of the cornea and 9 mm. to the nasal side of the median line of the eye. Dr. Walker had suggested the use of potassium iodid in increasing doses, mercury inunctions and Turkish baths three times a week. The patient now had 20/30 vision in this eye, as compared with light perception at the first consultation. There were vitreous opacities, but the presumable wound of exit could be made out several disc diameters to the nasal side of the optic disc.

Discussion.—Dr. Black described a case of injury by dynamite caps, one eye having been completely lost and a cataractous lens extracted from the other. This eye got very good vision, and with the ophthalmoscope the point of exit of the

foreign body could be clearly made out in the macula. After fifteen years the patient suddenly developed a large retinal detachment.

Dr. Jackson would like to watch the case a while longer before finally deciding that the foreign body was not embedded in the sclera. There was a peculiar glistening appearance at the presumable point of exit, suggesting the presence of a foreign body at that point. But even if he felt it was in the sclera, he would leave it alone as long as the eye remained quiet.

Traumatic Cataract.

Dr. W. F. Matson presented a woman of twenty-two years, with an opacity in the right lens which was first noticed February 18th, when vision of that eye was much reduced. As a child she had sore eyes. Seven years ago the upper margin of the right orbit was struck against a desk, with loss of sensation in the region of the injury for about a year. Last January she struck her head on a door. No fundus reflex; vision, fingers at less than a meter. Examination of the urine was negative. Although the tension had been somewhat elevated, the question as to needling was asked.

Discussion.—Dr. Black thought the cataract traumatic and favored needling it. The age of the patient was favorable for the operation, which was desirable for cosmetic reasons, to improve the visual field on that side and to save a useful eye for the future.

Dr. Jackson thought the appearance of the eye suggested recent injury to the lens which seemed to be in the state of swelling, so that he would wait a month or so before needling it. If the lens became very opaque, he would try to insert a needle into the nucleus, otherwise the loose nucleus might remain after absorption of the cortex.

Neuroretinitis.

Dr. D. A. Strickler presented a case of neuroretinitis involving both eyes, with cloudy vitreous and vision of 20/200. The man gave a specific history dating from June, 1912. The eyes were affected in November, when he was put on mixed treatment and three doses of salvarsan. His condition improved somewhat, but is now about stationary. The question was as to his further treatment.

Discussion.—Dr. Jackson regarded the case as one of malignant syphilis and would continue the mixed treatment with more salvarsan.

Dr. Crisp suggested that the mercurial treatment should be by injection.

Meeting of April 19, 1913. Dr. Elmer R. Stilwill presiding.

Tobacco and Alcohol Amblyopia.

Dr. W. A. Sedwick presented a man of fifty years, with a central scotoma in each eye. When first seen, vision was 15/200 in each eye, improving to 15/80 with correcting lens. He had used considerable tobacco and alcohol. Transillumination of the sinuses was negative. The pupils reacted to both light and convergence, tension was normal, and there had been no inflammation. The fundus appeared normal except for a pallor of the temporal side of each disc. The patient had apparently seemed quite well until three or four months ago. Wassermann was negative. He has been put on iodid of potash and strychnin and stopped tobacco. The case was probably one of tobacco amblyopia.

Discussion.—Dr. Spencer thought he saw in the left eye a sharp bending of the vessels at the edge of the disc.

Dr. Jackson thought toxic amblyopia the probable diagnosis. Recovery would depend on freedom from tobacco and alcohol, and might take several months.

Dr. Strader had seen a case in which, in spite of cessation of tobacco and alcohol, the patient was much worse after several months. He was a saloonkeeper, spent twelve hours daily in the saloon, and was exposed to a very heavy atmosphere of tobacco smoke.

The opinion was generally expressed that the tobacco atmosphere would have an important influence on the eyes.

Dr. Spencer quoted Fuchs as stating that those constantly in an atmosphere of tobacco smoke might have tobacco amblyopia.

Dr. Stilwill suggested that the patient might be benefited by the high frequency current.

Corneal Ulcer Treated With Nitric Acid.

Dr. W. C. Bane presented a patient who had had a small marginal ulcer in the left cornea which had been treated by

application of 20 per cent nitric acid. The ulcer was smaller the next day, and after two days did not take the fluorescein stain.

Discussion.—Dr. Neeper referred to a case which had been sent to him recently by an accident insurance company. The man was seeking indemnity from the company, saying the ulcer followed a foreign body. The eye now showed two ulcers which had continued to stain with fluorescein, which was against traumatic ulcer.

Congenital Coloboma of Iris and Choroid.

Dr. H. Aufemwasser presented a man in whose right eye there was a typical inferior coloboma of the iris, accompanied by slight notching of the lower margin of the lens and an extensive coloboma of the choroid, reaching almost to the disc. Vision, one-half. When the patient looked up, the external aspect of the eyeball was flattened below. The choroidal coloboma was quite deep, the retinal vessels dipping over its edges.

Discussion.—Dr. Jackson stated that the depth of the coloboma was especially marked posteriorly, reaching 8 or 10 D., and the external flattening probably corresponded to the anterior part of the coloboma.

Penetrating Steel Injury.

Dr. D. H. Coover presented a machinist, aged twenty-two years, whose right eye had been injured by a piece of steel on March 20, 1912. The fragment had entered at the nasal limbus. For ten days after the injury there had been some pain and congestion. About three months after the accident the patient noticed that the color of the eye was brown, and he had several short inflammatory attacks. Vision was 6/20. The eye presented a deposit of the posterior surface of the lens, a yellowish exudate behind the lens with haziness and floating opacities in the vitreous. A skiagraph showed a foreign body 5 mm. back of the cornea, 3 mm. below the anteroposterior axis of the eye, and 5 mm. to the temporal side. Application of the magnet to the eye between the inferior and external rectus caused pain. The eye was quiet. The question as to treatment with or without removal of the body was discussed.

Discussion.—Dr. Walker and some others present considered removal advisable.

Dr. Bane would enucleate the eye without attempting to remove the foreign body, because of the risk of sympathetic inflammation.

Dr. Jackson recalled a case of foreign body back of the lens in which the patient had come on account of beginning siderosis, eighteen months after the injury. The foreign body was removed and the eye still had good vision. He would make an incision as far back as possible, to avoid the ciliary body, and go in with scissors to cut into the capsule surrounding the foreign body. He thought there was a fair chance of saving useful vision if previous use of the magnet had not too greatly disturbed the foreign body.

Dr. Hilliard stated that he had seen the patient in May, 1912, when it had been stated that the injury had taken place about a month previously. With the exception of a suspicious appearance below, the media were clear. Vision equaled 20/30. Because X-ray was refused the case was not treated.

Dr. Conant had also seen the case in May, but he could not discover a wound of entrance and did nothing. Two or three months ago the man came, reporting a failure of vision. Siderosis had then begun.

Dr. Strader referred to a case of penetrating steel injury, in which another surgeon had reported that X-ray showed the foreign body to have passed through the globe into the orbit. Two months later there was marked siderosis, the lens was absorbed and the eye remained perfectly quiet with fairly good vision.

Choroiditis.

Dr. J. A. McCaw presented a man of twenty-eight years, whose left fundus showed extensive choroidal changes, and especially in the macular region, with extensive pigment deposits. The patient gave a history of a slight injury to the left eye five weeks before, and stated that he had first noticed blurring of vision a week ago. Wassermann test was negative and von Pirquet positive. Test of urine showed a few pus cells and small granular casts. Two upper left molar teeth were carious, but there were also some diseased teeth on the right side. Vision of this eye was 20/80. There was a suggestion of swelling of the optic disc.

Discussion.—The opinion was expressed by several members that the case was not of recent development.

Dr. Jackson remarked that the case was obscure, the fundus disturbances being in no way related to the injury. The condition of the nose should be investigated, as it did not look like a tuberculous or syphilitic case.

Sarcoma of the Ciliary Body.

Drs. W. C. Bane and W. H. Crisp showed microscopic specimens from the eyeball demonstrated by Dr. Bane at the meeting of February 15, 1913. The growth was a small spindle cell sarcoma of the ciliary body, entirely replacing that structure in the region of the growth, and extending slightly into the root of the iris. There was a minute metastasis on the surface of the sclera, but the rest of the eyeball seemed free from invasion. The growth was moderately pigmented. The pigment layer of the retina was very plainly seen running for some distance into the growth; evidently stopping at the point at which the tumor had broken through into the vitreous chamber.

Iritis Simulating Glaucoma.

Dr. H. R. Stilwill presented a girl of seven years, with blurred vision in the right eye. There was a general haziness of the cornea, the pupil was moderately dilated, the eyeball greatly congested with photophobia; no tenderness, although the tension was plus. The pupillary reflex was feeble, and the fundus could not be seen.

Discussion.—Dr. Spencer suggested that the case might be one of interstitial keratitis.

Dr. Neeper would try to dilate the pupil with atropin, on the possibility that the pupil had been fixed in a partly dilated condition.

Dr. Coover had seen cases of iritis where the tension was for a while slightly increased.

Dr. Walker thought the case one of cyclitis causing increased tension, and advised hot applications.

Dr. Jackson remarked that cases of glaucoma in young persons were commonly bilateral and ran a slow and chronic course. He would use atropin and try to make an ophthalmoscopic examination, and would also investigate the possibility of tuberculosis or intraocular tumor.

Detachment of the Retina.

Dr. H. R. Stilwill presented a man of sixty-nine years, who, without previous history of injury or strain, noticed cloudy vision April 4th. A week later here was a large retinal detachment in the upper part of the fundus, covering the upper third of the disc, extending above the center of the macula. At that time vision was 5/10. The detachment has gradually extended and vision is now 5/120. Transillumination negative.

Discussion.—Dr. Cooper advised tapping the subretinal exudate and forcing sterilized air into the vitreous.

Dr. Jackson suggested tapping with the use of normal salt solution.

Dr. Bane advised potassium iodid. Some years previously he had seen a case where improvement had occurred under such treatment.

Dr. Sedwick would use subconjunctival injections of citrate of soda.

William H. Crisp,
Secretary.

ST. LOUIS MEDICAL SOCIETY,

OPHTHALMIC SECTION.

Meeting of April 2, 1913.

A Case of Foreign Body in the Eyeball.

Dr. E. H. Higbee: The patient, a male, Greek, was first seen with a complete synechia of the iris, some swelling of the lids and marked injection of the conjunctiva and sclera. Tension was minus, no marked tenderness on palpation of the globe, not much pain. The eye had been struck with a piece of hot rivet, about one month previous, since which time treated by a physician, who did not use atropin. An X-ray shows a foreign body 5 mm. below the horizontal plane, 5 mm. to temporal side of the vertical plane and 4 mm. back of the cornea. Enucleation was advised because of the situation of the foreign body on the ciliary body. The patient, however, refused operation and also foreign body removal.

Discussion.—Dr. Shahan recalled the case of a boy eight or ten years of age, who, while playing with a ten-penny nail on the end of an elastic band, was struck in the eye by the nail, which got loose and flew back. Complete hyphema made iridodialysis seem probable. On the second or third day the blood cleared away so that vision was decidedly improved; on the fourth or fifth day only a small clot remained in the lower nasal quadrant, with normal vision, and a small cilium was found in the center of the anterior chamber, where it remained, apparently doing no harm.

Another patient had been advised to have his eye removed after having been struck on the sclera by a piece of steel, which had cut to the choroid but had not penetrated the globe. Although his vision was very low, under ordinary treatment the inflammation rapidly subsided, the hemorrhage was absorbed from the anterior chamber and his vision became 20/30 and remains so.

Dr. Post asked Dr. Higbee if he had taken precaution against a damage suit. He recalled a case where enucleation had been advised and later the physician was sued three times

after the second eye was lost, so that he considers it wise to guard against such an end.

Dr. Shoemaker reported a case of a boy about eight years of age, who had been wearing a plus 0.5 D. spherical, prescribed by a competent oculist. He was playing with some other boys and had filled a bottle with water, corked it up and put it in a fire to watch developments. The bottle exploded and a piece of glass struck him in the eye, producing a cut through the temporal half of the cornea into the ciliary region, causing some prolapse of the iris, but no iridectomy was done. The eye healed with slight disfigurement of the pupil. A plus 8 D. spherical gives him 18/24+ vision. No cylinder accepted. It is difficult to account for the change of refraction, unless it is due to a change in the position of the lens.

Dr. F. Parker spoke of a patient who thought he had cold or conjunctivitis. Upon examination with X-ray he found a foreign body in the eye and advised removal. Operation was seriously objected to and he was threatened with a malpractice suit, which would likely have occurred if he had not had a picture to prove his assertions.

Dr. Higbee, in closing, said he had taken no special precaution against malpractice, as the facts, including X-ray, made such a course impossible.

Anterior Scleral Trephining in Glaucoma.

Dr. J. Ellis Jennings: After an historical review of operations for the cure of glaucoma, including iridectomy and sclerotomy, he referred to the newer operations. Iridectomy does not cause a cystoid scar, so scleral trephining was advocated by Fergus and Elliott. He spoke of Elliott's work and described the technic of the operation.

He reported two cases. Case 1.—Mr. C. E., age 67 years, was first seen September, 1912, having had repeated attacks of pain for several years. The eyeball was red and painful, the anterior chamber very shallow, the pupil about 4 mm. in diameter, the lens opaque and tension +2, with no perception of light. Eserin, first in weak solution and then stronger, up to 1 per cent, was used without effect on pupil or tension. The operation was done November 14, 1912. There was a gush of aqueous on removal of the tag of sclera, but no prolapse of iris. The flap was replaced and secured with two sutures.

Three months after the operation there was no return of pain and the tension was normal.

Case 2.—Mrs. J. C., age 54 years, complained of defective sight of the right eye, September 28, 1912. Vision: R., 15/100; L., 5/4. Detachment of the retina above, below and to the temporal side in the right eye. After two weeks in bed, with the eyes tightly bandaged, the detachment remaining the same, she went home. March 10, 1913, she reported, after having had severe neuralgic pain in the right eye for five days. The eyeball was intensely injected, the cornea steamy, anterior chamber almost obliterated, pupil semidilated, lens opaque, no light perception and tension +2. Eserin failed to contract the pupil or reduce tension. The sclera was trephined on March 14th. No gush of aqueous or reduction of tension followed the removal of the tag of sclera. Delicate forceps were introduced into the anterior chamber, but the iris was evidently glued fast and could not be loosened.

He then made pressure on the globe until a large bead of vitreous welled up into the wound, which reduced the tension to normal. The conjunctival flap was secured in its normal position, and sixteen days later the tension was normal and the patient free from pain.

Discussion.—Dr. Charles: When the literature on trephining first appeared, it appealed to me because of my experience with a case which I reported to this section in 1909, of "Scleritis with Perforation and Formation of a Conjunctival Cyst." A negro woman was admitted to the Female Hospital, giving a history of rheumatic pains and ocular discomfort for a long time, with a lump above and to the inner side of the cornea, a hypopyon ulcer, iritis, ciliary tenderness (vision equaled fingers at one foot), a large subconjunctival "cyst" in upper and inner quadrant. Pupil excluded. After dilatation with atropin the subconjunctival fluid disappeared, leaving a large round hole 3 mm. in diameter in the sclera over the ciliary region with clean-cut edges. When the atropin was not used the pupil again closed and the "cyst" reformed. The case convinced him that since it was possible to maintain an open communication between the interior of the eye and the subconjunctival space, the plan was feasible to establish drainage at the filtration angle.

Dr. Loeb asked about the condition of the retina in Dr. Jennings' last case.

Dr. Luedde made a plea for more accurate tension records with a standard tonometer, the older method being too much a matter of personal interpretation.

Pictures of Malignant Syphilis With Demonstration of an Adaptor for Taking Stereoscopic Pictures.

Dr. W. H. Luedde reported the cases of two adult males, white, one aged 23, the other 20 years. One, of good physical development, ended fatally. The other presented showed stunted growth, marked kyphoscoliosis the result of psoas abscess several years ago. He was just recovering from a bilateral interstitial keratitis with a strongly plus Wassermann. In the other well-nourished man reaction was feebly positive in the early stage and negative just before death, so that Wassermann test is not a measure of the severity of lues. The fatal case was first seen by Dr. H. E. Miller because of nasal sinus disease with some external swelling apparently connected with the frontal sinus. An external operation showed unusually extensive necrosis. Vigorous specific treatment (hg. and k. i.), which had been begun, was continued. Cultures chronic. Progressive destruction of the tissues, bony and superficial, was not stopped by salvarsan. Sloughing eyelids brought the case to him. He died eight months after the beginning of the attack. Wassermann was negative just before death.

In the other case the patient has recovered, but the Wassermann is strongly plus, as at first. Stereoscopic pictures of the first case were made and first demonstrated here, with a pair of specially designed spectacle "fronts" added, in front of an inexpensive Brownie sterokodak. It enables one to get pictures which portray special clinical processes in life-like manner without the expensive apparatus. The "fronts" consist of a pair of prisms with bases in combined with convex spherical lenses of any desired strength, according to the size of image desired. Any oculist can make them up from his trial case by using a frame with an open cells here shown, or they can be ground to order by the optician. Stereoscopic photographs from D. L. Harris' collection at the Snodgras laboratory were also presented.

Discussion.—Dr. R. Schlueter related his experience with the fatal case, which at first had no lesion. Later there was a

sinus leading to the bone in the inner third of the right lower eyelid. Detail of treatment was given.

Dr. Loeb suggested dionin for the first case, and asked if spirocheta pallida had been demonstrated in the wound.

Dr. Higbee has had indifferent success with dionin in corneal opacities. Massage, without local medication in several cases of keratitis under internal medication, has given very gratifying results—he believes a more rapid cure.

Dr. Post has been disappointed with massage.

Dr. Luedde, in closing: No attempt was made to demonstrate the spirocheta pallida. As Dr. Schlueter has said, antisyphilitic treatment was given on the clinical diagnosis of syphilis. No treatment checked the necrosis. The feeble Wassermann reaction was obtained before he saw him. He has not found dionin of value in clearing such opacities.

BOOK REVIEWS.

The Relations of the Lacrimal Organs to the Nose and Nasal Accessory Sinuses.

By Dr. A. Onodi, Director of the Rhino-laryngological Clinic in the University of Budapest. Translated by Dr. Dan McKenzie, London. Published by William Wood & Co., New York, 1913.

The influence of diseases of the nose and nasal sinuses in causing dacryocystitis, and especially the recent attempts to cure this disease by making artificial openings into the nose, make this book a very timely and valuable one. The text and the explanation of the plates are given in German, French and English. The former consists of a description of the topographic relations, a discussion of the rhinologic etiology of diseases of the efferent lacrimal apparatus and a review of the endonasal and extranasal operations. The plates, forty-five in number, are photographic reproductions of sections of the skull, life size. They show the relations in infants, children and adults. C. L.

Bulletin de la Societe Belge d'Ophtalmologie, No. 35.

Published by Ad. Hoste, 21-23 Rue du Calvaire, Gand, Belgium.

This is the report of the thirty-fifth meeting of this society at Brussels, April 27, 1913. Papers were read as follows: De l'hydrophtalmie et de son traitement, Tacke; Scleréctomie dans le glaucome aigu, Bettremieux; Quelques considérations sur les voies lymphatiques de l'oeil et de l'orbite, Lebouceq; De l'utilité du diploscope de Remy en pratique courante, Marbaix; Les injections sous-conjonctivales, Thienpont; and Le nystagmus des mineurs, la présence dans les mines metalliques, Stassen. C. L.

Surgery of the Eye.

By Ervin Török, M. D., and Gerald H. Grout, M. D. Published by Lea & Febiger, Philadelphia and New York.

Although there are now several good works on ophthalmic surgery, this one will prove a very useful one to the beginner

because of its thoroughness of detail and its numerous illustrations. However, the description of the after-treatments is not on a par with the rest of the work. While sufficient for the practiced surgeon, it implies more knowledge than possessed by the average beginner. The reviewer would criticise, also, the use of the terms "American Method" and "European Method" to indicate the position of the operator, since the choice of position depends on whether or not the operator is ambidextrous, and not on his nationality. C. L.

Bulletin de la Societe Belge d'Ophtalmologie, No. 36.

This is a report of the thirty-sixth meeting of the society at Ghent, August 2-3, 1913. The following papers were read: De Grosz—The Treatment of Strabismus; Hertel—Changes in the Intraocular Tension Due to Osmotic Processes; Kuhnt—The Surgical Treatment of Trachoma; Fuchs—Opacities of the Lens Following Suppuration of the Cornea; De Lapersonne—Optic Meningitis in Recent Syphilis; Wicherkiewicz—Implantation of Skin Into Tenon's Capsule After Enucleation; Axenfeld—(1) Aplasia of the Anterior Surface of the Iris, (2) Retinitis Externa Punctata Following Pulsating Exophthalmus, (3) Retinitis Externa Ossificans Simulating a Subretinal Tumor; Von Szily—Investigations Upon the Regeneration and Healing the Wound of Excised Cornea; Weekers—Experimental Investigations on the Treatment of Ulcus Serpens of the Cornea by Heat; Van Duyse—Chondrosarcoma of the Orbit; Leboucq—Researches on the Lymphatics of the Eye and the Orbit; Van Lint—(1) Operation for Cataract With a Sliding Conjunctival Flap, (2) The T Shaped Sclerotomy; Chevallereau—Suture of the Cornea in Cataract Operations; Terrien—Encapsulated Sarcoma of the Orbit and Its Extirpation With Conservation of the Eyeball by Means of the Curvilinear Incision of the Orbital Margins; Marquez—Prepapillary Arterial Branch Penetrating Into the Vitreous; Tacke—Ophthalmoplegia Complicated With Neuralgia of the Trifacial Nerve and Its Operative Treatment; Callaert—Persistence of the Impressions of Images Upon the Retina; Rutten—Reply to the Questions in the Investigation Upon Mmer's Nystagmus Conducted by the French Department of Mining. C. L.