greater freedom in the after-treatment. The patients being provided with a bandage, may return home, and can, for the most part, resume their occupations upon the second or third day afterwards.

Having examined the acuteness of vision of the greater number of my patients upon the day following the operation, and the field of vision two or three days afterwards, I am in a position to state that an improvement was evident in most cases, and that in no instance was there a deterioration of vision. In one case,* where I had to deal with a chronic irritative glaucoma, which, when the other eye was found affected with retinal apoplexies, was recognised as of a hæmorrhagic nature, the vision after the sclerotomy was found considerably diminished in consequence of a hæmorrhage situated at the macula lutea; but yet this disturbance of vision was of short duration only.

When, after sclerotomy, the anterior chamber is only slowly re-established, an alteration in the refraction of the eye may be observed, owing to displacement of the crystalline lens; but we have not found astigmatism to become developed, as often happens after iridectomy, putting the patient in a very uncomfortable position. In short, sclerotomy, except for a slight transitory change in the refraction, leaves the operated eye absolutely intact, with but a short period of irritation.

I mention, in my *Thérapeutique Oculaire* (page 383), the case of a medical man upon whom I performed sclerotomy for simple chronic glaucoma, which had damaged his vision so much that he was unable to count fingers at more than a *mètre* and a half (nearly five feet). The defect in the field of vision at the inner side approached close to the point of fixation. This operation was performed in November 1877, and I had an opportunity of observing its effect in May 1879, when the patient came to request that I would perform the same operation upon his other eye, although it possessed perfect acuteness of central vision and an unblemished field of vision. Believing that he had felt some premonitory signs of glaucoma in the second eye, he wished to have the sclerotomy performed in order that he might leave Paris without fear. I could not refuse him this operation, for, in the eye which had already been operated on, there was an enlargement of the field of vision and an improvement in the central vision, fingers being now counted at two *mètres* and a half (eight feet and a quarter). This patient's case allowed me to satisfy myself again how very little visual trouble is caused by sclerotomy, for the sight was absolutely good from the second day after the operation.

Since the commencement of the year 1879, I have performed forty-eight sclerotomies, most of which have been noted with great care by Dr. Manversen of Bucharest for an essay on the subject. These numerous operations confirm me in the opinion already expressed—namely, that in the various forms of chronic simple glaucoma, sclerotomy is not only as efficacious as iridectomy, but that it is far superior to the latter, being free from the disagreeable effects of the excision of a portion of iris.

TOBACCO AND ALCOHOL AMBLYOPIA.†

By T. HIRSCHBERG, M.D., BERLIN.

WHEN I was in London, two years ago, I saw and heard what I had learnt before by reading, that a greater amount of amblyopia and amaurosis was attributed to the abuse of tobacco in England than on the Continent, and particularly more than with us in Germany.

In my account of my London tour, published in 1877 (*Deutsche Medicin. Wochenschrift*), I suggested that it would be very useful to submit this important difference between English and Continental views to discussion at an international ophthalmological congress. It therefore affords me much gratification to have the opportunity, by the kind request of your secretaries, of opening a discussion on this interesting subject at the Annual Meeting of the British Medical Association.

Tobacco amblyopia was discovered by Mackenzie of Glasgow, and much attention has been paid to the subject in England; the original term, tobacco amaurosis, being still retained by some authorities. It is true that English authors differ widely in the share which they attribute to tobacco by causing failure of sight. For instance, in the admirable treatise of Mr. Soelberg Wells (1869), we find the following passage. "I fully admit the fact, that the excessive use of tobacco (but most frequently together with other causes) may produce considerable impairment of vision, and finally.....even atrophy of the optic nerves. But I cannot, from my own experience, accede to the doctrine, that there is

anything peculiar in the form of atrophy of the optic nerve.....I believe that, in the commencement of the amblyopia of smokers and drunkards, the disturbance of sight is at first only functional.....But if the cause persist, the disease passes over into an organic lesion." Mr. Brudenell Carter, who formerly passed some considerable time amongst a people—the Turks—who smoke almost without cessation, has expressed to me his grave doubts as to the existence of tobacco amaurosis. Mr. Jonathan Hutchinson, who for many years has bestowed great pains on the investigation of this subject, and to whom I am personally indebted for many remarks in connection with it, stated in his first paper (in 1864), that a peculiar form of amaurosis or atrophy of the optic nerves was caused by tobacco; but in his most recent paper (1876), based on a re-examination of a large series of patients affected with tobacco amblyopia, he states, that a large majority had quite recovered, and that scarcely anyone had become worse. Lastly, Mr. Nettleship published, two years ago, a series of fourteen cases of the amblyopia of smokers, in all of whom mere abstinence from tobacco was followed either by recovery or arrest of the disease. Notes on the diagnosis of tobacco amblyopia by Mr. Nettleship appear in the volume of *St. Thomas's Hospital Reports* for this year, and contain full details of twenty-three cases.

The influence of tobacco upon sight has also for many years been to some extent admitted in Germany, and more freely in France by Sichel and Galezowski (*Des Amblyop. toxiques*, Paris, 1879). A. von Graefe, in 1865, drew out very clearly the differences between progressive amblyopia with restriction of the field of vision, and curable amblyopia with normal periphery of the field but with a central defect (central scotoma). He considered that excessive indulgence in alcohol, much smoking of strong cigars, debauchery, abdominal obstruction, irregular sleep, and overwork of the eyes, might act singly, but far more often acted together, in producing amblyopia; and that it was difficult to estimate the etiological value of the different factors. He goes on to say that the much greater frequency of amblyopia in men than in women has suggested the opinion that smoking is a principal cause. But since many other influences, injurious to the nervous system, act far more on men than on women, he concludes that excessive smoking is to be regarded as constituting only one element in the production of amblyopia. For some years, these statements of von Graefe were fully admitted in Germany, and the papers of Professor Horner of Zürich and of his pupils Erisman and Schön, and of Professor Leber, now of Göttingen, were all based upon von Graefe's ideas. Considering that an immense number of men smoked regularly without damage, and that cases of benign centric amblyopia in workmen addicted to the abuse of alcohol were very common, there was a proneness in Germany to attribute the symptoms principally to the alcohol, and to admit pure tobacco amblyopia only in those cases where there were also clearly marked symptoms of chronic nicotine poisoning. Both forms of amblyopia, that from tobacco and that from alcohol, seemed to us very similar in their clinical symptoms as well as in their prognosis. Both were generally known under the same name of amblyopia from intoxication, or toxic amblyopia, even in my own earlier statistics published by my late assistant, Mr. Pufahl, now in Paris. A real progress was made in Germany by Förster, who published a short abstract in 1868, and a full monograph on this subject in 1876. He points out that the existence of tobacco amblyopia is fully proved *ex juvenilibus*, if passionate smokers who become amblyopic are found to improve in sight after having relinquished their excessive use of tobacco. He also shows that the amblyopia of both eyes, which interferes with the reading of small print, depends upon a central scotoma, or dull, or even dark, region in the middle of the field of vision, which reaches from the fixation point to Mariotte's blind spot; that within this region the perception of red is especially defective; and that the periphery of the field remains normal. Förster states that this form of amblyopia is characteristic, but not pathognomonic; it occurs in almost all cases of tobacco amblyopia, but also in some others. The ophthalmoscope shows a normal fundus, but the papilla is palish. The patients, all males, are from thirty-five to sixty-five years old. A sedentary life, want of sleep, and bad appetite or bad nutrition, are the co-operating causes. Progress of the disease to complete atrophy of the optic nerves is very rare. A central defect in the field of vision may be permanent, but generally the patients recover if they can give up smoking. He considers that the morbid process is localised in the optic nerves, not in the brain.

In supplementing this brief historical abstract by a short statement of my own views, I would say that I have, in common with most other observers, found the fundus normal in the early period of tobacco amblyopia, whilst after some time the outer quarter or half of the disc grows gradually rather pale. In the diagnosis of this disease and of similar cases, we should not overestimate the value of ophthalmoscopic examination, but rely rather on an exact examination of the whole retinal function. The field of vision of a normal eye in steady fix-

* I might mention the case of a medical man affected with insufficiency of the aortic orifice, who was operated on for attacks of glaucoma, and on the day after the operation saw his patients, but on the fifth day a copious hæmorrhage took place into the anterior chamber.

† Read in the Subsection of Ophthalmology at the Annual Meeting of the British Medical Association in Cork, August 1879.

tion furnishes to our mind a picture in which only a very small centric point of one degree's aperture is carefully executed. The remainder is more and more roughly stretched in proportion as we pass towards the periphery. Only a limited pericentric region of about twenty degrees aperture shows saturated and bright colours; further towards the periphery one colour after another fades away in a regular order, and the extreme periphery is colourless as painted grey in grey.

This diagram shows the normal field of vision with the boundaries for white and the three principal colours. It also shows the principal isopter curves, as I have termed the lines of equal excentric vision. The following seventeen cards give the field and history of all cases of chronic amblyopia without decisive change in the fundus, which, after my return from London, have been observed by myself during nine months and among a number of two thousand five hundred patients. Thirteen of these were cases of toxic amblyopia. In my earlier statistics of twenty-two thousand patients, I found one hundred and twelve such cases; these numbers give a little above five *per mille*.

The first question for discussion is as to the actual existence of such a disease as tobacco amblyopia. Notwithstanding some negative, and even adverse, opinions, I shall be very much surprised to hear any but an affirmative reply to this question from the majority of the members of this meeting. The proof lies, in my opinion, in the recovery by mere abstinence, as observed by Mackenzie, Sichel, Hutchinson, Förster, Nettleship, and myself. If a chronic amblyopia in a heavy smoker have existed for some months, and have increased slowly but steadily, some days of abstinence may be sufficient, as I have observed more than once, to produce a moderate but decided improvement of sight; but perfect recovery requires a longer time: some weeks or months. The impairment of vision from tobacco is always binocular and characteristic. The complaints of the patients are due to a centric scotoma or limited dimness in the central region of the visual field of each eye. The scotoma is of more or less oval shape, includes the fixing point, and reaches to the blind spot. If the eye be fixing the middle of the field, a white piece of paper, placed anywhere in the defective area, seems to the patient to be grey; further, as Förster has shown, a red piece is either not seen at all, or appears very dark; and, as I have myself observed, a green piece becomes greyish, and a blue one frequently a paler blue or indistinct. The scotoma is never absolute; the white paper, if well illuminated, will never disappear entirely within the scotoma. Corresponding to this impairment of the central part of the field, the acuteness of central vision is reduced to one-third, one-tenth, or even in rare cases to one-thirtieth of the normal. Both eyes are equally affected, or one sometimes a very little more than the other. The power of reading common print is abolished; but even in the worst cases the number of fingers can be counted up to a distance of 5' or 6'. The fundus at first is normal, but after a time the disc becomes palish. To this definition of tobacco amblyopia it must be added, that we never meet with the disease in women.

A second and very important question for consideration is, whether this disease ever ends in complete loss of sight—amaurosis. For my own part, I believe that this never occurs. Amaurosis begins and progresses differently. In the earliest commencement of progressive atrophy, although the patient may still read the smallest print, and the disc may be almost normal or only a little pale, the extent of the visual field is reduced, and especially the boundaries of the fields for various colours are constricted. The green field first, then that for red, and finally that for blue, shrinks more and more to zero. Even when only a small residue of blue perception is remaining, central vision may still be as much as one-fourth, which is more than commonly met with in cases of tobacco amblyopia, even when they first come under care. You will never find a sharply limited central scotoma, nor the condition remaining stationary for months, nor even a partial recovery, in cases of common amaurosis from progressive atrophy of the disc. It has been affirmed, but in my opinion not yet proved, that abuse of tobacco often leads to progressive atrophy of the optic nerves. I have never seen a case of tobacco amblyopia progressing to complete amaurosis; whilst, on the other hand, it is beyond doubt that not only non-smoking men, but also, though rarely, women, are affected by progressive atrophy of the optic nerves. I may instance the case of a poor man of fifty-two years, accustomed to smoke the strongest shag tobacco day and night, who was suffering during six years from amblyopia, and showing the clearest symptoms of chronic nicotineism. Both discs were palish, central vision $\frac{1}{10}$, but the boundaries of the visual field were perfectly normal. I have never yet met with a case of progressive amaurosis in which such a state of function remained after the disease had existed for six years.

I will not occupy the time of the meeting by discussing the hypotheses as to the nature of tobacco amblyopia. It may, however, be of interest to say a few words as to the quantity of tobacco in use and in disuse. In Germany, hitherto, the yearly consumption is about two-and-a-half

pounds for each person; in England, perhaps, one pound and a fifth; in France and Austria one pound and two-thirds. The average for the smoking German is ten pounds a year. Some of my patients consumed a hundred pounds, principally of bad tobacco, but others only twenty or thirty pounds a year. Most of them were either underfed or suffering from loss of appetite. Here is a *circulus vitiosus*; abuse of tobacco diminishes assimilation and lowers the strength; hence increased susceptibility to the noxious substance and chronic poisoning.

The second and shorter part of my subject relates to amblyopia caused by alcohol. It is very similar to the amblyopia caused by tobacco. I do not speak of acute or subacute amblyopia following recent and excessive increase of the daily quantity of alcohol, but only of chronic alcoholism. I know very well that some of my English friends will not accept this peculiar form; but I have met with cases which do not seem to admit any other explanation. Patients who do not smoke at all, or only a trifling quantity (say one pipe or cigar daily), nor make any other use of tobacco, but have been for a long time heavy drunkards, are slowly affected with amblyopia. Central vision in both eyes is lowered down from $\frac{1}{2}$ to $\frac{1}{10}$; the boundary of the visual field is normal, but a central scotoma is found, which reaches from the fixation point in all directions 5°, 10°, or even 20°. If the central scotoma be very large, there is perfect blindness for green and red, because the fields of normal perception of these colours are covered by the scotoma. I may suggest that this form of colour-blindness is not so unfrequent, and is perhaps more dangerous for railroad and marine officials than the common form of congenital colour-blindness. Temperance may be followed by a return of good central vision before normal colour-perception is restored. The optic disc is normal or a little pale in the outer half.

Since abuse of tobacco and of alcohol often exist together, it is difficult, if chronic amblyopia follow, to discriminate exactly between the two causes. My English colleagues have observed that such patients may recover from the amblyopia if they give up the use of tobacco, although continuing to drink brandy. I have not been able to make exact experiments with patients under confinement. In my diagrams the quantity of both noxious substances is stated for every patient, and you may judge for yourselves. All the cases, whether of tobacco, or alcohol, or of combined tobacco and alcohol amblyopia, occur, as already stated, in men, and not in very young men.

Finally, in some cases of central scotoma with normal boundary of the field and almost normal fundus, no chronic poisoning by alcohol, tobacco, or any other substance, can be made out. Some of such cases are perhaps explained by an idiopathic retrobulbar neuritis.

PERIPHERAL DIVISION OF THE CAPSULE OF THE LENS.*

By C. E. FITZGERALD, M.D., Ch.M. (Dub.),

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MY object in bringing this subject before the meeting is, that it appears to me not to have received the attention it deserves in this country, if indeed it can be said to have attracted as yet any attention at all. If it really possess the significance which I believe it does, it must prove one of the most important modifications which has been of late years introduced into the operation for cataract; but, though present data regarding its results must still be deemed insufficient for *perfect* certainty, it is of the utmost moment that it should be given a fair and impartial trial by those who may have the means at their disposal of testing its efficacy. These remarks contain my excuse for bringing what is, after all, merely a preliminary communication before the meeting.

In a short paper, bearing date May 20th, 1878, and published in the *Archives of Ophthalmology and Otology* (vol. vi, Nos. 3 and 4, 1878), Dr. Knapp first proposed this method; and he subsequently brought the matter before the meeting of the Ophthalmological Society, at Heidelberg, in the following August.

Dr. Knapp says, that the manifold reactive processes, which for years he had observed to follow extensive laceration and partial removal of the anterior capsule of the lens, induced him to try some way "to reduce to a minimum the injury to the capsule, and, consequently, the reaction from it also, during the healing process of the extraction wound". At first, after making the corneal section and removing a portion of the iris, he divided the capsule of the lens along the corneal section; he then introduced the cystotome into the anterior chamber and divided the capsule from the centre of the pupil to the edge of the lens. He

* Read in the Subsection of Ophthalmology at the Annual Meeting of the British Medical Association in Cork, August 1879.