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.

soon, however, abandoned the latter, or vertical, division of the capsule; and he now simply incises the capsule in a position exactly corresponding to the corneal section. He lays great stress on the importance of the division being a *cut*, and not a *tear*; and, in order to effect this, he makes use of very sharp cystotomes, whose straight cutting edges form an angle of 120° to 150° with the stem. During the division of the capsule, slight pressure must be made with the traction-forceps, so as to cause the corneal wound to gape somewhat. By this means, the division is effected without the necessity of entering the cystotome into the anterior chamber.

Knapp alludes to the fact that von Gräfe had, from the beginning, laid stress on the importance of horizontal division of the capsule, to insure an easy expulsion of the lens; and Arlt draws attention to the same point, in his Section on Operations on the Eye, in von Gräfe and Sämisch's *Handbook*. In the discussion which took place at the Heidelberg meeting, Professor Dor spoke of having seen Guguet of Lyons perform this operation, and also stated that he himself had done it. This does not, however, appear to me to invalidate Knapp's claim to priority in the matter, as he is clearly the first who "has confined himself to the horizontal section as a general method", studied it from a scientific stand-point, demonstrated its advantages, and described the proper manner of performing it.

From Knapp's observations it would seem that, after the lens has been removed by this method, the wound in the capsule closes in a few hours, and any remnants of the cataract lie shut up in the bag—in fact, out of harm's way; and thus, one of the greatest dangers attending the operation is eliminated. One of the most remarkable features about the cases, however, is the almost total absence of any irritation after the operation. This was strikingly demonstrated in all the cases I saw in Dr. Knapp's Hospital last year, on the occasion of my visit to New York; and I have observed the same in nearly all the cases I have since operated on myself. With the exception of a slight conjunctival injection, one would find it hard to believe on the following day that any operation had been performed upon the eye.

As regards the results; at the time when Knapp made his communication at Heidelberg, he had performed forty-three operations by this method; and of these he had lost four, but they were all complicated cases. The medium result as regards visual acuteness was between $\frac{2}{3}$ and $\frac{3}{4}$.

The disadvantage of the operation, and the only one I believe which can be urged against it, is, that it is generally necessary to perform a secondary operation on the capsule a few weeks later; but this is attended with no trouble; and, as an argument against the proceeding, has little force when weighed against the increased safety of the operation itself.

The number of times I have performed the operation—twenty-seven in all—is, of course, too small to draw any definite conclusion from; but, taken in conjunction with Dr. Knapp's results, coupled with the fact that I have not lost one of them, and that the healing in all of them has gone on smoothly, they justify me in looking upon it as significant. I am not in a position to give the visual results in these cases, because some of them have not yet been accurately tested, nor have all of them, though needing it, undergone the secondary operation on the capsule; the average was about $\frac{2}{3}$.

On thinking over the subject lately, it occurred to me that if this method really eliminates the chief danger from the operation, it ought to be quite possible to remove a cataract, before it had reached maturity, with perfect safety. Accordingly, I extracted such a cataract on Friday last, at the Richmond Hospital. The operation went very well, and on Monday last, when I saw the patient, the eye looked quite quiet and he had no pain. I need scarcely say that, if this proceeding prove to be one which can be undertaken with safety, it will be an immense boon to those who are afflicted with incipient cataract. I ought to mention that I and my colleague (Mr. Swanzy) always perform von Gräfe's linear peripheral extraction, and that we instil eserine both before and after the operation, as recommended by De Wecker.

On Sunday last, I received a letter from Dr. Knapp, to whom I had written some short time ago. He says: "I am delighted with the good account you give of your last eighteen extractions. I, too, can say that, since last November, I have not had any reverses. Much depends on the delicacy of the operation; but I feel somewhat hopeful that, with good instruments and correct performance of every step, extraction can be made almost as safe an operation as iridectomy. I send you, simultaneously with this letter, a paper, which has perhaps already reached you, published in the second number of the eighth volume of the *Archives of Ophthalmology*. You will find in it a detailed account of my latest experience in cataract extractions. I have done the peripheral division of the capsule for almost two years, in all cases (about seventy-five); and am the more satisfied with it the longer I

practise it. There has been no iritis, no capsulitis, no cyclitis—certainly a very pleasing and comforting result."

I regret to say the paper Dr. Knapp alludes to has not come to hand, nor have I yet received the second part of the eighth volume of the *Archives*.

The advantages of this method may, I think, be briefly summed up as follows: 1. Simplicity of the operative procedure; 2. Less liability of doing injury than by the ordinary method; 3. Exit of the lens rendered easier; 4. Whatever portions of the cortical substances remain behind are, from the rapid healing of the wound, kept within a closed cavity, so that the conditions of the eye are practically the same as those which follow simple iridectomy.

CASE OF LATERAL CURVATURE OF THE SPINE DEPENDING UPON UNILATERAL PLEURO- PNEUMONIA.

By DAVID DRUMMOND, M.A., M.D.,

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R. G., AGED 10, a somewhat delicate, though moderately well nourished girl, was brought to the Children's Hospital in the beginning of August by her mother, who gave the following history of her child's illness. A month previously, she was laid up with cough and pain in the left side, extreme prostration, slight difficulty in breathing, and some fever. For this attack, she was kept in bed for ten days and attended to by a medical man. It then being deemed inexpedient to retain her longer in bed, she was allowed to go about, when it became apparent to her mother, on bathing her, that the right shoulder was higher than the left, and the spine was "bent to the right side". At this time, she still complained of some pain in the left side, and of cough.

Some days were allowed to elapse before it was decided to consult some one for the deformity, the original attendant having given up the case; eventually, the child was brought to a professional man, who recommended the case to the Children's Hospital, on account of the inability of the parents to pay for the necessary instruments to give support to the spine. When she was undressed, the deformity at once became apparent; the right shoulder was higher than the left, the posterior border of the scapula being tilted out from the ribs, presenting a "winged" appearance. The spinal column was markedly curved (convexity) to the right side in the upper dorsal region, with the usual compensatory curve to the left in the dorso-lumbar, the lower ribs on the left side being flattened and thrust somewhat forward, evidently due to the rotation of the bodies of the dorso-lumbar vertebrae to the right. Physical examination of the chest revealed a consolidated left lung, as evinced by marked dulness on percussion, increased vocal resonance, and fine crepitus somewhat masked by the presence of tubular breathing. The child was ordered cod-liver oil and Parrish's syrup, and the spine to be rubbed and sponged with salt water.

When seen a fortnight afterwards, the spine was quite straight, the most careful examination by inking the spinous processes failing to elicit the slightest degree of curvature. No other treatment but that recommended (above) had been attempted. The lung was nearly normal, air passing in freely, and there was no dulness on percussion, with a total freedom from pain.

REMARKS.—Without entering at length into the various theories which have been advanced as to the causation of lateral curvature, I would only remark that it seems now to be the fashion to ignore, at all events to a great extent, the muscular theory of Dr. Dods and M. Guérin, and in place to ascribe every case to the purely mechanical explanation. The case I have here briefly recorded is surely one in which pain played an important part in the production of the spinal curvature, for with a complete relief of the pleuritic pain the spine became straight in a very few days. The side being fixed to avoid as much as possible the friction of the inflamed pleura by what Mr. Hilton, in his *Rest and Pain*, terms "Nature's own process", an opportunity is consequently afforded the muscles attached to the vertebrae to rotate the same; for, as Mr. Adams shows in his classical work on the *Pathology and Treatment of Lateral and other Forms of Curvature of the Spine*, rotation precedes any lateral deviation of the spinal column.

Presuming, then, there is something in the "muscular theory", may we not have here a partial explanation of the vexed questions: 1. Why is the dorsal convexity nearly always to the right? 2. Why does lateral curvature occur so much more frequently in girls than in boys? May the inframammary pain of delicate girls, which is nearly always on the left side, and often severe, not have something to do in bringing about lateral curvature where there already exists predisposing causes, acting in a slower, but none the less sure, way than in the case recorded above?