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BY

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TOBACCO AMBLYOPIA IN DAILY PRACTICE, WITH ANALYSIS OF FIFTY CONSECUTIVE CASES SEEN IN 1900.

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A MAN, in the second half of life, who complains of inability to read, or of a mistiness in vision, is most likely presbyopic, if glasses do not give satisfactory improvement there is disease present.

The urine should be examined as a matter of routine. Poor vision, from retinitis, is sometimes the first complaint of a patient with albuminuria or diabetes. The knee-jerks should be tested, as optic atrophy may be the earliest of the long series of troubles due to tabes dorsalis, rarely preceding the loss of knee-jerk.

Having excluded Bright's disease and tabes, and neglecting great rarities, there remain as likely conditions to produce misty vision or inability to read, cataract, simple glaucoma, or tobacco amblyopia, either singly or in combination.

The following observations are based on an analysis of fifty cases seen by me during the past year, mostly at the Bradford Eye and Ear Hospital.

Tobacco amblyopia generally occurs in men, rarely in women, the age from 45 to 55 is commonest, embracing about 45 per cent. of the cases. It may occur as early as 26 in a man who had smoked half an ounce daily for two years.

CASE 1.—J. G., 26, miner. January 27, 1900, "cannot read the paper." R. $\frac{5}{24}$, L. $\frac{5}{18}$ not improved. Retinoscopy R. and L. emmetropic. Central colour scotoma, discs rather atrophic looking, O. D. itself trifle hazy, for two years smoked at least half an ounce thick twist daily.

Or may be seen as late as 86 in a man (Case 40) who had smoked a similar amount for many years. Patients are generally smokers of three ounces or more weekly of the coarse and dark kinds of tobacco; thick twist, dark shag, and honeydew are the most commonly mentioned. Some use as much as one ounce daily, as in Cases 2, 13, 14, 23. Many also chew. It is not a

necessary result of smoking, many men coming for other eye mischief who have smoked three to five ounces weekly without any trace of consequence in their vision. The disease may show itself insidiously, progressing for months, or come on rapidly in a week or two, as failure of central vision ; it is always painless. A quarter of the cases complain of difficulty in reading the newspaper (Cases 1, 3, 4, 12, 14, 18, 21, 28, 29, 35, 36), but distant vision is affected as well as near, and another quarter of the cases complain of a mistiness, a dimness or cloudiness (Cases 2, 6, 12, 17, 22, 27, 31, 34, 42, 46). This may also be referred to as a blaze of light, or a shimmering over objects (Cases 10, 14, 15, 39), or as Case 4, "bright linotype has dazzled my eyes," or as Case 13 "the eyes dither." Some think that they see better in the dusk (Cases 4, 19, 42) which is a symptom commonly elicited on enquiry. This may be put in a reversed way as by case 45, who complained that he could not see well in the mornings.

The light sense is reduced, and faces especially look smudgy and washed out, probably also from want of recognition of the red in the flesh tints.

On testing the acuity of vision it is very poor, often less than $\frac{6}{60}$—say about equal to counting fingers two yards off, and scarcely improved by glasses.

Retinoscopy shows at least three-quarters of the cases to be hypermetropic, and this amounts to three dioptres or more in a quarter of all the cases. It is interesting, as hypermetropes are supposed to be more liable to glaucoma, to optic neuritis, and a congested appearance of the nerve head is recognised as a usual accompaniment of such cases.

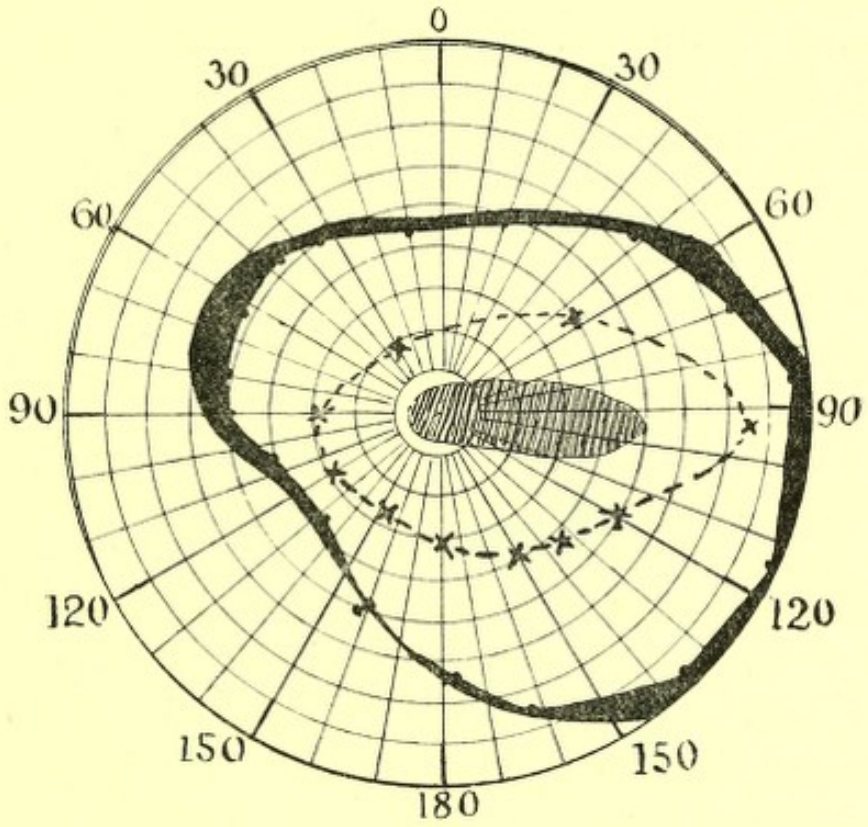
In about one-third of the cases some atrophic tendencies are noted in the fundus, the outer half of the disc generally being very pale, and in a few the arteries markedly narrowed.

Case 2.—M. W., 45 ; mule spinner. December 1, 1900 : R. $\frac{5}{60}$, L. $\frac{5}{36}$, not impaired. "Everything seems dim;" dilated pupils ; central scotomata ; smokes one ounce cut twist daily. Retinoscopy : R. + 3·5 D with + 2 D Astig. Ophth. : arteries are extremely narrowed and discs very white. December 15 : Will not give up tobacco and alcohol.

The limit of the field of vision for white is fairly normal with tobacco amblyopia, with simple glaucoma where central vision

had failed to a corresponding extent, or in optic atrophy there would be considerable contraction, particularly in the nasal part of the field. A chart must be made of the field—the rough method with hand movements used in the medical wards is quite useless here. Having taken the field it should be checked, the contracting field met with in hysteria, traumatic neurosis and alcoholism sometimes leading to error.

To detect these things the perimeter is necessary but not always at hand; fortunately we have a simple test which clears the ground at once.



Marked Case of Tobacco Amblyopia.—Diag. I. shows central scotoma for red in vertical shading, peripheral margin for red dotted, peripheral for white, the outline within the black area which represents the normal white field.

In tobacco amblyopia the lesion is at first limited to the macula, or the macular bundle of the optic nerve, so that there is at the macula and around it a region where colours are not well recognised, and at the macula itself an exceedingly small area where even white is not distinguished, the result being that the exact object looked at is not seen, for instance the small letters of newspaper print when looked at remain invisible.

Case 3.—A. T., aged 41, tailor. March 3, 1901 : V., R. and L. $\frac{5}{60}$, not improved. "Cannot read the paper," a mist before the eyes for eight months. From 2 to 3D. of hypermetropia, outer halves of discs white; very marked white lines along margins of vessels. Large central red and green scotomata. Periphery of field normal; periphery of red field normal. May 1. V. = $\frac{5}{24}$.

This is a negative scotoma. In the region of the field around this objects are seen but their colours are not clear; red being the most troublesome (a scotoma for red) and green next (a scotoma for green).

To detect the scotoma a little black square of cardboard with a square centimetre in the middle coloured red is shown to the patient; he may call the colour brown, or drab, or gold, according to the intensity of the scotoma, but he does not call it red—and sometimes cannot distinguish it, except as lighter or darker, than a similar square coloured green. The green he may recognise, or more usually calls it yellow, white, grey, or silver.

On looking over the notes of cases these colour affections in several have presented difficulties in detection (Cases 6, 11, 13, 16, 15, 38, 39).

In Case 4, the scotoma was not found till tried in dull light.

Case 4.—A. S., 44, compositor. R. < $\frac{5}{60}$ *cum*—3 = $\frac{5}{24}$; L. $\frac{5}{60}$ *cum*—3 = $\frac{5}{18}$. July 22: "Bright linotype has dazzled my eyes." No central scotoma; very tremulous; great smoker and drinker. About — 1·5 D. myopia. July 29: Central scotoma in reduced light, *i.e.*, red = "brown" and green = "stone grey." V., R. and L. $\frac{5}{24}$. September 16: Smoking again. R. $\frac{6}{18}$; L. $\frac{6}{36}$.

It is advisable to use smaller objects, a pin-head tipped with coloured wax for instance—to try in reduced light, and as one eye is sometimes more affected visually, to try each eye separately.

Case 5.—C. H. B., 44, carter. September 26: R. $\frac{6}{36}$; L. $\frac{6}{60}$, not improved. "Cannot see well for four or five months, it came on quickly." Fine fibrillary tremor of tongue; knee-jerks and pupils normal; outer half of right disc very white; central scotoma red = "white," green = "the same but darker." October 24: R. $\frac{6}{18}$; L. $\frac{6}{60}$. November 21: R. $\frac{6}{12}$; L. $\frac{6}{24}$. December 12: R. $\frac{6}{9}$; L. $\frac{6}{36}$. January 24: R. $\frac{6}{9}$; L. $\frac{6}{18}$.

Apart from great unilateral differences in vision, one eye often shows the colour scotoma better than the other, as in Cases 5, 7, 8, 10, 29, 46, 49.

In Case 10 there was a red and green scotoma in the right eye, and only a green scotoma in the left, a most unusual combination.

This disease originates in tobacco, but many debilitating causes may contribute to its onset. Alcoholic excess is frequently associated, its importance probably exaggerated. The Australian horses, which eat wild tobacco and become amblyopic, are certainly free from the suspicion of alcoholism. Nervous symptoms in tremor, rarely general, but common in the hands and tongue, are present in at least 10 per cent. and may be partly alcoholic.

Of the other causes of misty vision, cataract and simple glaucoma were mentioned as the commonest.

Cataract is eliminated by the examination of the eyes in the dark room. The fundus of the eye is brightly lighted up by the retinoscopy mirror, showing either a uniform reddish colour, or enormously magnified, and perhaps blurred details of the retinal vessels, or disc, against which any cataract stands out sharply and black. No other method of diagnosing cataract is unfailing, and without it mistakes can be easily made, as in a case of pure tobacco amblyopia who came with the diagnosis "Cataract and 2D of Hypermetropia."

CASE 6.—S. P., 54, labourer. November 22, 1898: R. $\frac{5}{60}$, *cum* + 2 = $\frac{5}{36}$; L. $\frac{5}{36}$, not improved. "Cataract and 2D of Hypermetropia," a mist before eyes four months, gets thicker; no cataract; no pain; tension normal; colour scotoma. Retinoscopy, + 1D R. and L. November 18, 1899: attends irregularly; will not give up smoking, R. and L. $\frac{5}{24}$. September 22, 1900: R. and L. $\frac{5}{36}$; smoking. December 22: $\frac{5}{36}$; stopped smoking. March 30, 1901: R. *cum* glass = $\frac{5}{12}$; L. *cum* glass $\frac{5}{9}$; still minute scotomata.

The wrong diagnosis of cataract may be serious. An old lady came up one afternoon who, with clear lenses, simple glaucoma, and the diagnosis of cataract, had been allowed to go on first in one eye and then in the other to total and incurable blindness. It is common experience that clear lenses are not infrequently found in the dark room, where from external appearance there is every justification for expecting cataract.

Cataract was present in four of these cases, two had had it extracted, without corresponding results, and then enquiry led to

tobacco excess being found. In one the failure of vision was greater than the cataract accounted for.

CASE 7.—T. S., 63, grocer. March, 1901: V., R. $\frac{5}{36}$; L. $\frac{5}{60}$, not improved; advancing senile cataract both, but fundus well seen and normal. Smokes three ounces black shag weekly. Colour scotoma for red in both, for green in the left, but green well recognised by the right.

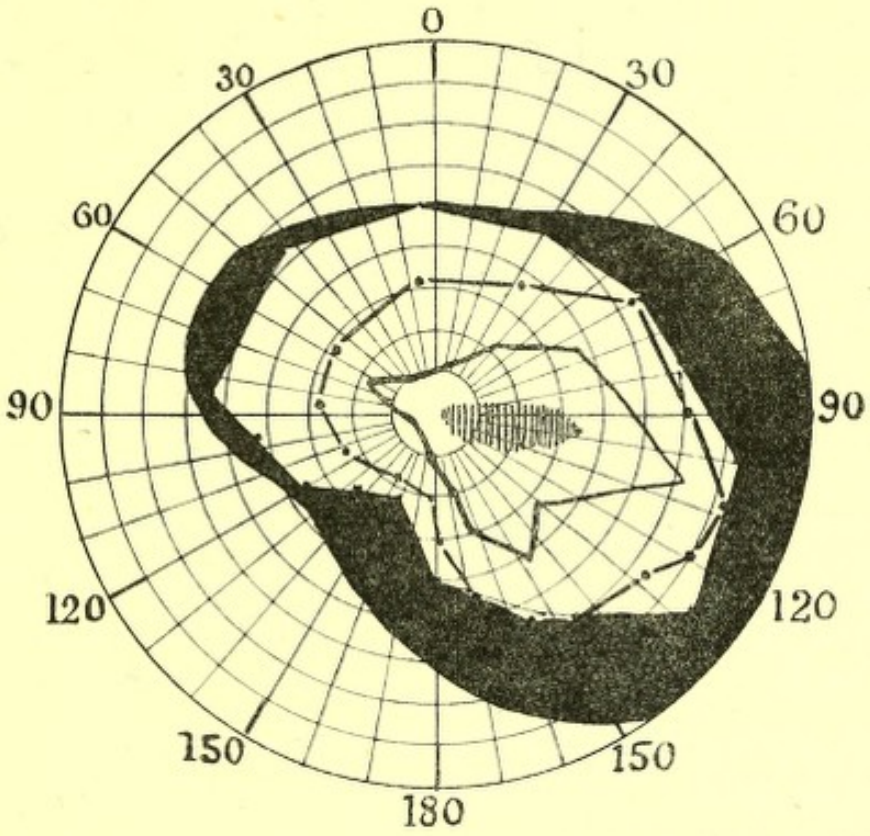
The next likely cause for failing vision was simple glaucoma. The graphic word pictures, and striking clinical character of what are comparatively rare cases, those of acute glaucoma, are so impressed on the memory that it is difficult to realise that most cases of glaucoma go on insidiously, and are so difficult to be certain about that they must always be the subject of mistakes. There may be no pain, no excess of tension, no dilated pupils, but yet in any middle-aged or elderly person with eye complaints glaucoma must be suspected until it is negatived. Distinction from tobacco amblyopia should always be easy, as in glaucoma great failure in central vision does not often occur without considerable peripheral contraction of the field, and again, there is rarely any of the difficulty with colours that results from tobacco. The combination of glaucoma and tobacco amblyopia is to be remembered, and glaucoma may actually be a predisposing cause, as in Case 8.

CASE 8.—M. K., 49, warp dresser. October 20, 1900: R. $\frac{5}{18}$, not improved; L. $\frac{5}{6}$ no Hm. "Pain in right eye and it is left a bit dull." Tn. pupil a trifle oval, no decided account of glaucomatous symptoms, no cupping. Refraction emmetropic. Fields not typical, a trifle contracted. Central colour scotoma in R., not in L. Smokes two ounces at least weekly for past twenty years. Gutt. eserin. February 9: on careful testing a central scotoma for red but not for green can be got in left eye too. March 16: V., R. $\frac{5}{9}$, L. $\frac{5}{5}$; colour scotomata gone in both.

Glaucoma was certainly present in seven of these cases and in two iridectomy was done. In Case 9 the post-operative improvement in the peripheral extent of field was so great that other causes had to be looked for to account for the failure in central vision, and tobacco was then detected.

CASE 9.—J. W., 60. January 12, 1901: Sub-acute glaucoma. Violent arterial and venous pulse on both discs, some cupping. T. + 2. Contracted fields; R. $\frac{5}{60}$ *cum* + 2 = $\frac{5}{36}$; L. $\frac{5}{60}$ not improved. January 14: L. iridectomy. January 16: R. iridectomy.

January 30: Increased field. R. $\frac{5}{36}$; L. < $\frac{5}{60}$. February 9: Field further increased. Smokes half an ounce daily. Green = "white"; red = "gold." February 23: R. $\frac{5}{24}$; L. $\frac{5}{60}$. Referred to his own doctor.



Diag. II. *Right Field of Case* 9.—Continuous line field when first seen; broken line field fortnight after iridectomy, while outline of field three weeks after is shown on black normal field. The scotoma for red then found is shaded vertically.

The toxic effects on the eye from years of the tobacco habit are not associated with the acute symptoms on digestive system or heart muscle seen in those who are unhardened in smoking.

Besides glaucoma and cataract, which, like alcohol, may be mere associations, hypermetropia, which occurs too frequently to be accidental, there are other associations generally of a debilitating nature. In one, Case 10, a blow on the eye seemed to cause the onset, and that eye was the worst.

Case 10.—J. N., 46, pavior. R. $\frac{5}{36}$ *cum* + 1 = $\frac{5}{24}$; L. $\frac{5}{18}$ *cum* + 1 = $\frac{5}{9}$. November 17, 1900: Had a blow on left eye a week ago, eye may have been weak before. R. disc pale and atrophic-looking; L. rather pale. Retinoscopy, R. + 1·5; L. + 2. Smokes four ounces weekly. Right, red = "brown"; green = "white." Left, red = "red"; green = "blue."

Another case was debilitated, although smoking little.

CASE 11.—F. W., 37, weaver. June 30, 1900: R. $\frac{5}{36}$, not improved; L. $\frac{5}{60}$ *cum* + 1 = $\frac{5}{36}$. One month failure of sight, smokes one and a half ounces twist; no marked scotoma. Tremulous tongue. Retinoscopy, R. + 1·5; L. + 2. Left disc very white. Off work since Christmas with chest disease.

Another case, with stomach trouble debilitating her, was remarkable as being in a woman, the small amount of tobacco consumed, and the speedy onset within a year. Nettleship records one case which occurred after a year of smoking.

CASE 12.—H. S., 62, housewife. "Mist and glimmering over eyes, health not good for six months." May 27, 1899: R. and L. fingers at 2 metres wears + 4·OD sphs. Knee-jerks and pupils normal, no cupping of discs, normal. November 4: ("First time seen"—J. K.). R. *cum* + 1·5 = $\frac{5}{60}$; L. *cum* + 1·5 = $\frac{5}{24}$. Central colour scotomata, smokes one and a half ounces weekly dark shag, "for stomach sake," has done so nearly a year. Stop smoking. Strychnine. January 2, 1900: V., R. and L. *cum* + 1·5 = $\frac{6}{18}$. March 24: Colour scotomata gone. April 28: V., R. and L. *cum* + 1·5 = $\frac{6}{9}$. Glasses ordered.

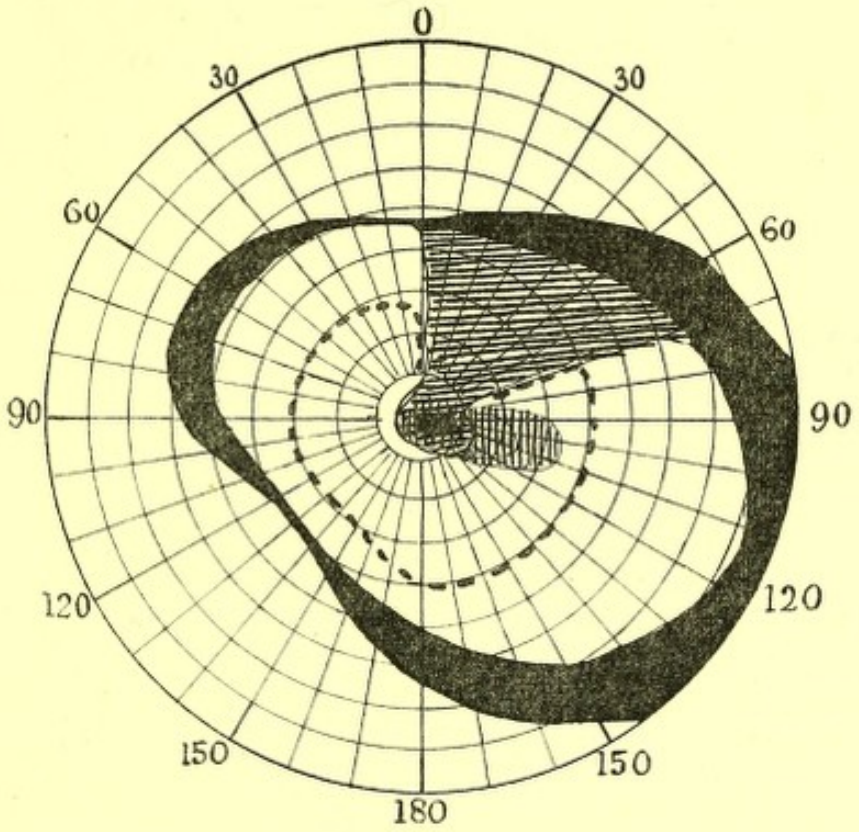
Relapses are rare, but in one case occurred after influenza; so, too, in Case 16.

CASE 13.—G. W., 40, weaver. April 1, 1899: R. $\frac{5}{36}$ *cum* + 3 = $\frac{5}{18}$; L. $\frac{5}{18}$ *cum* + 3 = $\frac{5}{12}$. Retinoscopy, R. + 6; L. + 4·5. No improvement over glasses worn. April 15: No pain, "eye dithers," no marked scotoma. Smokes twist up to six ounces weekly. November 24: *Stat. quo*. Not given up smoking. No contraction of field. December 23: Not smoked for a month. R. *cum* + 5 = $\frac{5}{12}$; L. *cum* + 4 = $\frac{5}{12}$. March 4, 1900: Worse. R. $\frac{5}{24}$; L. $\frac{5}{24}$. Has had influenza. July 7: R and L. *cum* glass = $\frac{5}{6}$. Quite given up smoking.

In another case the fields of vision present two lesions overlapping. A slight stroke eighteen months ago has left the upper and right quadrants amblyopic, but there are large central scotomata for colours. For two years he has smoked half an ounce daily, and were the lesion entirely central the outlook would be bad, but in reality considerable visual improvement is to be expected.

CASE 14.—W. G., 62, retired railway clerk. February 11, 1901: R. < $\frac{5}{60}$. Improved by + 4? L. < $\frac{5}{60}$. Improved by + 5? Had a kind of stroke, "spasm and unconsciousness," eighteen months ago, vision failing since. No pain. Smokes one ounce daily

threepenny mixture. "Cannot read a letter of the newspaper; occasional illusion of a blaze." Marked colour scotomata; does not see better at dusk. Some cupping, not marked. Pallor of outer halves of both discs. Retinoscopy, R. + 3; L. + 3, + 5. March 20: Still "steals a pipe" at times. Vision R. and L. $\frac{5}{24}$. Scotomata much less marked. May 1: "Can make out newspaper a bit."



Diag. III. *Right Field of Case* 14.—White in black area, which is normal field, periphery of red field dotted. Vertical shading red scotoma, due to tobacco; horizontal shading the amblyopic area, due to cerebral lesion.

The treatment is to stop all use of tobacco, chewing, snuffing, or smoking. The vision may deteriorate for a week or ten days, as in following case of rapid failure and slow recovery.

Case 15.—A. H., 50. V., R. = $\frac{6}{36}$, not improved; L. $\frac{6}{24}$, *cum* + 1 = $\frac{6}{18}$. April 14, 1900: "Sight failing for seven weeks." No pain. Smokes and chews half an ounce daily. Retinoscopy, R. and L. + 1·5. Stops smoking. April 28: Much worse; objects dazzle now. Central scotomata not marked; arteries small and doubtfully atrophic. May 12: R. $\frac{5}{24}$; L. $\frac{5}{18}$. June 30: R. $\frac{6}{18}$; L. $\frac{6}{18}$. August 4: R. $\frac{9}{12}$; L. $\frac{6}{12}$. February 23, 1901: R. $\frac{5}{9}$; L. $\frac{5}{9}$. March 9: R. $\frac{6}{6}$; L. $\frac{6}{6}$. Still smokes a very little, "half an ounce a week."

It should soon begin to improve, and in two months very definite improvement should have taken place. It may be expected to continue for months, and possibly be hoped for

up to six months at least. Strychnine appears to hasten the improvement, it is said also to relieve the desire for tobacco, to relieve which some have proposed nicotine free tobacco. Some, but very few, may, if it be due to debilitating causes, improve without discontinuing the tobacco, the improvement depending on general health. Others go on using the weed and get no worse, as in the following case, who relapsed after influenza.

CASE 16.—R. L., 49, joiner. January 12, 1895: R. $\frac{5}{18}$, not improved; L. $\frac{5}{36}$, *cum* + 2 = $\frac{5}{18}$; retinoscopy R. + 4; L. + 3·5 + 5; colour scotomata; smokes half an ounce of shag daily. February 9, 1895: R. and L. $\frac{5}{12}$. July 23, 1898: Trouble again with vision, R. and L. $\frac{5}{24}$; has had influenza. October, 1898: R. and L. $\frac{5}{12}$. November 10, 1900: Smokes one ounce weekly; R. and L. *cum* + 5 = $\frac{5}{5}$.

Or reducing the tobacco may only give a slight improvement, and then the amblyopia remain stationary.

CASE 17.—B. W., 61, wood-turner. July 7, 1900: R. < $\frac{5}{60}$ *cum* + 1·5 = $\frac{5}{60}$; L. $\frac{5}{60}$ *cum* + 1·5 = $\frac{5}{36}$. Mist over eyes, dim for near work; small colour scotoma; smokes two to three ounces weekly; field normal periphery. Retinoscopy, + 1·0 D. March 13: R. $\frac{5}{36}$; L. $\frac{5}{60}$. Smokes one and a half ounces weekly. Some cupping both discs; colour scotoma present.

Possibly a few who continue to smoke may go on to atrophy as a permanent change.

CASE 18.—S. B., 58, engineer. R. and L. < $\frac{5}{60}$, not improved. "Cannot see to read"; central colour scotoma; atrophic discs; knee-jerks and pupils normal. Only one and a half ounces tobacco now, formerly excess. R. + 2·5 D with + 5 D Astig; L. + 5. May 23: *Stat. quo.*

It is well to be particular to look for tobacco blindness and exclude it, especially when other complications are present, which might easily lead to its being overlooked, because, where so masked, a hopeless prognosis may be given, when, by its detection, rapid improvement is likely to be got to the satisfaction of both doctor and patient.

TABLE OF OTHER CASES REFERRED TO IN THE TEXT.

No.	Initials. Age. Occupation	Complaint. Weekly Tobacco	First Vision Noted	Average Refraction	Fields	Last Vision Noted	Remarks. Duration of Observation
19	J. S., 60, weaver	Failing vision. 4 ozs. to 5 ozs. dark shag	R. $\frac{5}{60}$ L. $\frac{5}{60}$	— 1·5 D.	Central red scotomata	$\frac{5}{36}$ $\frac{5}{60}$	Three weeks.
20	J. B., 48 ...	Bad vision twelve months. Over 2 ozs.	2 metres / fingers	...	Central red scotomata	...	Very tremulous.
21	B. B., 37, dyer's labourer	Cannot see to read for two months. 3 ozs.	$\frac{6}{36}$ < $\frac{6}{60}$	...	Central red scotomata	...	Two weeks.
22	C. D., 52, dyer...	All is dim; no pain. 4 ozs. T = + 1	2 metres / fingers	Sees better at dusk	Central red scotomata	Shadows $\frac{5}{36}$	Iridectomy for glaucoma.
23	M. K., 52, stone-mason	Going blind. 1 oz. daily; smokes and chews	$\frac{5}{24}$	Emmetrop	Central red scotomata	...	Not seen again.
24	T. C., 63, leather dresser	Golden yellow affects the eyes; six months bad. 4 ozs.	< $\frac{5}{60}$	...	Central red scotomata	*Stat. quo.*	Will not give up smoking. Two years.
25	J. D., 48, card cleaner	3 ozs. honeydew	< $\frac{5}{60}$	...	Central red scotomata	$\frac{5}{60}$	Two months.
26	J. B., 48, cloth stiffener	Failing vision. 4 ozs. honeydew	< $\frac{5}{60}$	...	Central red scotomata	$\frac{5}{24}$ $\frac{5}{36}$	Discs somewhat atrophic. Two months.
27	R. H., 64, carpet weaver	Like a mist both near and far. 2 ozs. Tn.	$\frac{5}{24}$ $\frac{5}{24}$	— 2·0 D.	Central red scotomata	$\frac{6}{12}$ $\frac{6}{18}$	Outer halves of discs white. Two months.
28	J. B., 33 ...	Cannot read paper lately. ½-oz. daily	$\frac{5}{60}$ $\frac{5}{36}$	+ 1·5	Very marked scotomata	$\frac{5}{12}$ $\frac{5}{18}$	Tremulous tongue. One month.
29	H. C., 50, joiner	Cannot see to read. Smokes much	$\frac{6}{24}$ $\frac{6}{9}$	+ 0·5	Well marked red scotoma in R., not in L.	$\frac{6}{9}$ $\frac{6}{6}$	Still smokes about ½-oz. weekly. Seven months.

TABLE OF OTHER CASES REFERRED TO IN THE TEXT.—*Contd.*

o.	Initials. Age. Occupation	Complaint. Weekly Tobacco	First Vision Noted	Average Refraction	Fields	Last Vision Noted	Remarks. Duration of Observation
30	E. N., 43, miner	Cannot see well past two months. 4 ozs.	fingers $\frac{6}{60}$	+ 1·0	Marked scotomata ...	$\frac{6}{24}$ $\frac{6}{24}$	Smokes ½-oz. now. Three months.
31	J. N., 54, labourer	Mist in front of eyes for six weeks; came suddenly. 3 ozs. shag	< $\frac{6}{60}$	+ 1·5	Marked scotomata ...	$\frac{5}{5}$	No scotoma now. Two months.
32	J. H. L., 49, platelayer	Poor vision. 2½ ozs. smoked	$\frac{5}{12}$ $\frac{5}{9}$	+ 4·0	... ...	$\frac{5}{6}$	Improvement only on giving up tobacco. Fourteen weeks.
33	H. T., 48, dyer...	Vision gone last week or two. 4 ozs.	$\frac{5}{60}$	...	Marked scotomata ...	...	Outer halves of discs white. Not seen again.
34	A. H., 37, engine tender	All misty, and in the daytime a brilliant blaze. Smoked much till recently	$\frac{5}{36}$ $\frac{5}{18}$	+ 1·5	Marked scotomata. Medullated nerve fibres in L.	$\frac{5}{6}$ $\frac{5}{6}$	General shakiness of head and hands. Four months.
35	A. M., 46, labourer	Eyes bad nine months. ½-oz. daily. T + ?	$\frac{6}{60}$ $\frac{6}{24}$	...	Scotomata for red and green	$\frac{5}{6}$ $\frac{5}{6}$	Three months.
36	H. J., 42, carrier	Cannot read papers. 3½ ozs. cut cake	$\frac{5}{60}$ $\frac{5}{36}$	+ 1·0	Well-marked scotomata	$\frac{6}{9}$	Six months.
37	R. S. M., 50, collector	Poor eyesight. At least ½-oz. daily	$\frac{5}{18}$ $\frac{5}{18}$	+ 2·0	... ...	$\frac{6}{9}$	Cataract in both. One month.
38	W. K., 53, warp dresser	2 ozs.	$\frac{6}{12}$	+ 5·0	Red scotoma, but not green	$\frac{6}{9}$	One month.
39	W. S., 46, weaver	5 ozs.	$\frac{5}{18}$ $\frac{5}{18}$	+ 2·5	Scotomata not well marked, pale discs	$\frac{6}{9}$ $\frac{6}{9}$	Two months.
40	E. F., 68, shoemaker	Not improved sufficiently after operation. ½-oz. twist daily	p. l.	Aphakia	Scotoma (?)	...	Not seen after cataract operation

41	J. C., 65 ...	Not improved sufficiently. ½-oz. smoked	p. l.	Cataract operation	Colour scotoma ...	$\frac{5}{12}$	Very little smoked now. Four months.
42	W. T. T., 38, retired	Cloudiness, and sees better in dusk. 4 ozs. and cigars	$\frac{6}{24}$ $\frac{6}{24}$	Emmetrope	Colour scotoma ...	$\frac{6}{12}$ $\frac{6}{9}$	Four months.
43	T. Y., 58, tailor	Eyes have gone altogether in last couple of months. 3 ozs. strong twist	< $\frac{6}{60}$	... ...	Marked colour scotomata	$\frac{6}{24}$ $\frac{6}{12}$	Red scotoma still. One month.
44	M. P., 56, labourer	Rather better than ½-oz. shag a day	$\frac{5}{60}$ $\frac{5}{24}$	+ 1·0	Marked colour scotamata	$\frac{5}{9}$ $\frac{5}{9}$	No colour scotoma after twelve months. Eighteen months.
45	J. S., 43, warehouseman	Cannot see in the mornings. ½-oz. daily smoke	$\frac{5}{18}$ $\frac{5}{18}$	+ 3·5	Red but not green scotomata	$\frac{5}{9}$ $\frac{5}{6}$	Smokes ½-oz. now. Narrowed arteries. One year.
46	T. E., 65, weaver	Eyes gone dim last three months. 3 ozs.	< $\frac{5}{60}$ $\frac{5}{60}$	+ 1·0	... ...	$\frac{5}{9}$ $\frac{5}{9}$	Three months.
47	B. W., 61, wood turner	Mist over eyes, very dim for work. 3 ozs.	< $\frac{5}{60}$ $\frac{5}{60}$	+ 0·5	Small colour scotomata	$\frac{5}{36}$ $\frac{5}{60}$	Continues 1½ ozs. Small red scotoma remains. Nine months.
48	C. S., 40, tailor	Sight failed last few months. Smokes 2 ozs. cut cake; chews also	$\frac{6}{36}$ $\frac{6}{60}$	— 5·0	Small colour scotomata	$\frac{5}{9}$ $\frac{5}{9}$	Smokes ½-oz. now. No colour scotoma now. Eight months.
49	H. B., 30, miner	Has miner's nystagmus. 5 ozs. honeydew	$\frac{5}{60}$ < $\frac{5}{60}$	+ 7·0	Scotomata in R., not well marked in L.	...	Not seen again.
50	R. F., 60, tailor	Poor vision. 3 ozs.	$\frac{3 \text{ metres}}{\text{fingers}}$	+ 8	Scotomata well marked	$\frac{5}{36}$	Six weeks.
51	J. H. R., 46, carrier	Cannot see well lately. 7 ozs. twist	$\frac{6}{24}$ $\frac{6}{60}$	... ...	Marked red and green scotomata	...	Not seen.