

**M.D. Thesis**  
**on**  
**Tobacco Amblyopia**  
**by**  
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## Tobacco Amblyopia.

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### Etiology and History.

Tobacco amblyopia is an affection of the vision due to the abuse of tobacco. It is not uncommon, and generally met with in men between the ages of thirty and sixty. Out of twenty-two cases observed by me, when Clinical Assistant at the Royal London Ophthalmic Hospital only one patient was under thirty - he was twenty years of age.

In 1863, Desmarres the Elder, Sichel, and MacKenzie were the first to draw attention to Amblyopia following the abuse of tobacco. Hutchinson in 1866, and Wordsworth and others have since written on the subject. Von Graefe in 1865 showed very clearly the differences between progressive Amblyopia with restriction of the field, and curable Amblyopia with normal periphery of the field, but with a central defect - a central scotoma. All observers agree that the complaint is almost exclusively confined to males, though Hutchinson mentions one of Kronldgein two cases in the female. One of the latter's cases had smoked and chewed tobacco for the purpose of alleviating a cough; while the other had smoked three pipes of strong tobacco daily for some years.

Tobacco Amblyopia is more common in Great Britain than on the Continent. In Germany and Turkey the tobacco is very

light and contains comparatively little nicotine when compared with English tobaccos.

Galezowski maintains that there are two forms of Amblyopia:-

1<sup>o</sup>. Binocular - with no lesion of the internal coats of the eye, and differing in no respect from alcoholic Amblyopia.

2<sup>o</sup>. Monocular - taking the form of a central scotoma, which sometimes extends over the whole field and may lead to total blindness. He considers, however, that the sight may in some cases return in a slow and progressive manner. He also thinks that the true tobacco form is often confounded with the alcoholic, in which the failure is binocular, gradual and simultaneous in both eyes. The very frequent co-existence of excess in the use of alcohol with indulgence in tobacco renders it extremely difficult to make such a fine distinction between the two. Förster says, and I agree with him, that, if passionate smokers become amblyopic, and improve when the use of tobacco is given up, it is clearly proved that they were true cases of tobacco Amblyopia. Hutchinson considers that alcohol counteracts the effects of tobacco; on the contrary, I believe it renders smokers more liable and predisposed to the toxic effects of tobacco.

How much tobacco is it necessary to smoke to cause diminished acuteness of vision? This question is very difficult to answer. Sichel is of opinion that very few people are able to smoke more than twenty grammes per day without their vision and their memory becoming weakened. Many men smoke more than an ounce a day, so that I think tobacco Amblyopia would be much more common than it is if Sichel's estimate were correct. Some seem able to resist the toxic effects of large doses of tobacco, whilst others are peculiarly sensible to its action even in small quantities. Amongst the cases which came under my observation only two smoked less than a quarter of an ounce daily, the others all smoking one ounce or more in the same time. All my patients were in the habit of smoking pipes, some of them taking an occasional cigar in addition. I have never seen a case result from tobacco chewing - the active principles being apparently spat out.

A number of the patients smoked in the morning while fasting, and this circumstance is certainly favourable to the absorption of the poison. In some cases the food had been bad and insufficient in quantity; others had been mentally and bodily worried; but many were strong and robust men.

#### Symptoms

##### 1<sup>o</sup>. Amblyopia.

The most important symptom, and that which troubles the

patient most is the diminished acuteness of vision. This enfeeblement comes on slowly and gradually. The Amblyopia is often slight, at other times very marked. I have seen it reduced to seeing fingers with difficulty. The two eyes are simultaneously affected; sometimes the acuteness undergoes an equal reduction in the two eyes, at other times there is a difference more or less marked, but which is never considerable.

The appearance of the Amblyopia is not preceded by any sign which enables us to foresee its occurrence.

Patients compare the defective vision to a mist, which is worse in the early morning and in a bright light. When the patient is reading a veil seems to cover the letters looked at. One man compared the defect to "rings of sparks revolving;" others compared it to snow falling and fluttering before the eyes. As the vision improved, these illusions disappeared. Two patients stated that they were constantly enveloped in a kind of clear mist like tobacco-smoke. This mist, like the illusions already mentioned, gradually clears off as the vision is becoming normal.

2<sup>o</sup>. Central. Defects in colour perception;-

The colours first lost or imperfectly seen are the green and the red, then follow the blue and the violet. Yellow is best seen. The red is generally mistaken for a

shade intermediate between the red and the yellow; at other times it appears brown. When the object is placed away from the fixation point, patients will generally see a shade of red. In cases where the Amblyopia is slight and when the red is looked at directly it may be doubtfully recognised; but, when placed away from the fixation point, the colour is better defined. The green is generally mistaken for white, but away from the fixation point it is well recognised. Blue and violet generally take on a greyish hue, more or less of their true shade. Violet is often confounded with the blue but it is recognised away from the fixation point. This perversion of the colour sense is constantly met with, and persists long after the amblyopia has disappeared.

### 3. State of the Field of vision:-

The field of vision is generally maintained in a state of almost absolute integrity.

### 4. Relative Scotoma:-

Förster described this symptom. The white loses more or less of its whiteness. In searching for these scotomata, great care must be exercised and we will often find regions in the fields in which the white is obscured. I have never failed to find this scotoma when carefully looked for, and regard it as peculiar to and characteristic of tobacco Amblyopia. Then scotomata may occupy only a small circumscribed spot, or

cover the whole field of vision. When circumscribed they are generally of a round or oval shape. Their position is variable though generally at or near the fixation point. These scotomata are not sufficiently well marked for the patient to perceive them himself. These scotomata may still be found <sup>und</sup> ~~and~~ after the acuity of vision has become almost normal; but as a general rule, they recede gradually in all directions as the amblyopia lessens.

#### 5. Ophthalmoscopic signs:-

In most of the cases there is a well marked pallor of the discs, especially in the <sup>outer</sup> ~~inner~~ halves. The vessels are nearly always normal. In one case there was general pallor of the discs with slightly contracted vessels. The discs, on the other hand, may appear slightly injected and their outlines obscured; while in many cases, I have been unable to detect any change at all. In one case even after the vision had become normal, the central vessels were markedly reduced in calibre; but, as a general rule, when normal vision is being re-established, the ophthalmoscopic changes disappear by degrees.

#### Diagnosis:-

The almost perfect <sup>integrity</sup> ~~integrity~~ of the fields, the correspondence of the scotomata in the two eyes, and the colour perversion, render the diagnosis easy. In atrophy of

the optic nerve, which is the affection apt to be mistaken for tobacco Amblyopia, there exists with a diminution in the calibre of the central vessels, a white steel-grey shining appearance of the discs not met with in tobacco Amblyopia. Besides, when the atrophy is advanced, a cupping of the discs is easily recognised. When the Amblyopia has become evident, the field of vision in atrophy of the optic nerve is always contracted. Scotomata are also found in optic nerve atrophy, but they never so exactly correspond in the two eyes as in tobacco cases; and the colour defects which are found are identical either when the patient directly fixes the object or when it is placed away from the fixation point.

Prognosis:-

It has been stated that tobacco Amblyopia may lead to total blindness, but I believe that when the use of tobacco has been given up, complete normal vision will return in a longer or shorter time. If the Amblyopia has been considerable and already lasted a long time, it will be well in general to allow a long time, often six or twelve months or more, for the acuity of vision to return to its normal condition.

Treatment:-

The treatment consists essentially in abstention from tobacco. In my opinion the use of alcohol in any form should also be given up. Attend to general health - good food, and

fresh air - Tincture of nux vomica may be given, or strychnine injected hypodermically to act as a nerve tonic. The continuous current in old standing cases is a valuable addition to general treatment. Rest to the eyes is also indicated, and protective glasses may be worn.

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Clinical Cases:-

I. J.W. Age 58. Clerk. Complained of dimness of sight - unable to read the newspapers, and constantly imagined he saw snow falling. General health good. Smokes half an ounce of tobacco daily. Very temperate.  $V = \frac{20}{30}$  in both eyes. No H.m. On careful examination with Priestley Smith's perimeter I detected well marked relative scotomata above and to the right of the fixation point in both eyes. These scotomata did not measure more than 10 c. c. in their greatest diameter.

Green, when fixed directly, appeared to have a greyish tint, but, had more of its true colour away from the fixation point. The red looked dark brown at the fixation point, but was well recognised when placed away from it.

The yellow and the orange were well recognised, but appeared of a brighter tint when placed away from the fixation point.

The fields were normal.

Ophthalmoscope. Well marked pallor of the outer halves of both discs.

Treatment.

Abstention from tobacco and alcohol. Hypodermic injection of strychnine ( $\frac{1}{100}$  Gr.) into the temple, and the continuous current once a week.

In six months his V. was almost normal, and he could read

I 1. at 12 in. with his Presbyopia corrected. No evidence of relative scotomata and central colour perception good.

II. M.R. Age 44. Tailor. Complained of sight failing for nearly a year. Robust man. Heavy smoker.  $V. = \frac{20}{70}$  Small angular scotomata pointing towards the fixation point. The green and the red were not recognised centrally, but, away from the fixation point both colours were well perceived.

Fields normal.

The ophthalmoscope showed pallor of the outer halves of both optic discs.

Treatment.

No tobacco. Quinine mixture. A month later his vision was worse, but he stated that he had been smoking and drinking. In three months with abstention from both his  $V.$  was  $= \frac{20}{40}$  and steadily improving.

III. J.M. Age 52. Shoemaker. Complained of rapidly failing sight for five months. Could not read the newspapers and noticed that his sight was worst in the early morning.

$$V. = \frac{20}{70}$$

Large scotomata occupying nearly the whole of the fields below the horizontal meridian. Smokes half an ounce of tobacco daily, and often takes a pipe when fasting in the morning.

He called green, white, and red, yellow. When placed away from the fixation point both colours were well recognised. The violet was confounded with the blue.

The fields appeared to be a little contracted in the vertical meridian. The optic discs looked normal.

Treatment.

No tobacco. Quinine mixture with tincture of nux vomica

In two months the V. was  $\frac{20}{40}$

Patient lost sight of.

IV. M.F. Age 43. Labourer. Complained of a mist before his

eyes. Heavy smoker and drinker. V. = L.  $\frac{20}{70}$ , R.  $\frac{20}{50}$ . <sup>No H<sub>2</sub>O.</sup> Emmetro-

pic. In good health, but during the past year has sometimes felt giddy and been obliged to sit down to prevent himself from falling. Careful examination enabled me to detect a small scotoma in either eye, but the patient was confused and stupid, rendering it difficult to make an observation.

The green and the red were only recognised in the outer part of the field.

Ophthalmoscope showed exaggerated pallor in the outer halves of both discs.

Fields apparently normal.

Treatment.

No tobacco and no alcohol.

Mixture of nitro-muriatic acid, strychnia and gentian.

In one month V. =  $\frac{20}{40}$ .

Two months later V. =  $\frac{20}{30}$  slowly.

Patient now declares that he will never smoke or drink again.

V. M. S. Age 43. Tinman. Complained of dimness of sight. Noticed that his sight suffered if he smoked more than his usual quantity of half an ounce a day. Heavy drinker. A clear white mist seemed to cover everything he looked at.

V. = R.  $\frac{20}{100}$  L.  $\frac{20}{70}$

Small scotoma in both eyes reaching almost to the fixation point.

The green looked white at the fixation point; away from it, <sup>it</sup> was well recognised.

The red, directly fixed appeared dark yellow; in the periphery of the field it looked a good red.

The violet and the yellow were well seen; but, away from the fixation point they had a brighter tint.

The fields were normal.

The ophthalmoscope showed pallor of the outer halves of both discs.

#### Treatment.

Abstention from tobacco and alcohol, with a 'placebo'.

In one month his V. was no better, Patient still smokes.

In 2 months his V. was  $\frac{20}{70}$  in both eyes. Has given up

smoking. In 2 months more V. =  $\frac{20}{40}$ . Patient thinks tobacco did him harm.

VI. M. D. Age 46. Carpenter. Complained of dimness of sight. General health good. Smokes half an ounce of Shag tobacco daily. Very temperate.

V. =  $\frac{20}{70}$  in both eyes.

Below, and to the right of the fixation point, I found a small oval scotoma about 3 c. c. in its greatest diameter.

Green, when fixed directly looked white; towards the periphery of the field it became greenish white. Red appeared to him dark yellow, but, when placed away from the fixation point it had more of its true colour.

The fields were normal.

The ophthalmoscope showed pallor of the outer halves of both discs.

#### Treatment.

No tobacco - quinine mixture with strychnia. Patient did not return.

VII. J. C. G. Age 52. Complained of his sight failing for some time. Intemperate man. General health appears good. Says he often smoked in the mornings when fasting, and during the night when he could not sleep. He remarked that the faces of his companions appeared to him pale, and seemed to be enveloped in a mist. Smokes half an ounce of tobacco daily.

V. R. =  $\frac{20}{100}$ , L. V. =  $\frac{20}{70}$ .

In the R. eye there is an oval scotoma to the right of the fixation point measuring 6 c. c. in its greatest diameter. In the L. eye the scotoma is circular and measures 14 c. c. in its greatest diameter.

The fields are normal.

The green appeared grey at the fixation point, but, away from it, it had more of its true colour. The red looked yellow like the skin; away from the fixation point it looked a good red.

The orange, yellow, and the blue were well recognised, but, left a painful impression on the eyes.

The ophthalmoscope showed well marked venous congestion of both discs.

#### Treatment.

No tobacco and no alcohol. Mixture of iron and iodide of potass.

In a month there was no appreciable improvement. To have quinine mixture with strychnia. Patient did not return.

VIII. A. M. Age 48. Artist. Always had good sight until recently, when he noticed that a bright light fatigued his eyes and every object that he looked at seemed to be enveloped in a mist. Smokes about half an ounce daily. V. =  $\frac{20}{50}$  in both eyes. Small scotoma in both eyes near the fixation point.

The green and the red were not recognised when fixed directly, but, away from the fixation point they had more or less of their true colour. The fields were normal.

The ophthalmoscope showed nothing abnormal in the fundus

Treatment.

No tobacco. Quinine mixture. 2 months later his V. was  $\frac{20}{40}$ . In 6 months his V. was  $\frac{20}{20}$ . He could now recognise the green and the red when placed on the fixation point, but, towards the periphery of the field they had a brighter tint.

Declares he will never smoke again.

IX. P.J. Age 52. Jeweller. Sight had been failing for a year. One morning he took a newspaper he had been reading the night before and found that he could not read it. Smokes a quarter of an ounce daily.

$$V. = \frac{20}{200}$$

To the right and below the fixation point there is an oval scotoma of 12 c. c. in its greatest diameter. The green and the red were not recognised at the fixation point. Blue, orange, violet and yellow were well seen at the fixation point

The ophthalmoscope showed pallor of the outer halves of both discs.

Treatment.

Abstention from tobacco. Mixture of strychnia and infusion of quassia. In two months V. was  $= \frac{20}{70}$ . Four months lat-

er V. was =  $\frac{20}{40}$  and steadily improving.

- X. G.H. Age 43. Complained of sight failing for four or five months. Worst in a bright light, and accompanied by pain in the temples and forehead. General health good. Lived well and regularly. Smokes half an ounce of cut Cavendish tobacco, and drinks a few pints of beer daily.

V. R. =  $\frac{20}{100}$ , H.m. J.D. L. =  $\frac{20}{70}$ , H!m. J. 5 D.

Central scotoma for green and red.

Fields normal.

The ophthalmoscope showed nothing abnormal.

In two months his V. was R.  $\frac{20}{40}$ , L.  $\frac{20}{30}$ .

Has not entirely given up the use of tobacco and alcohol, but has now determined never to touch either again.

- XI. W.H. Age 30. Complained of being unable to see in a bright light, and lately of not being able to read the newspaper. The left eye was the first to fail. Has always lived an irregular and dissipated life. Smokes half an ounce of Shag tobacco, and drinks about 20 glasses of beer daily. V. R. = J 19. L. = fingers with difficulty.

Central scotoma for green and red. Both discs pale specially towards the temporal sides.

To have bichloride of Mercury and Iodide of Potassium, there being a specific history.

Two months later he complained greatly of occipital

headache and sleeplessness. To have bromide of potassium and chloral.

Two weeks later he again presented himself complaining that his sight was getting gradually worse. Occipital and frontal headache still severe. Knee jerks normal. Stands steady with feet placed close together. Has continued to use tobacco and alcohol freely. After marriage he indulged in excessive sexual intercourse. V. R. = fingers at 18 in. L. = fingers at two feet.

Advised to give up smoking. Allowed one pint of beer, and to have continuous current daily. Five months later he could distinguish the pattern of a shawl.

V. R. = J 20  
L. = J 19

To have mixture containing nux vomica.

Calls green pink and pink white. Has the illusion that snow is continually falling. Two weeks later he recognised the green.

V. R. =  $\frac{20}{200}$   
L. =  $\frac{20}{200}$

Two months later the ophthalmoscope showed moderately advanced atrophy of both discs. Vessels about normal. No galvanic sensibility with all the cells. Knee jerks somewhat exaggerated.

V. R. =  $\frac{20}{50}$

One month later V. R. and L. =  $\frac{20}{40}$  and with + 1 D =  $\frac{20}{20}$  slowly.

Colour ~~and~~ vision still defective. To have mixture of quinine. Five months later V. R. and L. =  $\frac{20}{20}$  and with + 1 D = J. 1 badly.

To have mixture containing nux vomica, iron, and cinchona.

Twelve months later patient returned and said his sight was worse again.

$$V. R. = \frac{20}{30}$$

$$L. = \frac{20}{20} \text{ and with } + 1 D = J. 1.$$

The ophthalmoscope showed the discs to be pale and the central vessels a little reduced in calibre.

At the present time he smokes a pipe of bird's eye tobacco daily, and a cigar occasionally.

XII. S.W. Age 43. Complained of being unable to read a sign board on the opposite side of the street. His eyes ached after reading, and the letters seemed to be covered with a mist like tobacco-smoke. Smokes half an ounce of Shag tobacco and drinks about three glasses of beer daily

$$V. R. = \frac{20}{200}, \text{ and } J. 16$$

$$L. = \frac{20}{200}, \text{ and } J. 16$$

Central scotoma for red and green.

The ophthalmoscope showed pallor of the outer halves

of both discs.

To have tincture of nux vomica in mixture.

In two months V. was equal  $\frac{20}{50}$ . Two months later V. was  
 $= \frac{20}{30}$

Green and red were now recognised at the fixation point, but, they had a brighter colour in the periphery of the field.

XIII. F.M. Age 45. Sight failing for a year. Lately unable to read. Has an idea that family troubles had caused his sight to fail. His general health has not been good for some time. Has smoked for 25 years. At present time he smokes half an ounce of tobacco and drinks three or four pints of beer daily.

$$V. = \frac{20}{200}$$

Central scotoma for green and red.

The ophthalmoscope showed pallor of the outer halves of both discs. To take a mixture of quinine and nux vomica, and to have the constant current once a week. Two months later his V. had not improved, but, he had not given up the use of tobacco and alcohol. This patient did not return.

XIV. W<sup>m</sup>. F. Age 22. Complained of his sight failing for some months. He compares the defect to being in a mist. General health good. Smokes half an ounce of Shag tobacco, and drinks four pints of beer daily.

$$V. = \frac{20}{200}$$

Central scotoma for green and red.

The ophthalmoscope shows the discs to be normal.

To take mixture of iron and strychnia.

In three months the V. was =  $\frac{20}{40}$ . One month later the V. was =  $\frac{20}{30}$  in both eyes.

Green and red are now recognised at the fixation point.

- XV. Geo. W. Age 50. Complained of a mist before his eyes. Both distant and near objects are indistinct. Smokes half an ounce of tobacco and drinks five or six glasses of beer daily.

$$V. = \frac{20}{200} \text{ and J. } 16.$$

Central scotoma for green and red.

Ophthalmoscope showed slight pallor of the outer halves of both discs.

Treatment.

No tobacco and no alcohol. To take quinine mixture.

In three months he could see much better. V. =  $\frac{20}{50}$

He recognised the green and the red when placed at the fixation point. The discs now appear normal.

- XVI. B. M<sup>c</sup>Q. Age 43. Sight failing for six months. Everything looked misty. Smokes half an ounce of twist tobacco daily and drinks immoderately.

$$V. R. = \frac{20}{70}$$

$$L. = \frac{20}{50}$$

Central scotoma for green and red. The discs looked normal. To take mixture of acid nitro-muriatic dil. with infusion of quassia.

In five weeks V. was =  $\frac{20}{50}$

He now recognised the green and the red at the fixation point. One month later V. =  $\frac{20}{30}$  and steadily improving.

XVII. J.S. Age 60. Complained of failing sight. The left eye was the first to fail. Remarked that his sight was worst in the early part of the day, and when out of doors. Smokes half an ounce of shag tobacco and drinks one pint of porter daily.

V. R. =  $\frac{20}{70}$

L. =  $\frac{20}{200}$

Central scotoma for green and red.

The ophthalmoscope showed slight pallor of both discs on the temporal side.

To take mixture of nux vomica. In three months his V. had improved to R. =  $\frac{20}{30}$  and L. =  $\frac{20}{40}$

~~in~~ One month later V. was =  $\frac{20}{30}$  in both eyes.

XVIII. J.M.H. Age 50. Complained of his sight failing for three months. Smokes half an ounce of Shag tobacco and drinks immoderately. Patient thinks tobacco did not agree with him

V. =  $\frac{20}{70}$  and J. 16

Central scotoma for red and green. The discs were normal. Take mixture of quinine and strychnia.

In four months his V. was =  $\frac{20}{30}$  and J. 2.

XIX. G.T. Age 46. Nervous man. Complained of his sight failing for six months. Remarked that smoking made him worse. Abstainer.

V. =  $\frac{20}{100}$  and J. 14.

Central scotoma for red and green.

The ophthalmoscope showed slight haze on both discs.

Treatment.

No tobacco.

In five months V. was =  $\frac{20}{40}$  and J. 4.

XX. A.L. Age 45. Foreigner. Complained of failing sight of three weeks duration, accompanied by photophobia and aching of the eyes. Heavy smoker and drinker.

V. =  $\frac{20}{50}$  and J. 1 badly.

Relative central scotoma for green and red.

The ophthalmoscope showed the discs to be normal.

Treatment.

No tobacco. Allowed one pint of beer daily.

To take mixture of quinine.

In 14 days V. was =  $\frac{20}{30}$  and J. 2.

Two months later V. =  $\frac{20}{20}$  and J. 1.

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