A RECORD AND ANALYSIS, WITH CONCLUSIONS UPON THE EXAMINATION OF 1041 SCHOOL CHILDREN ATTENDING THE BRADFORD EYE AND EAR HOSPITAL FROM APRIL 1902 TO NOVEMBER 1905.

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The following books have been consulted in the compiling of my Thesis.

1. Hygiene of the Eye. Cohn. English Translation.

2. Syatem of Diseases of the Eye. Norris and Oliver. Edition 1897.

3. Diseases of the Eye. Berry.

4. Diseases of the Eye. Nettleship.

5. School Hygiene, in its Mental, Moral, and Physical Aspects. Journal of Royal Statistical Society, Sept. 1897. Kerr.

6. The Medical Inspection of School Children. W. Leslie Mackenzie & Edward Matthews. Edition 1904.

7. School Hygiene. Arthur Newsholme. Edition 1905.

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S E C T I O N 1.

INTRODUCTION, WITH A BRIEF DIGEST OF WORK DONE BY VARIOUS AUTHORITIES.

PAGES 1 to 19.

One of the most important factors which we have to deal with in connection with the training of our School Children is the change which takes place in the refractive media and mechanism of the eye from birth up to the age of about 11 years.

For some years this important subject has been much discussed and very valuable results have been obtained by the work of many eminent Ophthalmologists.

In the first place, unless we can have practically all the school children in a community under the influence of some mydriatic, such as Atropine or Homatropine, for the purpose of examining their eyes and watch their progress, and once a year have them re-examined with the ophthalmoscope, their refraction tested by means of retinoscopy, and so note any change in refraction or any change in the condition of the retina, our efforts at arriving at any exact result will be disappointing.

It would also be necessary to have a thorough knowledge of any defect in the refraction of both parents, so that the question of the influence of heredity might be gone into, and also the full clinical history of each child, so that it could be decided if any former illnesses had any bearing upon

the defect in the refractive media.

Berry[1] says that "the eyes of new born infants are almost invariably hypermetropic, and that in the higher degrees of Hypermetropia there appears to be a kind of arrest of development." Whilst many observers point out the fact that there seems to be sufficient proof that a change does take place in the development of the eyeball from birth until the age is 8. Other points more or less important are:- the question of lighting of schools, position of desk to the windows, the distance of the form from the desk, the difference between the front edge of the seat and the lower side of the inclined desk, the proper position of the book or paper to the child, the position of the child whilst sitting at the desk, the paper which is used, the type in the different books etc, - upon which I intend giving a brief digest of the results obtained from various observations from authorities in America, the Continent, and the British Isles.

During the time I was engaged in investigating the records and results obtained by the different authorities upon the question of School Hygiene in relationship to the eyesight of the community, I was much struck with the fact that in the majority of instances the only means employed in arriving at any conclusion was by taking the visual acuity by the test types (Snellens) and this when both eyes were uncovered.

(1) Diseases of the Eye. Edition 2, page 533.

The child was considered to have normal vision for practical purposes if he was able to read $\frac{6}{6}$ when he had the combined use of both eyes. To decide whether he was Hypermetropic or Myopic, convex glasses were placed in front of his eyes, and if any improvement in vision, he was considered to be Hypermetropic, whilst if concave glasses improved the vision, he was considered to be Myopic. It has been pointed out that in slight cases judgement is guess-work. Certainly during the last few years more care has been exercised, and in one or two instances school children have been examined by means of a retinoscopy mirror,[1] as well as with the ophthalmoscope both by the direct and indirect method, after having taken the visual acuity. One authority[2] states that " an estimate of the acuity of vision under ordinary circumstances is wanted. It merely complicates matters if each eye is measured separately" yet anyone who has been in an out-patient department of a Hospital must be aware of the fact that it is of the utmost importance to see that the vision of both eyes is absolutely normal, or before the child has advanced much in years one finds that he is handicapped in his class-work.

1. Medical inspection of school children. Mackenzie 1904.

2. Kerr. "Howard prize essay" Page 31.

I think that Professor Risley is taking a very wise stand when he advises his readers that the first question which every child should be asked when entering a school is:- "Have your eyes been tested?" "Illiterate" card of Snellens could be employed or the examination could be deferred until the child knows his letters. The conclusion which he comes to is,[1] "that if these congenital anomalies of refraction could be carefully corrected by suitable glasses at the very beginning, we should hear much less complaint of the harmful influence of the schools upon the eyesight of our children." It certainly seems to me equally important that the child should be able to have full vision in both eyes, for one is aware of the fact that should there be unequal action of the muscles of the eyes, it gives rise to an enormous amount of trouble, headache, sickness etc. In very many of these cases the vision, if taken by the ordinary test types appears to be quite normal, yet if each eye is examined separately for visual acuity, very often some defect is found and gives us a good clue as to the true state of affairs.

Dr Kerr[2] very forcibly points out this very fact in "School Hygiene" by A. Newsome. "The continued over-use of one of these muscles (Recti) or of one set of muscles, is a most frequent cause of headaches, pain, and general nervous disturbances.

1. Diseases of the Eye. Norris & Oliver. Vol: 2 Page 373.

2. School Hygiene. Edit: 2. 1905. Page 87.

Apart from cases where a slight weakness of one muscle causes over-action and pain, or neuralgia as in cases where a tendancy to squint is habitually corrected,(latent squint)".

Another factor in the investigation of the eyesight of school children appears to be absolutely lost sight of, yet it is the most important point affecting the development of the eyeball. I refer to the question of "functional paralysis" or habit spasm, which is due to the fine muscles in the eye being habitually taxed and so one gets a condition of nervous irritability and want of control in the nerve centres. It is a mixture of spasmodic action combined with almost paralytic weakness in these muscles, with the result that the child's eyes become congested and irritable, and distant vision becomes bad.

That school children should have their eyes systematically examined I think everyone is agreed; but that this examination should be more than a cursory examination there seems to be some doubt in the minds of many. If you take the result of a cursory examination of 18058 children by Dr Kerr,[1] you will find that a large proportion of those who appear to be mentally deficient and backward, have some trouble or defect in their eyes.

1. Dr Kerr's report. London School Board. March 25th 1905.

	Ages:-	8	9	10	11	12
14079 Boys	Precocious 8196	29.8	25.5	19.9	20.5	18.7
	Retarded 5883	47.2	40.0	29.3	27.5	29.6
13979 Girls	Precocious 8090	33.2	40.0	29.3	27.5	29.6
	Retarded 5888	57.1	47.0	40.5	35.9	32.4

From this table it is quite evident that a large number of both girls and boys who do not progress well with their school work have trouble with their eye-sight, and this fact is more noticeable in the case of girls. If then, there is this number of children suffering from defective eyesight, and who are known to be backward in their work, how many children are there who pass the test of normal visual acuity yet may have some eye trouble which has escaped observation and which will be a serious drawback to the child concerned? It is admitted by many, that the eye is in every respect the leading sense, in fact its importance in the acquisition of knowledge can scarcely be over rated. On it depends in a more intimate way than on any other sense success in the struggle for life. Again,"some authorities maintain,[1] that of childrens eyes probably not more than 10% to 12% are normal, and in many of those affected the deviation from the normal is so slight that clear vision is possible without artificial aid.

1. Medical inspection of school children. W. Leslie Mackenzie. 1904. Page 288.

In the majority however, the de-viation is so great that normal vision is impossible without artificial correction." It has been pointed out that,- "acuteness[1] of vision is variable from day to day and from hour to hour in the same child" therefore, any test depending upon this examination alone is obviously faulty.

In giving a brief digest of the work which has been done by different observers it will be quite impossible to quote every figure; but I think by summarising one can see fairly clearly the different steps which have been taken in arriving at the conclusions held today in regard to the eyesight of children.

Beer in 1880 (in treatment of healthy and weak eyes. Vienna) was the first to draw the attention of teachers as to how school children should be treated to preserve their eyesight; but it was left to James Wear in 1812 to make a systematic examination of such vision.

Shurmayer from the year 1839 to 1850 from 15 schools examined 2172 children and found $\frac{1}{5}$ short-sighted, whilst in the Higher Municipal Schools, 46 scholars out of 930 were Myopic .

Szokalsky in 1848 found that at the College Charlemagne at Paris 1 scholar in 9 was Myopic, and at the College Louis le Grand 1 in 7 was Myopic.

1. Kerr. Howard prize essay.

E.Von Jager in 1861 was the first to examine children with the ophthalmoscope, with the result that in children from 7 to 14 years, in an Orphanage:-

33% were Normal sight,
55% Myopic,
12% Hypermetropic.

In 1865 Professor Rute examined 213 children, sent by teachers of two national schools in Leipzig, as suffering in the eye. These 213 were taken from 2514 school children. The following is the result:-

107 Inflammation of the eyelids. Conjunctiva, and Cornea.

48 Myopia,

55 Hypermetropia.

Cohn("Hygiene of the Eye". Engl: translation. Page 56.) between 1865 and 1868 examined 10060 children. The preliminary test was with test types, and those who could not read at normal distance with the test types were examined with the ophthalmoscope with the result that :-

5.2% of the village school children had defective sight

19.2% of town children had defective sight.

Altogether 17.1% were ametropic, that is:-

83% were Emmetropic,
13% Defective Refraction (10% Myopia),
4% Various diseases of the eye.

He (Cohn) points out that he excludes all cases of Myopia below 1 Diope, thinking them of little account. On the importance of the relationship of Myopia to school children attending different kinds of schools he gives the following table:-

Frequency of Myopia.

5	Village schools	1.4%	Myopia
20	Elementary schools	6.7%	"
2	Higher schools for girls	7.7%	"
2	Middle schools	10.3%	"
2	Real schools	19.7%	"
2	Gymnasia	26.2%	"

From this he deducted that in village schools the percentage of short sight is very low, while in the town schools the number of short sighted scholars constantly increases with the grade of the school from the lowest grade to the highest. In village and elementary schools there is no essential difference between the sexes, but in Gymnasia and Real schools twice as many boys as girls are Myopic. The degree of Myopia increases from class to class in all schools.

Staphyloma Posticum.

Village schools	0.2%
Elementary schools	0.5%
Higher Girls schools	0.3%

The higher the degree of Myopia the more frequently it was accompanied by staphyloma posticum.

Hypermetropia was found in 239 children or 2% to 3%, as much in girls as boys. The proportion of Hypermetropia to Myopia was 1 to 4. There was no increase or decrease from school year to school year, or from school to school.

Strabismus Convergens, - 66% were Hypermetropic which is 1.5% of the total number examined.

Right eye	104 cases
Left eye	30 "
Both eyes	23 "
Periodic	44 "
Continual	114 "

Astigmatism,- only 23 cases, 1 wore cylinders.

In 1871 Erismann at St Petersburg tested with Snellens types 4368 scholars at 20 feet distance and found:-

30.2% Myopic
26% Emmetropic
43.3% Hypermetropic
5% Amblyopic or weak sighted.
Also cases of Facultative Manifest Hypermetropia.

He conjectured that Hypermetropia is the normal condition of the eye in youth and that only the minority of cases remain Hypermetropic in after life, the majority becoming short sighted after passing through Emmetropia or normal sight.

In 1877 Cohn atropinised a whole school and found:-

(1) 80% Emmetropic.
(2) Anisometropic very rare.
(3) Ametropia occurs twice as often among boys as girls.
(4) 1% Myopia.
(5) Facultative Manifest Hypermetropia. 77% right & 64% left.
(6) Hm more frequent amongst girls than boys.
(7) Number of cases of Hm does not decrease from the 6th to 13th year, (contradicts Erismann in his examination of town schools).
(8) Every apparently Emmetropic eye became Hypermetropic after the dropping in of Atropine.

He also came to the conclusion that Hypermetropia is the normal condition of the eye in youth confirming Erismanns supposition. He examined the pupils of the Friedrich Gymnasium in Breslau in May 1870, and again in November 1871 with the following results:-

1st Examination	2nd Examination
174 children out of 361 abnormal.	103 Emmetropes & 71 Myopes had left. Only 84 of the former Emmetropes could be re-examined and 54 of the Myopes.

(1st Examination cont:)	(2nd Examination cont:)
Myopia 7%	7 0% of Emmetropes remained Emmetropic.
Hypermetropia 6% with eye disease.	14% or 16% had become Myopic.
	Of the 54 Myopes, 28 became higher.

In 1875 & 1876 Reuss confirmed Cohn's results.

Conrad examined 3036 children and found:-

11%	Hypermetropic	Reading test.
55%	Emmetropic	
32%	Myopic.	
47%	Hypermetropic.	With Ophthalmoscope.
29%	Emmetropic	
22%	Myopic.	

He agreed with Erismann that Hypermetropia slowly passes through Emmetropia into Myopia.

He also found with the ophthalmoscope :-

70%	Hypermetropia	in lowest class.
22%	"	in highest class.
25%	Emmetropia	in lowest class.
24%	"	in highest class.

With the ophthalmoscope Myopia increased from 4% to 51%, and according to the reading test from 11% to 62%, so that 10% were cases of accommodation spasm.

In 1876 Erismann as the result of the examination of 350 eyes examined by himself in 1870 came to the conclusion that change takes place in the eye during school life, and in the majority this change is progressive, that is,- the axis of the eye becomes longer.

In 1880 Priestley Smith examined the school children in Birmingham and found that in 1660 examined 5% were Myopic. Of the teachers at the training college 20% were Myopic.

In 1884 Dr Crichton Brown published an estimate of English children's vision, but his method of examination was faulty, therefore his figures (which agree with most of the German workers) were faulty; but in his report he points out that "shortsightedness [1] is developed almost exclusively during school life. This has been proved to arise from the use of the eyes under unfavourable optical conditions."

Dr Brown's tables:-

Standard	Total number	Short sight.	% of short sight	% girls	% boys.
(1)	760	16	2.1	3.1	2.5
(2)	854	30	3.5	3.6	3.6
(3)	707	38	5.4	6.4	5.8
(4)	607	40	6.6	10.7	8.5
(5)	383	40	10.4	6.5	8.4
(6)	191	15	7.9	10.7	9.2
Total	3502	179	5.1	6.1	5.6

Wallace of Philadelphia after examining 2582 eyes under atropine found 11% were Myopic, the rest were Hypermetropic. These cases were not taken from the general population but seen at the Hospital.

Ferdinands (see B.M.J. September 12th 1891) examined 3002 cases and found :-

No: examined.		Myopia	Per cent.	Hyper:	Per cent.
Males	1767	246	13.9	271	15.3
Females	1235	158	12.7	227	18.3
Total	3002	404	13.4	498	16.3

This was the result of examining 14 schools in Aberdeen.

(1) Report to Education Depart: Nov: 29/1884.

Conclusions.

Hypermetropia -

(1) A large percentage (16.5) of Hypermetropia was discovered especially among children below 12 years of age.

(2) That Hypermetropia was most prevalent amongst the children of the poorer classes.

(3) That the degree of Hypermetropia decreases with age. (Cohn denies this. See page 75.Cohn "Diseases of the Eye").

(4) That Hypermetropia is on the increase.

Myopia.

(1) A large percentage of Myopia was discovered especially where education was pushed, whilst in country schools, the percentage of Myopia was small.

(2) The percentage and degree of Myopia increased with the ages of the children.

Other affections.

(1) Disease of Eyelids, 117 Blepharitis, a few associated with Hypermetropia, the greater number due to infection.

(2) Disease of Cornea, 29 Nebulae and Leucoma.

(3) Disease of Iris, 5 not of any interest.

(4) Disease of Lens, 2 cases of Zonular Cataract.

(5) Disease of Fundus, 3 cases in which the Choroid was affected, and 1 case detachment of Retina.

(6) Strabismus, 49 cases:-

44 Convergent (40 Hypermetropia and 4 Myopia)
5 Divergent,- all Myopic.

(7) Remaining Affections.

In 3 cases the eye was shrunken (Ophth: neonat:), 2 cases were Albinos, and 1 abscess of lid.

Conclusions.

(1) A large percentage of Myopia amongst children examined.

(2) A large proportion of Hypermetropia.

(3) Other diseases in varying proportion.

(4) Prophylactic measures adopted in the schools where inadequate for example:-

a. No special attention is given to the selection of desks and seats.

b. Total absence of the use of proper glasses.

c. Light badly arranged.

In 1897 Kerr in his "Howard medal Prize Essay" on School Hygiene in its Mental, Moral, and Physical aspects, points out the fact that,- "It therefore seems probable that school work is an important factor in the development of Myopia; but it must also be remembered that age increases as we ascend from class to class in a school; and what really happens appears to be that children are born hypermetropic, and with retina with but little function; this last developes rapidly, attaining its maximum about the middle of school life. By 10 or 12 years of age most children have normal vision; there are however a considerable number astigmatic, or slightly myopic, and from these abnormal classes the myopic class is chiefly recruited. This last change seems to be more influenced by town or country life than by school buildings." He also points out that colour vision is abnormal in a minute proportion of children. Normal vision is defined as such that the form of an object should be distinguished clearly when it subtends an angle of 5′ (5 minutes), and in accordance with this idea children have been examined in London, Liverpool, and Bradford.

In London several thousands of children were examined with the following results:-

Boys 43% were defective in one or both eyes.
Girls 35% " " " " " " "

In Liverpool 1750 children were examined by Dr R.J. Hamilton with the following results:-

Boys 34% were defective.
Girls 44% " "

He reports to the School Board :- "The School Board authorities are not to blame for the initial mischief, which is an ill development of the eye itself, and the causes are the conditions under which our city children are brought up, viz:- the narrow streets, small overcrowded rooms, the want of fresh air, the wretched and inefficient food, but they will be to blame if they do not take steps to detect these defective ones in the earliest stages possible."

In Bradford 39118 Board School children were examined. From September 1894 to September 1896.

Standards.	1	2	3	4	5	6	7	Ex 7.
% Defective.	43%	31%	25%	22%	19%	16%	14%	12%

Dr Kerr says,- "The percentage with defective vision cannot be stated correctly as a percentage of a number of school children, as it diminishes from year to year with age, and from class to class as we ascend in the school, and will depend chiefly on the age and sex distribution in any school. Yet if one standard be taken, it is found that the percentage of defect tends to increase from year to year with age in the standard. He also goes on to say that he does not agree with those who think that much serious

mischief is done by elementary schools, believing that home neglect sauses very much more than education can, yet attention must be called to the troubles from which at least 10% of the school population at its very best suffer, and of which the prevention would greatly add to the efficiency of schooling."

In 1897 Professor D. Risley gives a full account of the work done by American observers in regard to the influence of school life upon the eyesight of the community.[1] He points out the fact that:-"The same problem confronts us in the United States as was presented for solution to European observers" viz:- that Myopia increases in the higher classes etc; and that "It is reasonable to expect that some degree of physical deterioration will result from depriving young children of the freedom of the nursery and playground."

Horner noted that of 1878 Myopes, -

34% developed dangerous complications,
9% disease of the vitreous,
11% inflammation of the Choroid,
4% detachment of Retina,
23% Cataract.

Professor Risley in the schools of Philadelphia noted that 60% with Myopic Astigmatism had also Choroidal Atrophies or inflammation; 87% had varying forms of Choroidal disease, and 70% were Asthenopic.

In regard to the question of hereditory predisposition etc, he believes that "short sight itself

1. Norris & Oliver. Vol: 2.
System of Diseases of the Eye.

cannot be looked upon as hereditory, but only the tendency." He also considers that more frequently the children of Myopic parents are sufferers from Hypermetropic Astigmatism.

Dr W.F Norris has published 11 cases which he watched carefully under Mydriatics and noticed the advancing refraction. Astigmatism was present in all; and in each case there was demonstrable Choroidal changes. Professor Risley who also examined 17 cases, says, "My own cases without exception passed from the Hypermetropic ball over into near sight through the turnstile of Astigmatism." In no instance did these eyes in passing from Hypermetropia into Myopia become Emmetropic at any stage of their progress.

Professor Risley collected from his case books 2628 cases which had been examined under Mydriatics with the following results:- (showing the large percentage of Astigmatism etc)

Hypermetropia	9.7%	(
Hypermetropic Astigmatism	90.30%	(Percentage is practically identical.
Myopia	9.67%	(
Myopic Astigmatism	90.33%	(

He also points out that (1st) Emmetropes, (2nd) Hypermetropes, and (3rd) Myopes, are freest from pain and disease in the order named.

Randall, in 1885 collected and published records of 146522 cases with the result :- "Stated in general terms it was shown that the eyes with Hypermetropic refraction greatly out-numbered the Emmetropic and Myopic eyes, particularly during early childhood;

that the Emmetropic eye was comparatively rare, but that the state of refraction most nearly approaching this ideal condition retained an almost uniform percentage throughout school life; that Myopia, extremely rare or entirely absent before the beginning of the educational process, was found to advance steadily in percentage with the progress of the pupils in the schools, while the percentage of Hypermetropia diminished in approximately the same degree.

Extract from "Medical Inspection of School Children" 1904, by W. Leslie Mackenzie M.D. and Edwin Matthew M.B.

Edinburgh report:- There were 600 children examined. Estimated on the basis of defects of refraction, the following had optical defects:-

Ages	6 to 9	-	Males	58%	Females	55.54%
"	9 " 12		"	55.44%	"	55%
"	12 " 15		"	51%	"	54%
	Total		"	54.81%	"	54.51%

Average for both, 54.66%.

Estimated on the basis of the reading test, patients requiring correction for both sexes was 31% (a little less than $\frac{1}{3}$ of the whole.)

Estimated on the basis of refraction, the percentage was 54% (a little over $\frac{1}{2}$ of the whole.) This means that 23%, although their eyes were optically defective, could yet use them to obtain normal vision.

It ought never to be necessary so to use, or rather abuse the eyes.

Astigmatism. 12% Hypermetropic Astigmatism,
5% Myopic Astigmatism.
There were a few mixed cases.

Other defects. One case of conical cornea. Squints 26 (20 boys & 6 girls) mostly due to Hypermetropia.

Blepharitis 30 cases. Conjunctavitis 1 case.

Acuteness of Vision.

Comparison of 600 school children from Edinburgh, and 600 from Aberdeen, with the percentage of normal and defective vision.

NORMAL VISION.

Age:-	6 to 9.		9 to 12.		12 to 15.		
	Males	Females.	Males.	Females.	M.	F.	Average
Edinburgh	65	60	70	70	73	72	68.3
Aberdeen.	84	66	84	84	88	83	81.5

These figures are not entirely confirmed by the result of retinoscopy.

DEFECTIVE VISION.

Age:-	6 to 9.		9 to 12.		12 to 15.		
	Males.	Females.	Males.	Females.	M.	F.	Average.
Edinburgh	35	40	30	30	27	28	31.7
Aberdeen.	16	34	16	16	12	17	18.5

ERRORS OF REFRACTION.

	Edinburgh.	Aberdeen.
Normal	45.33	43.8
Hypermetropia	28.0	36.5
Myopia	6.5	2.7
Astigmatism.		
Hypermetropic	12.67	13.7
Mixed	2.0	3.0
Myopic	5.5	0.3

S E C T I O N 2.

OUTLINE OF THE VARIOUS FACTORS WHICH HAVE A BEARING UPON THE HEALTH AND EYESIGHT OF SCHOOL CHILDREN.

PAGES 20 to 26.

A brief outline of the various factors which have a bearing upon the health and eyesight of our School Children, viz:- the locality of schools, their lighting, furnishing, drainage etc.

In the first instance it is of great importance that judgment should be exercised with regard to :-

LOCATION.

In the towns, Schools should not be in narrow streets, nor near to large buildings which would shut out the light; whilst in the country the choice of the subsoil should be gone into, and it is advisable that a clay subsoil should not be chosen.

Of course attention should be given to the proper drainage etc.

LIGHTING OF SCHOOL ROOMS.

This is of the utmost importance with regard to the preservation of the eyesight of children. The light should be:-

(1st) of sufficient quantity, and to obtain this the distance of the surrounding structures from the school should be equal to twice their own height. To ascertain when the proper amount of light is obtained - Risley ("Diseases of the Eye" Norris &

Oliver. Vol. 2, page 385.) considers a "sufficient test for this is the ability of a normal or optically corrected eye to read D = .50 or diamond type at one third of a metre (12 inches) readily".

Cohn in 1865 found more Myopes among the Elementary schools where the light was shut out by surrounding buildings, and especially in those classes which were located on the ground floor, for here the light was still more deficient than in the higher rooms.

(2nd) Direction from which the light is obtained. This should be from the left, and on no account sh should the child face the window. If sufficient light is not obtained from the window on the left, due to buildings, trees etc. obstructing, light may then be obtained from the right side, but in this case the windows must be high up, the bottom of them should not be less than 3 metres from the floor. Under all circumstances care should be exercised in not having light from two opposite sides, since it occasions crosslights and perverse shadows.

SCHOOL FURNITURE.

The Desk. The main points with regard to school desks are as follows:-

(a) The Difference.
(b) The Distance.
(c) The Form Height.
(d) The Desk Slope.

(a) The Difference is the vertical distance between desk and form. The distance of paper or book from the child's eyes should be from 14

to 16 inches,- this is about the distance of a child's eye from the elbow, when the arm is hanging straight down. The text of school books should be easily legible at that distance.

(b) The Distance. For the upright position of the head the distance must be nil, or better still, negative; or in other words, the front edge of the seat should come in front of a vertical line dropped from the lower edge of the desk (minus distance).

(c) Height of Form. The height of the form must be equal to the length from knee to sole of foot of the child, so that the knee will be at right angles when sitting down.

The seat should be level, and as wide as the thigh is long.

(d) Slope of Desk. Cohn says that the desk should not be flat; but the best slope for this is 1 in 6. Priestley Smith has suggested that four different sizes of desks are quite sufficient for children of all ages.

Fahrner in 1879 points out, "It should be borne in mind that upright sitting is dependent upon the proper relation between the desk and chair rather than upon the nature of the required work, and that:-

(1) The upright position is absolutely essential.

(2) Both eyes should be of equal distance from the paper.

These points are absolutely necessary for the preservation of the eyesight.

The Colour. For school walls the colour should be neither dazzling nor dark,- light grey being recommended as the least trying.

Blackboards, Maps, Books etc.

The strain upon the eyes is much greater at the near point, as in reading and writing, than when looking across the room at distant objects, such as a blackboard etc. Blackboards have been condemned on account of the grey surface, but black crayon upon white paper, or large slates have been substituted. The advantage of white letters upon a black surface, or black letters upon a white surface cannot be denied.

Professor Horner (Norris & Oliver, page 406) found that " an eye that can read ink made letters of a given size at 12 inches would be compelled to bring them to 9 inches in order to see them if made on grey-black slate with a slate pencil, thus causing greatly increased strain upon accommodation and convergence."

Professor Risley condemns the use of work done with pencil and paper, but advises pen and paper.

Wall Maps, etc. Geography is most trying to children on account of the hunting for names of places,- therefore on the Maps which are used the printing should be clear and distinct so that the names of places can easily be found.

Text Books. The paper used in the making of the books should be opaque and of such a kind as not to absorb the ink, otherwise the printing will be visible on the other side, a condition which on no account should be allowed.

Bluish-white or grey paper should be avoided, and glazed paper reflects the light injuriously. An opaque, with a white or cream surface is the best.

Type. "In order to distinguish letters they must subtend an angle of at least 5 minutes, and the lines of which they are composed an angle of 1 minute". This is the limit of normal acuity of vision but it certainly is not advisable for the eye to be required to work at its utmost capacity for any lengthy period.

The important points in regard to type are the following:-

(1) Size or Height, breadth of the letters, and thickness of the strokes.

(2) Arrangement. (a) Distance between the letters and words, - Spacing.

(b) Distance between the lines,- Leading.

(c) Length of the lines.

The points mentioned above are extremely important, and if adhered to will greatly relieve the strain upon the child's eyesight.

A good deal of discussion has taken place upon the character of writing, some authorities favouring vertical script, others slanting; but if the teacher realizes the importance of the child keeping in the upright position, and that both eyes be an equal distance from the paper, then it will not matter which kind is used.

Professor Risley says, "My own judgment is to favour slanting letters if choice is to be made"; not

because it is more favourable to upright sitting but being unable to see any reason for changing to the less graceful vertical writing.

Work of the School.

It is absolutely necessary that the work should be frequently changed so that a lesson which requires close application in reading or writing should only be of short duration; this could be varied by a lesson on the blackboard, map, or by oral instruction.

One authority favours the idea of, after every lesson of half an hour's duration, marching the class into the passages, etc., before having another lesson, so as to take the attention away from the work that has preceded.

In the case of children who have defective sight, or in those who have feeble health ,it would be far better if the curriculum could be modified even though it might lengthen the school life.

Our children enter upon their educational training at a too tender age. During the first year at school the methods of instruction should be so modified as to avoid as far as possible continuous work at a near point.

Kerr (School Hygiene, page 89. Newsholme) came to the following conclusions in regard to eye work in infant schools:-

(1) Exclude very fine work.

(2) Insist on work only at a minimum distance of 10 inches from the eye.

He came to these conclusions upon the following grounds:-

(1) In a considerable proportion the actual nervous mechanism is not fully matured to give or interpret the full value of the image on the retina.

(2) The accommodative and convergent strain cannot be maintained for long.

(3) There is required an excess of accommodation to compensate for the shorter eyeball.

Devices for care of Weak Eyes.

Kallmann an Optician of Breslau has what he calls a "Face rest",- an instrument which keeps the head erect, and at the proper writing distance, thus preventing the child's face from being too near the paper.

The only question which remains to be dealt with is that of the conditions under which the child prepares its home lessons, or spends its time in "home reading". The importance of looking after the position of the child to the table, the proper amount of light, etc., are points which should certainly be impressed upon the parents, for undoubtedly the eyesight is considerably impaired by the lack of thought and knowledge on the part of the parents.

S E C T I O N 3.

OUTLINE OF WORK DONE, WITH DESCRIPTION OF CASES OF GROUP 1, WHICH CAME FOR SOME DISEASE OR INFLAMMATION OF THE EYE, ETC.

PAGES 27 to 40.

For some little time I have attended the out-patient department of the Bradford Eye and Ear Hospital, and was much struck with the number of children who came with "School Notices".

I collected and carefully recorded in a "Case Book" 1041 of these cases, and considered that here was sufficient material upon which could be based a very interesting and instructive "Thesis" bearing upon the question which is at the present time occupying such a prominent position in the minds of School Medical Inspectors.

These cases (numbering 1041) which I wish to analyse and try to come to some definite conclusion upon with regard to the protection of the eyesight of school children, are practically I consider, one half the number attending the Hospital. They are children between the ages of 5 and 13 years, residents of Bradford, and who have attended the Hospital on Wednesdays and Saturdays (Dr Little's out-patients) from April 1902 until November 1905 (3 years). The remaining half have attended on Tuesdays and Fridays.

For all practical purposes I estimate that these cases which I am investigating, roughly represent one half of the "school notices" which are taken any notice of by the parents. The majority are not in a

position to pay the fees of a consultant, and so come to the Eye and Ear Hospital for treatment.

As the method employed in giving school notices is still the same as when Dr Kerr wrote his "Prize Essay upon School Hygiene" in its Mental, Moral, and Physical Aspects, I cannot do better than quote him word for word. "The most complete examinations are those of the Bradford School Board, where every child in the standards is examined annually; if defective vision calls for treatment, the parents are notified once, twice, or thrice; and this having been done, the function of the board's medical adviser as regards individual children ends."

"The Bradford Board Schools are divided into two sections; in one the school year ends in January, in the other in June. Once every year, in the third month of the school year, April or September, as may be, when the light is fairly constant during the day, the children are tested by copying test letters of a standard type, prepared by Pickard and Curry, of London. The type are block type, each letter is square, with the lines of the letter equal in width to one-fifth the side of the square. They are arranged to be suitable for any distance from ten to twenty feet. Letters made of such sizes subtend at the given distances an angle of 5′. "

The test card is hung in a fair light centrally in front of a class of children, the nearest horizontal distance in feet from the card to each row of desks is measured by the teachers; it must not be less than 10 nor greater than 20 feet.

Paper sheets are distributed to the children, with spaces at the top for the name in full, age, standard, and school, a square space at the top right hand corner, under which is printed, "space for the number as told by the teacher," is filled in by the child with a number representing the distance in feet of its desk from the test card."

"The children are then told to fill in on the sheet all the letters on the card, and where they cannot distinguish any letter clearly, to make a cross. Children who wear spectacles at the examination write "glasses" after their names. Children who work half-time, write "H.T." after their names.

The papers are then collected, and forwarded to the Medical Superintendent, who thus obtains a record of name, age, sex, standard, school, whether wearing glasses or working half-time, distance from the test card, and smallest type correctly distinguished at that distance. The distance at which the child sat as numerator, and the distance at which the smallest type clearly read should be read by a normal eye as denominator, gives the ratio of acuity of vision to the normal. If this fraction is less than unity, the vision is defective, if greater than unity, it is hyperacute."

I find that out of these 1041 cases, 725 were very carefully examined. The method of examination which was adopted was as follows:- The child was placed 6 metres away from Snellens test type, the left

eye covered by a black disc, the child was then told to read the letters on the card. The visual acuity of the right eye was then recorded. Then + spherical glasses were placed in front of the right eye and any improvement noticed and recorded, or any manifest Hypermetropia. If no improvement, — spherical glasses were placed in the trial frame and any improvement noticed. The right eye was then covered by the black disc and the left eye tested in a similar manner to the right. Any inflammation of the conjunctivae, eyelids, or cornea, was also recorded. Then 2% homeatropine was dropped into both eyes, the patient sent into the dark room, and in the course of an hour, after the pupils were fully dilated, the fundus was carefully examined with the ophthalmoscope first by indirect method, then by the direct method, then Retinoscopy was taken, and any change in the lens or fundus noted and recorded. After that, the child was told to come again the following week, when his visual acuity was again carefully examined and upon the strength of the information obtained by the Retinoscopy, the most suitable glasses, either spheroids or cylinders, or a combination of both, were recommended. Also when wearing this correction, the visual acuity was again recorded. Any medicinal treatment (either in the form of local applications, lotions, ointments or fomentations etc) was recorded, also any surgical interference, and the number of visits paid to the Hospital in each case.

Unfortunately I must confess that the notes of many of these cases are not so complete as I could wish, yet one can readily understand that in a busy out-patient room, should the child whilst having the visual acuity taken be either stupid or nervous, then, as in several instances drops (homeatropine) have been placed in the eyes, the child sent into the dark room, and the retinoscopy etc taken in due course, so that several of my data are somewhat incomplete.

I have also to record 305 cases in which there has been no homeatropine or atropine used, and the retinoscopies have not been taken, although some of them have had their visual acuity taken. These cases came to the Hospital suffering from inflammation of the eyelids, conjunctivae, cornea, or some other diseased condition or injury to the eye, and were treated by either local applications, or local application and medicine, but nothing else noted.

There is one other group which had atropine or homeatropine in their eyes, but which had not any refraction taken, - these numbered 11 and consisted of a few cases of Cataract, Glioma, Choroiditis Pigmentosa etc. (see group

Cases in which no Homeatropine or Atropine was used and no Retinoscopy done, - 305 cases. (see table

This group in the main consists of children who have come to the Hospital suffering from some inflammatory condition of one part or other of the structure of the eyelids or eye, and have been treated

for the most part by giving some local applications such as Boracic Lotion, with Yellow Oxide of Mercury ointment to which has been added in some few cases, Atropine or Cocaine, whilst some of the children have been given the Syrup of the Iodide of Iron.

The diseases consist of Blepharitis, Conjunctivitis, (acute, purulent, and syphilitic) Phlyctenular Keratitis, Marginal Keratitis, Interstitial Keratitis, Maculae and Nebulae, Ulcer of Cornea, and a few cases of Strabismus, in which Liq: Atrop: had been given but they did not return for retinoscopy. Also Congenital dislocation of lens, Transient Paresis of the third nerve, Lacrymal abscesses, Abscess of lid, Cysts, Styes, Eczema of lid, Foreign body in the eye, Haemorrhage into Conjunctiva due to Traumatism, Traumatic Haemorrhage into Anterior Chamber, Enucleation rendered necessary by Traumatism, and one case of Xerosis Conjunctivae. (See appendix 1. for ages etc)

Of this group it is noticed that the Cornea appears to be the most commonly attacked portion of the mechanism of the eye, and in reference to this it is I believe a commonly accepted fact, that Keratitis in all its forms is associated to a great extent with the conditions under which the child is reared, and many of these cases bear out this fact. In very many instances the children have been unkempt, untidy, and dirty, and it has been necessary to take them into the Hospital; and by better surroundings and cleanliness the trouble has very soon cleared away.

On the other hand, at least 4 cases of Keratitis

have been directly traceable to Syphilis.

Phlyctenular Keratitis.

This, Berry includes under the group of primary Keratitis (i.e. deriving their origin from a focus of inflammation which is situated in the Cornea) and is very often associated with Phlyctenular Conjunctavitis. Unfortunately I find in examining these cases that Phlyctenular Conjunctavitis, and Phlyctenular Keratitis have been used almost synonymously, and it appears to be exceedingly common,- there are 57 cases out of the 305. It is more common in girls than boys, 40 of the cases being noticed in girls, and only 17 in boys, whilst it was more common between the age of 5 and 8 years than at any other period. (see table 1. Appendix 1.)

This disease occurs in the form of single or multiple small superficial and at first nonvascularised infiltrations of the Cornea. The infiltrations are rarely more than a pins head, and these break down and form small ulcers, which generally yield to the treatment I mentioned at the commencement of this group. The child suffers usually from intense photophobia and this may become so intense as to produce Blepharospasm. It was noted in this class of disease that the condition was very prone to return, the patients having attended the Hospital for several relapses. In some few cases, there had been Measles, Scarlet Fever, or some other acute illness previously.

Marginal Keratitis.

This consists of an acute inflammation at the margin of the Cornea, the child has Photophobia, Lacrymation, and upon examination of the eye the vessels at the corneo-sclerotic junction are seen to be full of blood. In this group I found 23 cases, and as in Phlyctenular Keratitis the girls appeared to be affected more than the boys(16 girls and 7 boys) and it was the commonest between the age of 5 and 8 years.

Interstitial Keratitis, or Parenchymatous Keratitis.

This is described by Berry under the group of Secondary Keratitis. It never leaves any destruction of Corneal tissue. It generally commences from the periphery, and finally the whole Cornea becomes infiltrated uniformly. The appearance is that of diffuse greyish opacity of the Cornea with a zone of injection of vessels at the corneo-sclerotic junction, photophobia, and lacrymation. This disease is usually of a very prolonged character, although if treatment is persisted in, the child ultimately regains practically good eyesight. Nearly all these cases of Interstitial Keratitis were treated by giving Iodide of Potassium combined with the Liq: Hyd: Perchlor: whilst locally Ung: Flav: $\bar{c}$ Atrop: was used, or where great photophobia some Cocaine was mixed with the ointment. Of the 49 cases of this group, it was noticed that only 4 (2 boys & 2 girls) had special evidence of Syphilis. The remaining 45 cases (20 boys and 25 girls) were, many of them, undoubtedly

Syphilitic in origin. This group or class of cases caused more work to the Hospital staff than any other, very many of the children having to be admitted as in-patients so that they could be under observation.

Ulcer of Cornea.

Although I am fully aware that this is a very wide term, yet I have to accept the diagnosis of the cases, but they will serve the purpose of emphasizing the fact that a great number of children suffer from disease of the Cornea, and also that the dirty conditions under which the poorer ones are reared is an important factor in this disease. Undoubtedly in many cases the Phlyctenules in Phlyctenular Keratitis have broken down leaving an ulcer. Of the 48 cases of "Ulcer of Cornea" 34 were girls and 14 were boys; again showing the fact that girls appear to be the greater sufferers, and it was more common between the ages of 5 and 9 years. The treatment was Boracic Lotion, Ung: Flav:, and Syrup of the Iodide of Iron.

Maculae, Nebulae, and Leucoma.

After the ulceration has subsided and the healing process taken place, it is found that the loss of substance is replaced by an intransparent connective tissue, and so we have left a white opacity, - a Macula or Nebula of the Cornea, due to cicatrisation. A dense scar is called a Leucoma.

Of this group there were 19 cases (8 boys & 11 girls). It was noticed that if the treatment, which

consisted of the Yellow Oxide of Mercury ointment, and Lotio Boracic, was persisted in, even in the cases where there were very large Maculae, the condition gradually improved (although the process was somewhat slow) so that the child got exceedingly good vision.

Conjunctivitis.

An inflammation of the Conjunctiva, either Catarrhal, Purulent, or Membraneus, besides Granular and Phlyctenular Conjunctivitis. Under the heading of Conjunctavitis we find 38 cases of the 305, of which 6 were simply designated Conjunctavitis, whilst 22 (12 boys & 10 girls) were acute Conjunctivitis; 9 (3 boys & 6 girls) being Purulent Conjunctivitis, & 1 case was classified as being of Syphilitic origin associated with Iritis. The treatment in the main consisted of Boracic Lotion 1 grain to the ounce of water, with Ung: Flav:, or, if much photophobia Ung: Flav: $\overline{c}$ Cocaine, and in some few cases, Lotio Formaline $\frac{1}{2000}$ was used. It was noticed in several cases that other members of the family were affected with the same disease, showing the fact that undoubtedly this group is very infective; whilst in one or two cases the disease had followed or was a complication of one of the infective fevers :- Measles, or Scarlet Fever. In one case, where the discharge had been microscopically examined, the pneumococcus baccili had been found. In the Purulent type it was necessary to use rather stronger antisceptic lotions than Boracic, and in some cases Lotio: Hyd: Perchlor: was used with success.

Xerosis Conjunctiva,- 1 case a boy 8 years old.

This is a dry lustreless condition of the Conjunctiva associated in the severer forms with a shrinking of the membrane. The treatment was Lotio Boracic, and Ung: Flav:.

Blepharitis, or Tenia Tarsi.

This is an eczema of the margin of the lid and is exceedingly common amongst the poor and unkempt children. Out of the number that came to the Hospital, there were 36 (15 boys & 21 girls) who were suffering from this disease. It is characterised by hyperaemia and increase of the secretion, and often associated with Catarrhal or Phlyctenular Conjunctivitis. If this condition is not attended to the secretion coagulates and you find crusts or scales at the margin of the lids, and under them a process of ulceration. The treatment consisted in the main by giving Boracic Lotion and Ung: Flav:. When the Conjunctiva was much inflamed, occasionally Ung: Flav: c̄ Cocaine was given.

Other Diseases in this group consisted of :-

Abscess of Lid, - 3 cases, all boys, no history of Traumatism. Treatment,- opened and scraped, Boracic fomentations.

Styes or Hordeolum.

An acute inflammation of the cellular tissue of the lid, leading to suppuration, which points at the margin of the lid:- 1 case.

Cysts , - 2 cases, both girls. Treatment,- opened and scraped, Lotio Boracic given.

Eczema of Lids, - 2 cases, both girls. Treatment- Lotio Boracic and Ung: Flav:

Abscess of Lacrymal Sac,- 2 cases, both boys, 1 case was opened under an anaesthetic, whilst to the other Lotio Boracic and Ung: Flav: were given.

Cases produced by Traumatism.

Haemorrhage under Conjunctiva,- 4 cases, all boys.

This condition was produced by a stone in one case, a top in the next, a fall on the ground in the next, and a piece of glass in the other. The treatment was simply Boracic Lotion used frequently, whilst in the case of the injury produced by the glass, the eye was painted by a weak solution of Liq: Argenti Nit:.

Haemorrhage into Anterior Chamber,- 1 case a girl.

The anterior chamber of the left eye was filled with blood stained serum, reflex was just perceived. This injury was caused by a stone. The treatment consisted of giving Lotio Boracic and Syrup of the Iodide of Iron, and after a month it is recorded that the eyesight was quite normal. In the September the vision being fingers at 1 metre, whilst in the following June she obtained $\frac{6}{6}$.

Enucleation for Traumatism,- 1 case, a boy.

Ten days before his admission he received a blow on his eye which ruptured it. The eye was removed, and Lotio Hyd: Perchlor: used afterwards.

Detached Iris and Opaque Lens, - 1 case, a girl.

This injury was caused by a cracker. The Iris was dislocated, detached backwards and above, lens opaque, conjunctiva injected. Treatment,- Liq: Atrop: and Lotio Boracic.

Foreign body in Eye,- 1 case, a boy.

Abscess of Lid.

Usually this is the result of a blood clot breaking down. There was 1 case, a boy. Treatment,- Incised, and Lotio Boracic given.

Congenital dislocation of both lenses.

There were 2 cases, both boys. In one case it was noticed that both lenses were dislocated upwards and slightly outwards, and there was a coloboma of left lens, also the Iris was tremulous; whilst in the other case the dislocation was outwards, and the Iris tremulous. In neither case had the child suffered from whooping cough,- evidently they belonged to the Idiopathic variety. The treatment consisted simply by giving, in one case Lotio Boracic, in the other Lotio Boracic locally, and Mist Ferri Iodidi internally. They neither of them could see the Board at 6 metres away, and were not improved by convex glasses.

Aphakia, - 1 case, a girl, in which the lenses had been removed for cataract at some other Hospital, but came for glasses. There was no capsule present, she was wearing + 10D.

Transient Paresis of 3rd Nerve,- 1 case, a girl.

The left upper eyelid rises and falls periodically, pupil widely dilated, ophthalmoscopic appearance negative. The treatment adopted was Iodide of Potassium with Liq: Hyd: Perchlor:

Pain in Eyes,- 1 girl. She did not come again.

Pain in Head following Meningitis, 1 boy.

History of the father having died of Phthisis and the boy having had Meningitis.

Strabismus:

In this group the patients have received Liq: Atrop: to put in the eyes, and were to return in one week for Retinoscopy, but did not do so.

Left Internal Strabismus,- 2 boys.

Right Internal Strabismus,- 1 boy and 1 girl.

Convergent Concomitant Strabismus,- 1 boy and 5 girls, making a total of 10.

S E C T I O N 4.

DESCRIPTION OF THE CASES IN WHICH ATROPINE, OR HOMATROPINE WAS USED, AND RETINOSCOPY TAKEN.

PAGES 41 to 72.

CASES IN WHICH EITHER HOMATROPINE OR ATROPINE HAD BEEN USED AND RETINOSCOPY TAKEN.
NUMBER 725.

Of this class the following is an outline of the main groups. (see tables in Appendix 2.)

(1) Hypermetropia	532 cases		(73.378%)
	235 boys		(32.413%)
	297 girls		(40.965%)
(2) Myopia.	93 cases		(12.826%)
	44 boys		(6.068%)
	49 girls		(6.758%)
(3) Mixed Astigmatism	90 cases		(12.413%)
	35 boys		(4.827%)
	55 girls		(7. 586%)
(4) Hypermetropia in one eye & Myopia in the other eye.	5 cases		(0.689%)
	2 boys		(0.275%)
	3 girls		(0.413%)
(5) Emmetropia $\overline{c}$ Asthenopia.	4 cases		(0.551%)
	1 boy		(.137%)
	3 girls		(0.413%)
(6) Emmetropia $\overline{c}$ Conjunctivitis.	1 case		
	1 boy		(.137%)

The above percentages are worked out upon the 725 cases and give a very interesting comparison between the different diseases of the eye in children between the ages of 5 and 13 years.

It is at once seen that Hypermetropia is the condition which predominates in childhood, and of the cases, the proportion of Hypermetropia to Myopia is nearly 6 to 1, whilst even including Mixed Astigmatism with Myopia, (with the rough tests which have been employed formerly, Mixed Astigmatism might have been mistaken for Myopia) we find that Hypermetropia occurs nearly, but not quite, three times as often as these two groups combined. Another point which strikes one is the fact that in all the various groups, the proportion of girls is the greater, especially in the Mixed Astigmatism group,- (4.827% boys & 7.586% girls).

Whilst looking over the various tables which I have compiled to obtain a general view of the subject, I was much impressed with the fact that in all the different groups, the greater majority of the cases were between the ages of 7 or 8 years, to 10 or 11 years. At 5 and 6 years, and 12 and 13 years, the proportion in most instances was considerably smaller.

Ages:-	5	6	7	8	9	10	11	12	13
Hyper: 73.378%	5.517	4.275	7.586	9.379	10.482	12.551	11.310	8.137	4.137
Myopia 12.826%	.137	.551	.689	2.206	1.793	2.620	2.482	1.241	1.103
Mixed Astig: 12.413%		.689	1.241	1.241	2.620	2.482	1.793	1.655	.689
Hyper: c Myopia .689%			.275		.275		.137		
Emmetropia cAsthenopia .551%			.137		.137			.137	.137
Emmetropia c Conjunct: .137%		.137							

It seems to me to be a very striking fact that children at these ages should come for treatment. It evidently points to one of two conditions, either they have defective refraction and by means of the wonderful mechanism they are enabled to overcome this difficulty, and eventually (by gradually increasing the work upon this organ) the different parts of the eye which take part in the process of accommodation get tired, and thus reveal the true state of affairs, or that there is a change in the measurement of the eyeball, - either a progressive elongation or shortening as the case may be, - but upon this I intend making some observations later in my paper.

Hypermetropia is a condition of the eye in which the antero-posterior axis is too short, therefore the principal focus of parallel rays of light lies behind the retina. The eye cannot in a state of rest see clearly at any distance, and even for parallel rays it must use some of its power of accommodation,

consequently it has so much less focussing power left for overcoming the divergence of rays from near objects. In order to correct this condition a convex lens must be used, so as to bring parallel rays to a focus on the retina. Of this group there are practically 5 sub-divisions, but due to some other condition in the eyes, I have divided them into 7 sub-divisions, viz:-

(1) Hypermetropia Simplex.

In this sub-division the refraction was symmetrical round the optic axis.

(2) Hypermetropia in one Eye with an Irregular Cornea in the other eye, rendering the Retinoscopy of that eye impossible.

(3) Hyper: Astigmatism Simplex.

The position of the principal foci of rays refracted through the meridian of greatest and least curvature differs, and should the focus of rays passing through the feeblest refracting meridian be somewhere behind the retina, and that of the most highly refracting meridian on the retina, you get the condition which is known as Hypermetropic Astigmatism Simplex.

(4) Hyper: Astigmatism Compound.

This is where neither of these foci coincide with the retina, and are both behind the retina.

(5) Hypermetropia in one Eye and Emmetropia in the other Eye. Emmetropia is where parallel rays of light come to a focus on the retina without an effort of accommodation.

(6) Hypermetropia in one Eye, and Hyper:Astigmatism Compound in the other Eye.

(7) Simple Hyper: Astigmatism in one eye, and Compound Hyper: Astigmatism in the other eye.

Of the 532 cases comprising this group, the following table gives the percentage and number of cases in each sub-group. (See table 1. Appendix 3.)

(1) Hypermetropia Simplex.	161 cases		(30.263%)
	78 boys		(14.662%)
	83 girls		(15.601%)
(2) Hypermetropia $\bar{c}$ Irregular Cornea.	2 cases		(.375%)
	1 boy		(.187%)
	1 girl		(.187%)
(3) Hypermetropic Astig: Simplex.	18 cases		(3.383%)
	7 boys		(1.315%)
	11 girls		(2.067%)
(4) Hyper: Astig: Compound.	263 cases		(49.436%)
	107 boys		(20.112%)
	156 girls		(29.323%)
(5) Hypermetropia $\bar{c}$ Emmetropia.	1 case		
	1 boy		(.187%)
(6) Hypermetropia $\bar{c}$ Hyper:Astig:Comp:	76 cases		(14.285%)
	37 boys		(6.954%)
	39 girls		(7.330%)
(7) Simple $\bar{c}$ Comp: Hyper: Astig:	11 cases		(2.067%)
	4 boys		(.751%)
	7 girls		(1.315%)

The proportion of Hypermetropia Simplex to all forms of Hypermetropic Astigmatism etc, is therefore:-

Hypermetropia	161 cases	= 30.263%
Hyper: Astig: etc:	371 "	= 69.737%

It will be thus seen that Hypermetropia Simplex forms under $\frac{1}{3}$ of the group of Hypermetropia, whilst in Compound Hypermetropic Astigmatism is seen the largest number of the group.

It is again noticeable that girls are the greater sufferers.

As I have pointed out, after the visual acuity had been taken of the right eye, + spherical lens (convex) were placed in front of the eye, and any improvement noted. This test is spoken of as a Subjective test, and the strongest + lens retaining the full degree of visual acuity measures the manifest Hypermetropia. It is only possible to obtain the full degree of Hypermetropia by paralysing the accommodation by some mydriatic (Homatropine or Atropine) which was done in these cases, and the Retinoscopy taken.

Hypermetropia Simplex.

Of the 161 cases of this group, 153 (72 boys and 81 girls) come under the table attached, whilst 8 cases (5 boys and 3 girls) are irregular, - by that I mean the degree of Hypermetropia is different in each eye.

Degrees	Total of Boys and girls		Total.
Up to + 2D	24 boys.	26 girls.	50
+2D to + 3D	18 boys.	18 girls.	36
+ 3D to + 4D	6 boys.	9 girls.	15
+4D to + 5D	7 boys	10 girls	17
+ 5D to + 6D	5 boys	5 girls	10
+ 6D to + 7D	8 boys	9 girls	17
+ 7D to + 8D	2 boys.	2 girls.	4
+ 8D to + 9D		1 girl.	1
+ 9D to + 10D	2 boys.		2
+ 10D to + 11D		1 girl.	1
		Total	153.

It will easily be seen that the majority of cases (86) are below + 3D. The number of cases between + 3D and + 6D (42) is just about half the number occurring below +3D, whilst the cases occurring above +6D to + 11D (the highest degree recorded in this series of cases) number 25 or just a little over half of those occurring between + 3D and + 6D. The number of cases occurring in each degree of Hypermetropia were, I considered, too small to work out the percentage at each age, but the table in appendix gives the number with age of boys and girls in each degree. (see appendix 4 pages 1+2)

Simple Hyper: Astigmatism, 18 cases, (7 boys and 11 girls) The following table shows the degree of Astigmatism.

Degree	Total of Boys and Girls		Total
+ 1D	3 boys.	2 girls.	5
+ 2D	1 boy.	4 girls	5
+ 3D		4 girls.	4
+ 4D	3 boys.		3
+ 5D		1 girl.	1
		TOTAL	18

(See appendix 4, page 3.)

The number of cases in this group is much too small to come to any definite opinion upon, yet it certainly points to the fact that the degree of Astigmatism is for the most part below + 4D. It will be noticed that there is only one case with + 5D of Astigmatism, - no higher degree than this was recorded.

Hypermetropic Astigmatism Compound. 263 cases.

I must confess it is somewhat difficult to classify the degree of errors of refraction in this group, so I have divided it into 4 sub-groups.

There are 10 cases (3 boys and 7 girls) which do not belong to any of the sub-groups described.

(see appendix 4. Pages 4 & 5.)

Sub-groups.

(1) Small Spherical c̄ Small amount of Astigmatism.

"Small Spherical " is the term I have used to indicate the degree of Hypermetropia of the most highly refracting meridian when it is equivalent to + 3D degrees or under; whilst "Small amount of Astigmatism" is when the feeblest refracting meridian is + 3D degrees or under, added to the degree of the most highly refracting meridian. Some authorities maintain that + 0.5D should not be considered to be an amount of Astigmatism, and so to meet with their wishes, I have placed them in a separate sub-group.

(2) Small Spherical c̄ Large amount of Astig:

The "Small Spherical" as in the former group, is when the most highly refracting meridian is equivalent to + 3D degrees of Hypermetropia, or under; whilst the "Large Astigmatism" is when the feeblest refracting meridian is over + 3D, - that is to say, there is more than + 3D degrees of Astigmatism added to the degree of Hypermetropia of the highest refracting meridian.

(3) Large Spherical $\bar{c}$ Small Astigmatism.

The "Large Spherical" is when the most highly refracting meridian is more than + 3D degrees of Hypermetropia; whilst the "Small Astigmatism" is when the feeblest refracting meridian is equivalent to + 3D degrees of Hypermetropia or under, added to the degree of the other meridian. Here in this group I have separated the cases in which there is only + 0.5D degrees of Astigmatism.

(4) Large Spherical $\bar{c}$ Large Astigmatism.

In this group as in the former, the "Large Spherical" is when the most highly refracting meridian has more than + 3D degrees of Hypermetropia. The "Large Astigmatism" is when the feeblest refracting meridian is more than + 3D degrees, added to the other meridian.

			Total
Small Spherical (+3D & under) $\bar{c}$ Small Astig: (+3D & under)	+ 0.5	Boys 12 Girls 22	34
		Boys 31 Girls 64	95
Small Spherical (+ 3D & under) $\bar{c}$ Large Astig: (over + 3D)		Boys 12 Girls 20	32
Large Spherical (over + 3D) $\bar{c}$ Small Astig: (+ 3D & under)	+ 0.5	Boys 3 Girls 1	4
		Boys 43 Girls 40	83
Large Spherical (over + 3D) $\bar{c}$ Large Astig: (over + 3D)		Boys 3 Girls 2	5

From the above table it is seen that the cases which I have designated Small Sphericals (+3D and under) with Small Astigmatism (+ 3D & under of Astig:) form very much the largest group. The next one being the Large Spherical (over + 3D) with small amount of Astigmatism (+3D & under of Astig:)

whilst the Small Spherical (+ 3D & under) with Large Astigmatism (over + 3D of Astig:) comes third. The Large Spherical (over + 3D) with Large Astig: (over+ 3D of Astig:) has the fewest number of cases.

Hypermetropia c Hyper: Astig: Compound, 76 cases (37 boys and 39 girls.) I have divided this group into two main sub-divisions:-

(1) Those cases in which the right eye was Hypermetropic, whilst the left eye was Compound Hyper: Astig: (see appendix 4. Page 6.)

(2) Those cases in which the left eye was Hypermetropic and the right eye Compound Hyper:Astig: (See appendix 4. Page 7.)

In sub-division (1) I find that in all we have 29 cases (15 boys and 14 girls) out of the 76.

In sub-division(2) we have 47 cases (22 boys and 25 girls.) See following tables for degree.

TABLE SHOWING THE DEGREE OF HYPERMETROPIA IN THE RIGHT EYE WITH THE DEGREE OF HYPER: ASTIG: IN THE LEFT.

Hypermetropia Right Eye. Degree.		Total	Comp: Hyper: Astig: Left Eye. Small Sph: / Small Astig: +0.5 of Astig:	Small Sph: / Small Astig	Large Sph: / Small Astig: +0.5 of Astig:	Large Sph: / Small Astig:	Large Sph: / Large Astig:	Total.
+ 1D	2 boys	2		2				2
+ 2D	4 boys 5 girls.	9	6	1	2			9
+ 3D	1 boy. 2 girls.	3	1	2				3
+ 4D	3 boys	3	1	1			1	3
+ 5D	1 boy. 4 girls.	5	1	1			3	5
+ 6D	2 boys. 1 girl.	3				3		3
+ 7D	1 girl.	1					1	1
+ 9D	2 boys. 1 girl.	3				3		3
Total.		29						29

TABLE SHOWING THE DEGREE OF HYPERMETROPIA IN THE LEFT EYE WITH THE DEGREE OF HYPER: ASTIG: IN THE RIGHT EYE.

Compound Hyper: Astig:Right Eye.

Hypermetropia Left Eye. Degree.		Total.	Small Sph: / Small Astig: +0.5 of Astig:	Small Sph: / Small Astig:	Large Sph: / Small Astig: +0.5 of Astig:	Large Sph: / Small Astig:	Large Sph: / Large Astig:	Total.
+ 1D	2 boys. 3 girls.	5	4	1				5
+ 2D	2 boys. 6 girls	8	8					8
+ 3D	5 boys. 6 girls.	11	4	4		3		11
+ 4D	4 boys. 1 girl.	5	1	3	1			5
+ 5D	2 boys. 3 girls.	5	1	2		2		5
+ 6D	2 girls.	2		1		1		2
+ 7D	2 boys. 2 girls.	4				4		4
+ 8D	1 boy. 1 girl.	2				2		2
+ 9D	1 boy. 1 girl.	2				2		2
+ 10D	1 boy.	1				1		1
+ 11D	1 boy.	1				1		1
+ 13D	1 boy.	1					1	1
TOTAL.		47						47.

From the foregoing tables, it will be at once noticed that there are fewer cases in the group where the Right eye is Hypermetropic pure and simple.

Hypermetropia occurs more in the Left Eye; the Right eye having Compound Hypermetropic Astigmatism. It will also be noticed that there are more cases between + 1D and + 3D than all the other degrees put together.

Myopia.

This is a condition of the eye in which the antero-posterior axis is elongated, therefore the principal focus of parallel rays of light lies in front of the retina. Rays of light emerging from any point of the fundus will pass out convergently and will unite in front of the eye at the conjugate focus of the retina. When uncorrected, the vision for distant objects is indistinct, and more so in the higher degrees of Myopia. This condition is considered by some authorities to be mostly axial, and though not congenital, the tendency to the elongated shape of the eye is undoubtedly inherited.

In several cases it was noticed that either the mother or the father of the Myopic cases also suffered from Myopia. Myopia is sometimes the result of disease, and when this is the case, as a rule, it rapidly assumes a high degree and often eventually leads to blindness. In order to correct this condition a concave lens is necessary.

This group I have divided into 6 sub-divisions, viz:- Myopia pure and simple, Myopic Astig: Simplex, Myopic Astig: Compound, Myopia $\bar{c}$ Myopic Astigmatism, Simple and Compound Myopic Astigmatism, and Myopia $\bar{c}$ Emmetropia.

(1) Myopia Simplex.

(2) Myopic Astigmatism Simplex.

This is where the focus of rays passing through the most highly refracting meridian of the Cornea is situated in front of the retina, whilst that of the rays passing through the meridian at right angles coincides with the retina.

(3) Myopic Astigmatism Compound.

This is where the foci of rays passing through the highest, and that through the lowest refracting meridian, lie in front of the retina.

(4) Myopia $\bar{c}$ Myopic Astigmatism.

One eye was Myopic and the other was Myopic Astig: Compound.

(5) Simple Myopic Astigmatism in one eye. Compound Myopic Astigmatism in the other eye.

(6) Myopia $\bar{c}$ Emmetropia.

One eye was Myopic and the other eye was Emmetropic or Normal vision.

Of these 93 cases I find that the following is the proportion and percentage of the sub-groups:-

(See appendix 3. Page 2.)

(1) Myopia Simplex.	26 cases.		(27.956%)
	13 boys.		(13.978%)
	13 girls.		(13.978%)
(2) Myopic Astig: Simplex.	10 cases.		(10.752%)
	4 boys.		(4. 301%)
	6 girls.		(6. 450%)
(3) Myopic Astig: Compound.	38 cases.		(40.860%)
	16 boys.		(17.204%)
	22 girls.		(23.655%)
(4) Myopia $\overline{c}$ Myopic Astig:	14 cases.		(15.053%)
	8 boys.		(8.279%)
	6 girls.		(6.451%)
(5) Simple $\overline{c}$ Comp: Myopic Astig:	4 cases.		(4.301%)
	3 boys.		(3.225%)
	1 girl.		(1.075%)
(6) Myopia $\overline{c}$ Emmetropia.	1 case.		
	1 girl.		(1.075%)

The proportion of Myopia Simplex to all forms of Myopic Astigmatism etc: is:-

Myopia	27.956%	(26 cases)
Myopic Astig: etc.	72.044%	(67 cases)

It will be noticed by the foregoing table that Compound Myopic Astigmatism is the largest sub-division of this group, and next to this, we find Myopia pure and simple.

In the sub-division "Myopia Simplex" it is at once seen by reference to the table in appendix, that there is no case recorded in children under 8 years old. Out of the 93 cases of the Myopic group, only 10 occurred in children under 8 years, these are in the sub-divisions :-

Myopic Astig: Simplex, 1 case.
Myopic Astig: Compound, 8 cases.
Myopia in one eye and Myopic Astig: Comp in the other eye, 1 case.

As I pointed out before it is a very striking fact, that the great majority of these cases occur between the age of 8 and 11 years.

The degree of errors of Refraction of each sub-division of the group.

This group had their visual acuity taken, and if any improvement was noticed by concave lenses being placed in front of the eye, it was recorded, and then, as was described under Hypermetropia, the "point of reversal" was obtained by means of the shadow test and concave lenses, after Homeatropine had been used. After the "point of reversal" was obtained — 1D was added to the result, this giving the full degree of Myopia present.

Myopia Simplex 26 cases.

Of these 24 (11 boys and 13 girls) come under the group attached; whilst 2 cases (both boys) are "irregular," by that I mean,- the degree of Myopia is different in each eye.

Degrees.		Total.
— 1D to — 2D.	5 boys. 1 girl.	6
— 2D to — 3D	1 boy. 5 girls.	6
— 3D to — 4D	2 boys. 2 girls.	4
— 4D to — 5D	1 boy. 2 girls.	3
— 5D to — 6D	1 boy. 1 girl.	2
— 6D to — 7D	1 boy. 1 girl.	2
— 8D to — 9D	1 girl.	1
	Total.	24.

It is at once apparent that the cases occurring between — 1D and — 3D just equal the number occurring between — 3D and — 9D, the number being 12 in each case. (See appendix 5. Pages 1 & 3.)

Simple Myopic Astigmatism, 10 cases, 9 of which (3 boys and 6 girls) are in the following group.

Degree of Astig:		Total.
— 1D	1 boy. 1 girl.	2
— 2D	1 boy. 1 girl.	2
— 3D	1 boy. 3 girls.	4
— 6D	1 boy.	1
	Total.	9

There is one case in which the degree in the right eye is -2D in one meridian and Emmetropic in the other; whilst the left eye is - 4.5D in one meridian and Emmetropic in the other.

This group is so small that one is unable to come to any conclusion. (See appendix 5. Pages 2 & 3.)

Compound Myopic Astigmatism, 38 cases.

As in the case of Compound Hypermetropic Astigmatism I have divided this group into 4 sub-groups. There are 6 cases (4 boys and 2 girls) which do not come in the sub-groups. Of the remaining 32 cases, 15 are boys & 17 girls.

Sub-groups.

(1) Small Spherical $\bar{c}$ Small Astig.

In this group the "small spherical" is when the degree of Myopia in the lowest refracting meridian is - 3D degrees or under; whilst the "small astigmatism" is when the highest refracting meridian is - 3D degrees or under added to the other meridian. Those cases where the amount of Astigmatism is only - 0.5D I have placed in a separate group.

(2) Small Spherical $\bar{c}$ Large Astig.

The "small spherical", as in the former group, is when the lowest refracting meridian is equivalent to - 3D degrees or under of Myopia; whilst the most highly refracting meridian is over - 3D degrees added to the other meridian, i.e., there is more than - 3D degrees of Astigmatism on the top of the less refracting meridian.

(3) Large Spherical $\bar{c}$ Small Astig.

This is when the lowest refracting meridian is equivalent to over - 3D degrees of Myopia; whilst the highest refracting meridian is not more than - 3D degrees added to that of the other meridian. As in group 2, I have separated those cases in which there is only - 0.5D degrees of Astigmatism.

(4) Large Spherical $\overline{c}$ Large Astig.

As in group 3, the "large spherical" is when the lowest refracting meridian is equivalent to over - 3D of Myopia, whilst the highest refracting meridian is over - 3D degrees added to the degree of the lowest refracting meridian.

Degree			Total
Small Spherical (- 3D & under) $\overline{c}$ Small Astig. (- 3D & under)	- 0.5D	1 boy 1 girl	2
		5 boys 6 girls	11
Small Spherical (- 3D & under) $\overline{c}$ Large Astig. (over - 3D)		2 boys 1 girl	3
Large Spherical (over - 3D) $\overline{c}$ Small Astig. (- 3D & under)	- 0.5D	-	
		3 boys 8 girls	11
Large Spherical (over - 3D) $\overline{c}$ Large Astig. (over - 3D)		4 boys 1 girl	5
		TOTAL	32

From the above table it is at once seen that the group Small Spherical $\overline{c}$ Small Astig. is practically of the same number as that of Large Spherical $\overline{c}$ Small Astig.; whilst the group Small Spherical $\overline{c}$ Large Astig. is only about $\frac{1}{4}$ of either of the above groups. The Large Spherical $\overline{c}$ Large Astig. is just about $\frac{1}{6}$ of the whole.

(See appendix 5. Pages 4+5.)

Myopia $\overline{c}$ Myopic Astig: Compound, 14 cases. (8 boys and 6 girls). As in the case of Hypermetropia $\overline{c}$ Hyper: Astig: Compound, I have divided this group into two main sub-divisions.

(1) Those cases in which the right eye is Myopic, and the left eye Myopic Astig: Compound.

(2) Those cases in which the left eye is Myopic, and the right eye Myopic Astig: Compound.

In sub-division 1, (in which the right eye is Myopic) I find 5 cases (2 boys and 3 girls).

In sub-division 2, (in which the left eye is Myopic) there are 9 cases (6 boys and 3 girls).

See following tables for degree. (See also appendix 5. Pages 6+7)

Here it will be seen that there are a greater number in which the left eye is Myopic pure and simple.

TABLE SHOWING THE DEGREE OF MYOPIA IN THE RIGHT EYE, WITH THE DEGREE OF MYOPIC ASTIG: COMPOUND IN THE LEFT.

Myopia. Right eye. Degree.		Total.	Comp: Myopic Astig: Left eye. Small Sph: $\overline{c}$ Small Astig: −0.5 of Astig.	Small Sph: $\overline{c}$ Small Astig:	Small Sph: $\overline{c}$ Large Astig:	Large Sph: $\overline{c}$ Small Astig:	Total.
− 1D	1 girl.	1	1				1
− 2D	1 boy.	1		1			1
−3D	1 girl.	1	1				1
− 5D	1 girl.	1			1		1
−11D	1 boy.	1				1	1
Total		5					5

TABLE SHOWING THE DEGREE OF MYOPIA IN THE LEFT EYE, WITH THE DEGREE OF MYOPIC ASTIG: COMPOUND IN THE RIGHT.

Compound Myopic Astig: Right eye.

Myopia. Left eye. Degree.		Total.	Small Sph: / C Small Astig: −0.5 of Astig.	Small Sph: / C Small Astig:	Large Sph: / C Small Astig:	Large Sph: / C Large Astig:	Total.
− 1D	1 boy.	1	1				1
− 2D	1 boy. 1 girl.	2	1	1			2
− 3D	1 boy.	1				1	1
− 4D	1 girl.	1			1		1
− 5D	2 boys. 1 girl.	3				3	3
− 8D	1 boy.	1				1	1
	Total.	9					9

Mixed Astigmatism.

This is when the principal focus of one meridian lies in front of the retina, and the other behind the retina. Berry in Diseases of the Eye page 544 says "Mixed Astigmatism occurs much less frequently than the other forms of Astigmatism".

According to some, Hypermetropic Astigmatism is more common than Myopic Astigmatism, whilst others have found the two about equally prevalent.

In this group the cases number 90 (35 boys & 55 girls). These I have divided into 6 sub-divisions.

(1) Mixed Astigmatism.

The cases in which both eyes were Myopic in one meridian and Hypermetropic in the other, i,e, the focus of rays in passing through the most highly refracting meridian of the Cornea is situated in front of the retina; whilst the focus of rays in passing through the least refracting meridian is situated behind the retina. There are 51 cases belonging to this sub-group, (56.6%).

(2) Hypermetropia $\bar{c}$ Mixed Astigmatism, 2 cases (2.2%).

This is when one eye is Hypermetropic, and the other has Mixed Astigmatism.

(3) Simple Hyper: Astig: $\bar{c}$ Mixed Astig: 11 cases(12%)

Those cases in which one eye had Simple Hyper: Astig:, and the other eye Mixed Astig:

(4) Compound Hyper: Astig: $\bar{c}$ Mixed Astig:

One eye Compound Hyper: Astig:, and the other Mixed Astig:. 12 cases (13.3%).

(5) Simple Myopic Astig: $\bar{c}$ Mixed Astig:3 cases(3.3%)

One eye Simple Myopic Astig:, and the other eye Mixed Astig:.

(6) Compound Myopic Astig: $\bar{c}$ Mixed Astig:

One eye Compound Myopic Astig:, and the other eye Mixed Astig: 11 cases (12.2%).

Percentage of Mixed Astigmatism.

(1)	Mixed Astigmatism.	51 cases.	(56.6%)
		22 boys.	(24.4%)
		29 girls.	(32.2%)
(2)	Hypermetropia c Mixed Astig:	2 cases.	(2.2%)
		2 boys.	(2.2%)
(3)	Simple Hyper: Astig: c Mixed Astig:	11 cases.	(12.2%)
		2 boys.	(2.2%)
		9 girls.	(10%)
(4)	Comp: Hyper: Astig: c Mixed Astig:	12 cases.	(13.3%)
		5 boys.	(5.5%)
		7 girls.	(7.7%)
(5)	Simple Myopic Astig: c Mixed Astig:	3 cases.	(3.3%)
		1 boy.	(1.1%)
		2 girls.	(2.2%)
(6)	Comp: Myopic Astig: c Mixed Astig:	11 cases.	(12.2%)
		3 boys.	(3.3%)
		8 girls.	(8.8%)

In the sub-group where Mixed Astigmatism occurs in both eyes, it is noticed that there are no cases at the age of 5, and the greater proportion occurred at the ages of 9 and 10 years. (See following table). (See appendix 2+3. Page 3.)

Where Mixed Astigmatism occurred in one eye, and either Hypermetropia pure and simple, or Simple Hyper: Astig:, or Compound Hyper: Astig: in the other eye, the greater proportion occurred at the ages of 10, and 11 years; (5 at 10 years & 6 at 11 years, out of 25 cases).

Ten other cases being equally distributed between the ages of 6 and 9 years. (See following table.)

In the sub-groups where Mixed Astigmatism occurred in on eye, and Myopic Astig: Simplex, or Myopic Astig: Compound, in the other eye, practically all the cases occurred between the ages of 9 & 12 years; only one case occurring before this age.

MIXED ASTIGMATISM.

(Showing ages.)

Ages:-	5	6	7	8	9	10	11	12	13
Mixed Astig: (Both eyes)		3	6	6	13	9	6	7	1
Mixed Astig: c Hypermetropia (All forms)		2	2	3	3	5	6	1	3
Mixed Astig: c Myopia. (All forms)			1		3	4	1	4	1

It seems to me that the group"Mixed Astigmatism" appears to be a sort of intermediate stage between Hypermetropia and Myopia; for most authorities are agreed that Hypermetropia is the normal condition in childhood, and that the tendency is for the eye in some cases to pass on to Myopia.

I certainly think that this is the bridge over which the change does take place, and upon the question of how this is effected, I intend giving some observations in a group which is labelled -

"Interesting Cases" (See section 4 of paper)

It is almost impossible to give any tables with the degree of errors of refraction in Mixed Astigmatism.

I find that in the sub-group where there was Mixed Astigmatism in both eyes that the Myopic meridian was vertical in 48 cases out of the 51. In only 2 cases was the Myopic meridian in the horizontal plane in both eyes; whilst one case, in which the Cornea was very irregular in the left eye, the Myopic meridian was horizontal; and in the right eye the Myopic meridian was vertical.

In the Hyper: $\overline{c}$ Mixed Astig: sub-group there were 2 cases and in both, the Mixed Astigmatism was in the left eye, the Myopic meridian was vertical.

In the Simple Hyper: Astig: $\overline{c}$ Mixed Astig: sub-group there were 11 cases; 6 of these had Mixed Astig: in the right eye, with the Myopic meridian vertical, 3 had Mixed Astig: in the left eye, with the Myopic meridian vertical; whilst the remaining 2 had Mixed Astig: in the left eye, and the Myopic meridian horizontal.

In Compound Hyper: Astig: $\overline{c}$ Mixed Astig: there were 12 cases; 7 of these had Mixed Astig: in the right eye, with the Myopic meridian vertical, 3 had Mixed Astig: in the left eye, with the Myopic meridian vertical, whilst 1 case had Mixed Astig: in the left eye, with the Myopic meridian horizontal. The remaining case had Mixed Astig: in the right eye, with the Myopic meridian horizontal.

In Simple Myopic Astig: $\bar{c}$ Mixed Astig: sub-group there were 3 cases, 1 of these had Mixed Astig: in the right eye, with the Myopic meridian vertical, the remaining 2 had Mixed Astig: in the left eye, with the Myopic meridian horizontal.

In Compound Myopic Astig: there were 11 cases. The Mixed Astig: was in the left eye and the Myopic meridian was vertical in 8 of these, in the remaining 3 the Mixed Astig: was in the right eye, with the Myopic meridian vertical.

From the foregoing statement it will be seen that only 9 cases, of the 90 comprising this group, have the Myopic meridian horizontal; the remaining 81, having the Myopic meridian vertical.

Hypermetropia $\bar{c}$ Myopia 5 cases.

There is one form or other of Hypermetropia in one eye, whilst in the other eye one form or other of Myopia. (See appendix 2 + 3. Pages 4.)

(1) Hypermetropia Simplex in one eye, and Myopia Simplex in the other eye, 3 cases, - 2 at 7 years, a boy and a girl, and a girl at 9 years.

(2) Compound Hypermetropia in one eye, and Compound Myopic Astig: in the other eye, 1 case, a girl at 9 years.

(3) Myopia in one eye, and Simple Hyper: Astig: in the other eye, 1 case, a boy at 11 years.

It is interesting to note that all these cases occur between the ages of 7 and 11 years, and again it emphasises the necessity of having each eye

examined separately. If one eye only had been examined, it might have been thought to be a case of Hypermetropia, or if the other eye only had been examined, a case of Myopia.

Emmetropia or Normal.

In Emmetropia or Normal refraction, parallel rays are brought to a focus on the layer of rods and cones of the retina, and form there a distinct inverted image of the point or object from which they come.

Of the 725 cases examined under Homatropine, only 5 cases turned out to be Emmetropic, and consisted of 2 boys and 3 girls. (See appendix 2+3. Pages 4+5.)

(1) Asthenopia - Accommodative, one boy 9 years old, 3 girls at 7, 12, and 13 years respectively.

(2) Conjunctavitis, one case.

This was of a persistent character, so Homatropine was dropped into the eye, the retinoscopy taken, and found to be Emmetropic.

Accommodative Asthenopia.

This is when the Ciliary muscle of the eye gets tired due to over strain and you get cramp of this muscle, so the eye is unable to sustain accommodative efforts for near objects for any length of time. This condition often appears quite suddenly, or after a severe illness. It improves temporarily upon resting the eyes; also, it has improved after a Sunday, due to that days rest.

It is interesting to note (see following table) that the cases in all the different groups of Hypermetropia, are the greatest sufferers from Spasm of Accommodation. The reason given for this is, that the Ciliary muscle in health (in Hypermetropia) is equal to the effort required of it; but in sickness it shares the debility of the system, with the result that it is unable to act, and the symptoms mentioned above become manifest.

The following table may not be absolutely accurate, yet it will serve the purpose of laying stress upon this important condition (Spasm of Accommodation), and I think that this alone justifies the use of Mydriatics in taking errors of refraction in children.

These children were not examined with the view of making any special investigation, but just examined in the ordinary routine way of the Hospital, and my investigation into these cases in regard to "Spasm " is based upon the following factors:-

(1) Those cases where I found (after the visual acuity had been taken) there was no improvement by the addition of concave or convex glasses, but that they were proved to be Hypermetropic or Myopic, after retinoscopy under Homeatropine, then after wearing correcting glasses for a short period the visual acuity improved.

(2) Where glasses had been prescribed of the proper correction and there was very little improvement in the visual acuity, but by the use of Liq: Atrop: and the correcting glasses for a week or two, the vision decidedly improved.

(3) In some cases where the visual acuity was found to be improved by concave lenses on the first visit, and eventually they proved to be Hypermetropic.

I felt justified in collecting all these cases and including them under the heading of "Spasm of Accommodation", and have tabulated them. (See appendix 8.)

		Total.
Hypermetropia	16 boys. 16 girls.	32
Hyper: Astig: Compound.	14 boys. 25 girls.	39
Hypermetropia c Hyper: Astig: Compound.	7 boys. 13 girls.	20
Hypermetropia c Myopia.	1 boy. 1 girl.	2
Myopia.	3 boys. 4 girls.	7
Myopic Astig: Compound.	2 boys. 1 girl.	3
Mixed Astigmatism.	1 boy. 1 girl.	2
Hypermetropia c Mixed Astig:	1 girl.	1
Emmetropia.	1 boy. 3 girls.	4
		110.
	Total. 65 boys. " 45 girls.	

It will be seen that Hyper: Astig: Compound has the largest number of cases; then Hypermetropia Simplex; following this, Hypermetropia in one eye and Hyper: Astig: in the other eye.

The Hypermetropes having in all 91 out of a total of 110 cases suffering from Spasm of Accommodation.
Myopia in all its sub-groups having only 12 cases.
Mixed Astigmatism 3 cases.
Hypermetropia in one eye, and Myopia in the other 1 case.
Normal vision 4 cases.

One fact which was very noticeable was, that after 7 years old up to 12 years the cases were more numerous, and it only bears out the fact which has been before mentioned, that at about the ages of 9, 10, and 11 years, the strain upon the eyesight of children must be enormous.

It certainly seems to me necessary that further efforts than are taken at the present time, should be taken, to preserve the eyesight of our children.

Ages:-	5	6	7	8	9	10	11	12	13	Total
Boys.	2	1	6	6	10	6	9	3	2	45
Girls.		1	2	4	11	15	13	13	6	65
Total.	2	2	8	10	21	21	22	16	8	110.

Another factor is the large proportion of girls who suffer from trouble with their eyesight. Why ? Is it that girls are less robust and so unable to withstand the strain of school life ? or, is it that girls are less likely to let their minds wander from their work ? and so with the continued use of their eyes get Spasm of Accommodation and its accompanying trouble.

In the table given below I am endeavouring to give a percentage of each of the different groups into which the 725 cases were sub-divided, so that at a glance can be told the proportion of one sub-group to the other.

	(Simple)	Simple Astig:	Compound Astig:	(Simple) c Comp: Astig:	Simple Astig c Comp: Astig:	(Simple) in one eye + Emmetropia in other eye.	(Simple) in one eye c Irregular Cornea.	
	10.758	.965	14.758	5.103	.551	.137	.137	Boys %
Hyper:	11.448	1.517	21.517	5.379	.965		.137	Girls%
	22.206	2.482	36.275	10.482	1.517	.137	.275	Total%
	1.793	.551	2.206	1.103	.413			Boys %
Myopia	1.793	.827	3.034	.827	.137	.137		Girls%
	3.586	1.379	5.241	1.931	.551	.137		Total%

MIXED ASTIGMATISM.

			Total %
Mixed Astigmatism	Boys. Girls.	3.034% 4%	7.034%
Hypermetropia c Mixed Astig:	Boys.	.275%	.275%
Simple Hyper: Astig: c Mixed Astig:	Boys. Girls.	.275% 1.241%	1.517%
Comp: Hyper: Astig: c Mixed Astig:	Boys. Girls.	.689% .965%	1.655%
Simple Myopic Astig: c Mixed Astig:	Boys. Girls.	.137% .275%	.413%
Comp: Myopic Astig: c Mixed Astig:	Boys. Girls.	.413% 1.103%	1.517%

HYPERMETROPIA c MYOPIA.

			Total %
Hypermetropia c Myopia.	Boys. Girls.	.137% .275%	.413%
Comp: Hyper: Astig: c Comp: Myopic Astig:	Girls.	.137%	.137%
Myopia c Simple Hyper: Astig:	Boys.	.137%	.137%

EMMETROPIA.

			Total %
Asthenopia.	Boys. Girls.	.137% .413%	.551%
Conjunctivitis.	Boys.	.137%	.137%

S E C T I O N 5.

" CASES OF INTEREST ".

PAGES 73 to 78.

CASES OF INTEREST.

Under this heading I have brought together a number of cases which I consider will throw some light upon the relationship of Hypermetropia to Myopia.

Unfortunately the chain of evidence is not altogether complete, yet it certainly serves the purpose of giving a very good indication of the change which does take place in the eyes of children.

Several of the children who had been examined, returned at a later period and had their eyes re-examined by Retinoscopy, and it is upon these cases which I intend basing my remarks.

Most of the modern observers are quite agreed that Hypermetropia is the normal condition of the eyes of babies and young children, and in none of the cases which came again for re-examination was it noticed that the degree of Hypermetropia had at all increased; but in several cases it had certainly considerably diminished.

For example take case 810, a girl aged 9. At this age her Retinoscopy was as follows:-

Right eye. + 5.5 / + 3.5 Left eye. + 4 / + 7

Retinoscopy at 11 years old:-

Right eye. + 4 / + 1 Left eye. + 2 / + 4

Case 969, a girl aged 9. At this age her Retinoscopy was as follows:-

Right eye. + 1.5 / + 5 Left eye. + 1.5 / + 5

Retinoscopy at 11 years old:-

Right eye. E / + 5 Left eye. E / + 3

These were 2 clear cases where evidently the antero-posterior axis of the eye had increased, and by so doing had reduced the amount of Hypermetropia.

Then again take the case of 426 a girl aged 9. At this age her Retinoscopy was as follows:-

Right eye. + 1 / + 5 Left eye. + 1 / + 5

Retinoscopy at 12 years old:-

Right eye. + 0.5 / + 5 Left eye. Em / +4.5

Evidently what happens in Hypermetropia when any change does take place, is the tendency for the eye to elongate and so eventually to become Emmetropic in one meridian and Hypermetropic in the other, - in other words, it becomes Simple Hyper: Astigmatism.

I also found other cases bearing upon this important point.

Take case 219, a girl aged 13. At this age her Retinoscopy was as follows:-

Right eye. Em +3 Left eye. Em +3.5

Retinoscopy at 15 years old:-

Right eye. -1.5 +1 Left eye. -2.5 +1

Here we notice that the meridian which was Hypermetropic at first, has on re-examination 2 years later, a less degree of Hypermetropia; whilst the meridian which was Emmetropic, has gradually become Myopic.

Other cases which bear out a similar inference are given below:-

Case 1049, a girl aged 12. At this age her Retinoscopy was as follows:-

Right eye. -1 +1 Left eye. -.5 +1

Retinoscopy at 13 years old:-

Right eye. -1.5 Em Left eye. -2 -1.5 or -1

Case 371, a boy aged 10. At this age his Retinoscopy was as follows:-

Right eye. -.5 +2.5 Left eye. -2 +0.5

Retinoscopy at 11 years old:-

Right eye. -1.5 +2.5 Left eye. -4 -1

Case 578, a girl aged 8. At this age her Retinoscopy was as follows:-

Right eye. -1 +1.5 Left eye. -1 +1.5

Retinoscopy at 9 years old:-

Right eye. -2.5 -0.5 Left eye. -2 +0.75

Case 1038, a boy aged 8. At this age his Retinoscopy was as follows:-

Right eye. +1.5 -0.5 Left eye. +2 +0.5 or +1

Retinoscopy at 11 years old:-

Right eye. -0.5 -2.5 Left eye. -1D

Case 223, a girl aged 9. At his age her Retinoscopy was as follows:-

Right eye. -3.5 Em Left eye. -4.5 -0.5

Retinoscopy at 10 years old:-

Right eye. -4 -0.5 Left eye. -4.5 -1.5

The foregoing cases give us a very good clue as to what happens in very many eyes.

First one meridian of the Hypermetropic eye becomes Emmetropic and then gradually becomes Myopic (Mixed Astigmatism).

Whilst this is taking place in the one meridian, the Hypermetropia in the other meridian is gradually diminishing; and by carefully examining the above cases the different steps are seen. After this we find that the eye still goes on elongating so we get Myopia in one form or another, and eventually the case may develope into one of High Myopia.

The following cases are examples of how the elongation progresses:-

Case 79, a boy aged 7. At this age his Retinoscopy was as follows:-

Right eye. -7 / -2 Left eye. -8 / -2.5

Retinoscopy at 10 years old:-

Right eye. -9 / -3.5 Left eye. +9 or +10 / -4

Case 796, a girl aged 10. At this age her Retinoscopy was as follows:-

Right eye. -4 Left eye. -4

Retinoscopy at 13 years old:-

Right eye. -7 Left eye. -7

Case 1009, a girl aged 8. At this age her Retinoscopy was as follows:-

Right eye. -10 -9 Left eye. -4 -3.5

Retinoscopy at 11 years old:-

Right eye. -12to -14 -12 Left eye. -6 -6

Retinoscopy at 12 years old:-

Right eye. -13 -14 Left eye. -8 -7

If I may be allowed to deduct, or to draw an inference from the above list of cases, although somewhat incomplete or insufficient, I think it will be as follows:-

That in a certain number, the eye does, without doubt, have a tendency to elongate, so a Hypermetropic eye may become a Myopic eye; not as suggested by Cohn, - that at one time the eye becomes Emmetropic, them Myopic, - but rather as described by Professor Risley (who also quotes work done by Dr. W.F. Norris) that it is over the bridge of Astigmatism that the change does take place.

After the foregoing, I think we may safely conclude that the Hypermetropic eye becomes Emmetropic in one meridian, and of less degree of Hypermetropia in the other meridian. The Emmetropic meridian gradually becoming Myopic, thus you get Mixed Astigmatism; the Hypermetropic meridian gradually passing into Emmetropia and Myopia.

S E C T I O N 6.

DESCRIPTION OF COMPLICATIONS OF GROUP 2.

PAGES 79 to 111.

COMPLICATIONS OF THE 725 CASES IN WHICH ATROPINE OR HOMATROPINE WAS USED AND RETINOSCOPY TAKEN.

(For sub-groups see appendix 6 & 7).

Hypermetropia.		Myopia.		Mixed Astig:		Hyper:c̄ Myopia.	
Conjunctivitis.	28	Conjunct:	4				
Phlyctenular Ophthalmia.	6	Phlyct: Ophth:	1				
Blepharitis.	49	Blepharitis.	7	Blepharitis	13		
Marginal Keratitis.	5	Marginal Keratitis.	1	Marginal Keratitis.	1		
Keratitis.	7	Keratitis.	1	Keratitis.	1		
Maculae & Nebulae.	11	Maculae & Nebulae.	1	Maculae & Nebulae.	6		
Ulcer of Cornea.	10						
Blepherospasm.	7						
Conv: Conc: Strabismus.	61	Conv: Conc: Strabismus.	1	Conv: Conc: Strabismus.	3		
Left Internal Strabismus.	50			Left Internal Strabismus.	1		
Right Internal Strabismus.	30	Right Internal Strabismus.	1	Right Internal Strabismus.	1		
Divergent Strabismus.	5						
Left Divergent Strabismus.	1	Left Diverg: Strabismus.	1				
		Right Diverg: Strabismus.	3	Right Diverg: Strabismus.	1		
Meibomian Cysts	1						
Conical Cornea.	1						
Congenital Cataract.	2			Congenital Cataract.	1		
Triangular Opacity of Lens.	1			Anterior Polar Cataract.	1		
Ptosis.	3						
Clonic Contract: of Orbicularis.	1						

Hypermetropia.		Myopia.		Mixed Astig:		Hyper: c̄ Myopia.	
Dermoid.	1			Hordeolus	1	Hordeolus	1
Nystagmus.	2	Nystagmus.	2	Nystagmus.	3		
Photophobia. No Inflammation.	1	Lacrymal Abscess.	1				
Mentally Deficient due to injury.	1						
Amblyopia.(Left)	15						
Amblyopia.(Right)	13			Amblyopia ((Right)	1		
Haziness of Vitreous.	1			Haziness of Vitreous.	1		
Coloboma of Choroid.	1			Hyalitis.	1		
Changes at Maculae.	4			Albino.	1		
Optic Atrophy.	3	Optic Atrophy	2	Optic Atrophy	1		
Choroidal Changes. (Crescents etc)	2	Choroidal Changes.	22	Choroidal Changes.	8	Choroidal Changes.	1
Congested Discs.	5	Congested Discs.	3	Dark Fundi.	1		
Cupping of Discs.	1	Cupping of Discs.	1				
Black ring at Disc.	1			"Bad Stomach"	1		
Curved edge of Disc.	1						
Medulated Nerve Fibres.	1	Medulated Nerve Fibres.	2				
Outline of O.D. indistinct.	2	Grey Optic Disc.	1				
Old Iritis.	1	Extraction for High Myopia.	1	Wound of Cornea with Prolapse of Iris.	1		
Vertigo.	1						
Pain in Eyes.	8						
Pain in Head.	32	Pain in Head.	1	Pain in Head	1		

From the foregoing list of complications, it is at once quite obvious that those cases in the different groups of Hypermetropia are greater sufferers than those of any other group from inflammatory conditions of either the eyelids, Conjunctiva, or Cornea. In the case of Strabismus, it is at once evident that certainly in regard to the Convergent forms, Hypermetropes have by far the largest proportion of cases.

In regard to pain in the head and eyes, although I am afraid that this question has not been gone into very fully with the patient, it is evident that the Hypermetropes are the greatest sufferers. In those cases in which Amblyopia was noted in either one or the other eye, Hypermetropes have by far the largest proportion, in fact, only one case was noted which did not come under the heading of Hypermetropia. This patient had Mixed Astigmatism in one eye, and Compound Hyper: Astig: in the other eye.

In the Myopic group Choroidal Changes were far and away the most numerous. Next in order came the Mixed Astigmatism; whilst of the 5 cases forming the group Hyper: $\bar{c}$ Myopia, one case had Choroidal Changes.

Of the 532 cases of Hypermetropia there were only 2 cases in which Choroidal Changes were noted.

Conjunctivitis.

It is worthy of note that Conjunctivitis in one form or another makes up a total of 32 cases (15 boys and 17 girls), and 13 of these (6 boys and 7 girls) occurred in Hypermetropia pure and simple; whilst in Hyper: Astig: Compound there were 10 cases (3 boys and 7 girls).

In Hyper: $\bar{c}$ Hyper: Astig: there were 4 cases (2 boys and 2 girls).

In Simple Hyper: Astig:, only 1 case, a boy, was recorded.

The above make a total of 28 (12 boys and 16 girls).

In the Myopic group, only 4 cases had Conjunctivitis, - one girl in the Myopic Astig: Simplex sub-group, one boy in the Myopic Astig: Comp: sub-group, and two boys in the Myopic $\bar{c}$ Myopic Astig: sub-group.

From the above statement it is at once obvious that Hypermetropes were the greater sufferers from this condition.

It has been suggested that the inflammatory conditions found in Hypermetropia are caused by the chuld's eyes becoming tired, due to the continual strain put upon the Ciliary muscle, he then rubs them, and in so doing inoculates the Conjunctiva, or Cornea, etc, with some germ.

Phlyctenular Ophthalmia.

This condition has undoubtedly something to do with the errors of refraction, although it occurs mostly in Strumous children. In two or three of these cases relapses were noticed, but on the child having had glasses prescribed, no relapse was recorded.

Of the 7 cases (2 boys and 5 girls) which occurred as a complication, I find that 6, (2 boys and 4 girls) were Hypermetropes, and were distributed as follows:-

Hypermetropia pure and simple 3 cases (1 boy & 2 girls).

Hyper: Astig: Compound, 2 girls.

Hyper: $\overline{c}$ Hyper: Astig: 1 boy.

In the Myopic group there was only 1 case out of the 7, and this occurred in the sub-group Myopia pure and Simple.

This certainly points out the necessity of having every case of Phlyct: Ophthalmia carefully examined under Homatropine, for I feel certain that if very many of these cases (numbering 57) which were simply treated by local applications and Syr: Ferri Iodidi, had been examined under Atropine they would have been found to have had some error of refraction, which if corrected, would have prevented many of the relapses.

In regard to the age of the patients, nothing special was noted.

Blepharitis or Tinea Tarsi.

It has already been pointed out that this condition is very frequently associated with (as in these cases) Conjunctivitis or Phlyct: Ophthalmia. The total number of cases amounted to 69 (24 boys & 45 girls) and were noted at the following ages:-

3	cases	at	5	years.	12	cases	at	10	years.
10	"	"	6	"	11	"	"	11	"
8	"	"	7	"	6	"	"	12	"
5	"	"	8	"	2	"	"	13	"
12	"	"	9	"					

From the above table it is at once seen that the majority of cases of Blepharitis occur about the ages of 9, 10, and 11 years.

Of the children suffering from all forms of Hypermetropia, Blepharitis occurred in 49 cases (16 boys and 33 girls).

Hypermetropia Simplex contributing 20 cases (9 boys and 11 girls).

Hyper: Astig: Simplex 2 girls.

Hyper: Astig: Compound 20 cases (5 boys & 15 girls).

Hyper: $\overline{c}$ Hyper: Astig: Compound 6 cases (2 boys and 4 girls).

Simple $\overline{c}$ Compound Hyper: Astig: 1 girl.

Only 7 cases of Blepharitis (2 boys and 5 girls) were noted in the Myopic group, and of these, one case a girl, occurred in the sub-group Myopic Astig: Simplex.

In Myopic Astig: Compound 5 cases (2 boys and 3 girls).

In Myopia $\bar{c}$ Myopic Astig: 1 girl.
In the Mixed Astig: sub-group 13 cases were found (4 boys and 9 girls).

The remarks which were made in regard to Conjunctavitis are equally applicable to this group; and it was noticed time and again that in children who had come repeatedly for Blepharitis, errors of refraction were eventually noted.

It is also interesting to note that again girls appear to be the greater sufferers.

Blepherospasm or Spasmodic closure of the eyes.

This may be constant, or intermittent. The constant cases are associated with photophobia and some diseased condition of the Conjunctiva. The intermittent are very rare, mainly caused by irritation of the facial nerve. Unfortunately in the Diagnosis, Blepherospasm only is recorded, and not any clue given as to the true cause; but it is of interest to note that there were 7 cases (2 boys and 5 girls), all of which occurred in the Hypermetropic group, and were as follows:-

Hypermetropia Simplex, 4 cases (2 boys and 2 girls).
Hyper: Astig: Simplex 1 girl.
Hyper: Astig: Compound 2 girls.

Hordeolum , or Stye.

This has already been described under the group which was not Atropinised.
There are 2 cases, - 1 in the Mixed Astigmatism group a boy 12 years, and one in the Hyper: $\bar{c}$ Myopic group, a girl 10 years.

Ptosis.

This condition is the inability to raise the upper lid, and may be due to deficiency of the muscle itself or to paralysis of the nerve supply.

There were 3 cases noted, and 2 of these (1 girl 5 years and 1 boy 6 years) had Congenital Ptosis of both eyes, and they came under the Hyper: Astig: Compound group. The other with Ptosis of left eye (1 boy 9 years) also came under the Hyper: Astig: Compound group.

Clonic Contraction of the Orbicularis.

This was noted in a boy of 10 years, and was in the group Compound Hyper: Astig:.

Lacrymal Abscess.

Dacryo-cystitis is the name for any inflammation of the Lacrymal Sac. If the inflammation involves the tissues surrounding, a true abscess is formed. This condition occurred in one case, a girl 8 years, and was in the group Myopia $\bar{c}$ Mixed Astig:.

Corneal Affections.

The different complications which were noted in the Cornea were:-
Marginal Keratitis, Keratitis, Ulcers of Cornea, Maculae and Nebulae, and one case of Conical Cornea. There were 46 cases (18 boys and 28 girls).

Marginal Keratitis.

This was described under the other group which had not been Atropinised, and consisted of 7 cases (4 boys and 3 girls), they occurred in:-

Hypermetropia Simplex, 2 cases (1 boy and 1 girl).

Hypermetropic Astig: Compound, 2 cases (1 boy and 1 girl).

Hyper: $\frac{}{c}$ Hyper: Astig: 1 boy.

Myopic Astig: Compound, 1 girl.

Mixed Astig: 1 boy.

It is interesting to note that 5 out of the 7 cases were in the Hypermetropic group.

Keratitis.

There were 9 cases (2 boys and 7 girls) and distributed as follows:-

Hypermetropia.	2 cases 2 girls.
Hyper: Astig: Compound.	4 cases. 2 boys. 2 girls.
Hyper$\frac{}{c}$metropia Hyper: Astig:	1 case. 1 girl.
Myopic Astig: Compound.	1 case. 1 girl.
Comp: Hyper$\frac{}{c}$: Astig: Mixed Astig:	1 case. 1 girl.

Here again 8 cases out of 9 were Hypermetropic.

Maculae and Nebulae.

There were 18 cases (5 boys & 13 girls), and distributed as follows:-

Hyper: Astig: Simplex.	1 case	1 girl.
Hyper: Astig: Comp:	6 cases.	3 boys. 3 girls.
Hypermetropia c Hyper: Astig:	4 cases.	4 girls.
Myopia.	1 case.	1 girl.
Myopic Astig:	3 cases.	1 boy. 2 girls.
Hypermetropia c Mixed Astig:	1 case.	1 girl.
Comp: Hyper: Astig: c Mixed Astig:	1 case.	1 boy.
Myopic Astig: c Mixed Astig:	1 case.	1 girl.

The above table shows that Hypermetropia had the largest number, 11 cases. Next, Mixed Astigmatism, 6 cases. Myopia had only 1 case.

Ulcer of Cornea.

This disease occurred in 11 cases (6 boys & 5 girls) out of the 725, and were distributed as follows:-

Hyper: Astig: Compound.	6 cases.	3 boys. 3 girls.
Hypermetropia c Hyper: Astig:	4 cases.	3 boys. 1 girl.
Retinoscopy Impossible.	1 case.	1 boy.

Conical Cornea. One case, a girl 10 years old.

From the foregoing analysis it will be quite clear that the majority of Corneal diseases occur undoubtedly, in Hypermetropes, and that girls are the greater sufferers.

In regard to the ages nothing special was noted.

Diseases of Lens etc.

Congenital Cataract, or Opacity of Lens.

This condition was noted in 4 cases, 1 boy aged 10 who had Hypermetropia, another boy who had Simple Hyper: Astig: in one eye, and Comp: Hyper: Astig: in the other eye. One case, (a girl aged 9) in which white spots were noticed at the posterior pole of the lens, and discs cupped. In a boy aged 8, there was noticed a triangular opacity of both lenses, and he came under the group Hyper: Astig: Compound.

Disease or Injury to Iris.

Case of Old Iritis in a boy aged 10, there being bands from right eyelid to lens. He had Simple Hyper Astig: in one eye, and Comp: Hyper: Astig: in the other eye; whilst in a boy aged 8 (in the Mixed Astig: group) there was a wound of left Cornea with prolapse of Iris.

Diseases of the Vitreous, 2 cases, both girls.

One of these, a girl aged 11, had Hyalitis, and came in the group Simple Hyper: Astig: $\overline{c}$ Mixed Astig:. The other, a girl aged 12, with Haziness of Vitreous was in the Hypermetropic group.

In the case with Hyalitis all that was noted was, - in the right eye the Vitreous was turbid, and there were floaters; whilst in the left eye the Vitreous was a trifle turbid. The treatment consisted in giving Liq: Hyd: Perchlor: $\bar{c}$ Pot: Iod: Glasses at first did not improve, but at the last visit it was noted that the patient was doing "nicely" - evidently this condition was of Syphilitic origin.

The case of Haziness of Vitreous, was in the left eye, but no treatment was notified in the case book.

Changes in Fundus etc.

Coloboma of Choroid is a congenital defect, and is frequently associated with some other congenital defect.

In the case recorded in the Hyper: Simplex sub-group, this occurred in the left eye of a girl aged 8.

Streaky Appearance at Maculae.

One boy aged 13, in the Hypermetropic group.

White Spots at Maculae.

One girl aged 10, in the Hyper: Astig: Compound group; and another girl aged 10, in the Hypermetropic group.

Red Spots at Maculae in a boy aged 11, Hyper: group.

Choroidal Changes, 33 cases (19 boys & 14 girls).

Hyper: Astig: Compound.	1 case. 1 girl.
Simple and Compound Hyper: Astig:	1 case. 1 girl.
Myopia Simplex.	1 case. 1 boy.
Myopic Astig:	2 cases. 1 boy. 1 girl.
Myopic Astig: Compound.	12 cases. 4 boys. 8 girls.
Simple & Compound Myopic Astig:	2 cases. 2 boys.
Myopia c Myopic Astig:	5 cases. 4 boys. 1 girl.
Mixed Astig:	4 cases. 2 boys. 2 girls.
Myopic Astig: c Mixed Astig:	4 cases. 3 boys. 1 girl.
Hyper: $\overline{c}$ Myopia.	1 case. 1 boy.

Berry in "Diseases of the Eye" page 538, says:- "There is frequently an ophthalmoscopic appearance to be met with in the Myopic eye, which, although not absolutely characteristic of this state of refraction, is more frequently connected with it than with such as are due to a less elongated form of antero-posterior axis. The appearance referred to is that of a white patch, usually concentric in shape, immediately to the outer side of the entrance of the Optic nerve. This patch is due to an absence of some, or all, of the layers of the Choroid in this situation,

and a consequent reflection of more or less light by the white sclera."

It is spoken of as the Myopic Crescent.

The above cases fully bear out the statements made by Berry.

It is at once apparent that the sub-divisions of Myopia have by far the largest number, these having 22 (12 boys and 10 girls) out of the 33 cases.
In the Mixed Astig: group, only 8 cases (5 boys and 3 girls) were recorded.
In Hypermetropia only 2 cases.
In Hypermetropia $\overline{c}$ Myopia, 1 case.

This condition (Choroidal Changes) occurred more frequently at the ages of 10, 11, and 12 years.

Medulated Nerve Fibres, 3 cases.

Hyper: Astig: Comp:	1 girl	aged 8.
Myopia.	1 boy	" 11.
Myopic Astig: Comp:	1 boy	" 6.

Dark Fundi, 1 case, a boy aged 12, and came under the group Myopic Astig: $\overline{c}$ Mixed Astig:.

Alteration, or Disease of Optic Disc.

Congested Disc, 8 cases, (4 boys and 4 girls).

Hyper: Astig: Comp:	4 cases.	
	1 boy.	
	3 girls.	
Simple & Compound Hyper: Astig:	1 case.	
	1 boy.	
Myopic Astig: Comp:	3 cases.	
	2 boys.	
	1 girl.	

It was noted that 4 out of the 8 cases occurred at 7 years old; 5 out of the 8 cases were Hypermetropes, only 3 being Myopes.

Cupping of Discs, 2 cases, both boys.

In Hyper: Astig: Comp: group, 1 aged 7.
In Comp: Hyper: Astig:
c Mixed Astig: " 1 " 8.

Black Ring at Disc, 1 boy aged 9, in Hyper: Astig: Compound sub-group.

Outline of Optic Disc Indistinct, 2 cases, boys aged 8 and 10 years, both in the Hyper: $\overline{c}$ Hyper: Astig: sub-group.

Curved Edge of Disc. 1 boy aged 9, in the Hyper: Astig: Compound sub-group.

Grey Optic Disc. 1 girl aged 13.

Optic Atrophy.

"Optic Atrophy may be primary, that is to say it may originate in the nerve itself, or it may be secondary to changes which have occurred either in the retina or in the central nervous system. The Atrophy may follow inflammation; it is then usually termed post-neuritic or post-papillitic atrophy, or it may be simply due to degenerative processes of different natures." (Nettleship. Page 358).

In Optic Atrophy 6 cases were noted, (4 boys and 2 girls), and were distributed as follows:-

Hypermetropia 2 cases
1 boy aged 13
1 girl " 7

Hyper: Astig: Comp: 1 case.
1 boy aged 9.

Myopic Astig: Simplex. 1 case.
1 boy aged 6.

Myopic Astig: Compound. 1 case.
1 boy aged 9.

Mixed Astig: 1 case.
1 girl aged 8.

In these cases nothing except the fact that there was Optic Atrophy, was recorded, and the treatment consisted in Pot: Iodidi c̄ Liq: Hyd: Perchlor:, and one case had Liq: Strychnine for a period.

Albino. 1 boy aged 7 in the Mixed Astig: group.

The only remark made in this case was that the pigment was absent from the Choroid.

Amblyopia.

"The term Amblyopia is usually employed to signify defective vision due to disease or functional disturbance of retina, optic nerve, or visual centres, but with healthy ophthalmoscopic appearances, or with signs only of Optic Atrophy".

The term as it is here applied is used in those cases where the functions of the eye are in abeyance. Amblyopia occurs in squinting eyes etc.

The cases recorded number 29, (14 boys & 15 girls).

Amblyopia Left eye, 15 cases (7 boys & 8 girls) as follows:-

Hypermetropia 8 cases.
4 boys.
4 girls.

Hyper: Astig: Comp: 5 cases.
1 boy.
4 girls.

Hyper: c̄ Hyper: Astig: 2 cases.
2 boys.

Amblyopia Right Eye. 14 cases (6 boys & 8 girls) distributed as follows:-

Hypermetropia	5 cases. 2 boys. 3 girls.
Hyper: Astig: Comp:	6 cases. 4 boys. 2 girls.
Hyper: $\overline{c}$ Hyper: Astig:	1 case. 1 girl.
Simple & Compound Hyper: Astig:	1 case. 1 girl.
Comp: $\underset{c}{\text{Hyper}}$: Astig: Mixed Astig:	1 case. 1 girl.

Nystagmus.

By Nystagmus is meant an involuntary oscillation of the eyeballs from side to side, or a rotatory movement, usually found with congenitally defecive vision, as in Albinos, Coloboma of Choroid etc.

This condition was noted in 2 cases of Hypermetropia, also 2 cases of Myopia, and 3 cases of Mixed Astigmatism.

STRABISMUS.

The question of Strabismus is one which cannot be disposed of in a few lines.

It is one which not only strikes the general public more forcibly than any other trouble, but in point of fact, in a great number of cases it is because of this condition that the child's eyesight is brought under the notice of the parent, and then, and only then, is the child taken to the Ophthalmologist for treatment.

Many parents strongly object to glasses for their children, although they are fully aware that the child does not possess normal vision.

They will not take any measures to relieve the strain placed upon that organ, and so relieve the child of very many headaches, also punishments for inability to see at school; to say nothing of the child being prevented from competing on the same footing with other children who do possess normal eyesight.

As soon as the child begins to squint, then, and then only, do they think that treatment is necessary; and in very many cases, after consulting the Ophthalmologist, and glasses have been recommended, a fair percentage never adopt the treatment that is suggested.

{For Strabismus see appendix 6.
{Also appendix 7. Tables 10 to 17.}

From the cases here recorded I hope to deduct some very valuable information.

Before describing the cases of Strabismus, I will give a brief outline of this important subject, which I have obtained from reference to Berry's "Diseases of the Eye", Nettleship's "Diseases of the Eye" etc, etc.

By Strabismus or Squint is meant a defect in the movements of the eyes, by which, whilst one eye directs its visual axis towards the point fixed, the visual axis of the other eye is directed somewhere else. The first eye is called the fixing eye, the second, the deviating eye.

By Fixation point is meant, when both eyes are turned so that the fovea centralis of the retina receives the light from an object, so that the most sensative part of the retina, which is the fovea, receives the impression of that object. Should one eye be fixed on a certain point and the other turned elsewhere, the image of the point fixed falls on the fovea of the fixing eye; but of the deviating eye the image falls on some other part of the retina.

From this state we may get binocular diplopia, and to test which is the true image (i,e, the image in the fixing eye), and which is the false image (the image in the deviating eye), Maddocks test is used. This consists of 4 or 5 red glass rods being placed in front of either eye and noticing which is the proper image. The false image appears to be displaced in the direction opposite to that in which

the deviating eye is turned.

The presence of squint is usually quite obvious, but sometimes it is difficult to detect, for in some cases a child may appear to squint, yet on examination it is found that the visual axis is normal. On the other hand, the child may squint when the eyes are apparently straight.

One of the easiest and best methods employed to detect Strabismus when there appears to be any doubt, is to get the child to fix its gaze upon a certain point, then cover the fixing eye, and immediately the position of the eyes will change, so that the other eye can fix on the object, the covered eye deviates.

Principal forms of Squints. Concomitant and Paralytic.

Concomitant Squint.

This condition is where the visual axes do not intersect at the object looked at. There is practically no limitation of movement.
The Concomitant variety may be of two kinds:-

(a) Convergent Squint
(b) Divergent Squint.

Convergent Squint.

This is where the visual axes cross each other nearer to the eyes than the "fixed point". This gives rise to Diplopia,- the image of the right eye is seen to the right, and that of the left is seen to the left,- spoken of as Homonymous Diplopia, and said to occur mostly in Hypermetropia, due to the

great amount of accommodation necessary; accommodation and convergence being actions closely associated.

Divergent Squint.

Here we find that the visual axes cross each other beyond the "fixed point" (Relative Squint), or we may find that they actually diverge (Absolute Squint), and so do not intersect at all. In this condition we get a crossed diplopia. Divergent Squint is said to be frequently due to Myopia.

Monolateral, or Monocular Squint.

One eye having better acuteness of vision (although both eyes being abnormal), the better eye is fixed upon the object, whilst the other eye deviates from the fixation point, so a squint is produced. If the better vision eye is covered so as to prevent its use, the worse eye is immediately fixed on the object, whilst the other eye is seen to deviate, but when uncovered it immediately fixes again.

Alternating Squint.

This form is when for part of the time one eye is on the fixation point, whilst for the other part, this eye is the deviating eye etc.

Intermittent, or Periodic Squint.

This is where for a certain part of the time the movements of the eyes are quite normal, and the squint is only present for a brief period.

The opposite of Periodic Squint is Constant Squint. Constant squint is when the visual axes are never in normal relations.

The number of cases in which this complication was noted was 162, consisting of:-

Convergent Concomitant Strabismus	65	cases.
Left Internal or Convergent Strabismus	52	"
Right Internal or Convergent Strabismus	34	"
Divergent Strabismus	5	"
Left Divergent Strabismus	2	"
Right Divergent Strabismus	4	"
Total.	162.	

From the above list it will be at once seen that Strabismus is a very important factor in the eyesight of our school children; and that Convergent Squints are by far and away the most common.

These figures point out the fact that Convergent Concomitant Strabismus is the commonest variety, a fact which upon looking up the subject most authorities seem to be agreed. The Left Convergent Strabismus comes next; whilst the Right Convergent Strabismus is not nearly so common. Of the Divergent variety there appears to be very few, 11 cases only recorded out of the 162.

Concomitant Convergent Strabismus.

This group as has been stated contributes 65 cases (33 boys and 32 girls) and occur in the following sub-groups:-

Hypermetropia (Pure & Simple)	15 cases. 4 boys. 11 girls.
Hyper: Astig: Simplex	1 case. 1 boy.
Hyper: Astig: Comp:	32 cases. 16 boys. 16 girls.
Hypermetropia c Hyper: Astig: Comp:	13 cases. 9 boys. 4 girls.
Myopic Astig: Comp:	1 case. 1 girl.
Comp: Hyper: Astig: c Mixed Astig:	1 case. 1 boy.
Myopic Astig: c Mixed Astig.	1 case. 1 girl.
Hypermetropia c Myopia.	1 case. 1 boy.

From the above list it is obvious that all the sub-divisions of Hypermetropia contribute a large number of cases; Compound Hyper: Astig: having practically half the cases; whilst Hypermetropia pure and simple contributes roughly one fourth. Hypermetropia in one eye, with Hyper: Astig: Comp: in the other eye giving a little under one fourth of the cases. Of the remaining 5 cases, only 1 being found in the Myopic group pure and simple; 2 being in the Mixed Astig: group, 1 with Hypermetropia in one eye and Myopia in the other, and 1 being in the Hyper: Astig: Simplex group.

In regard to the age of the patients at the time they came under observation there is nothing special of note, excepting that it emphasizes the fact that although very many of them had squinted since they were a few years old, the parents had not taken any trouble to have them attended to.
The following came under observation:-

At	5	years old	12 cases.
	6	" "	5 "
	7	" "	12 "
	8	" "	5 "
	9	" "	6 "
	10	" "	11 "
	11	" "	12 "
	12	" "	2 "
	13	" "	1 "
		Total.	65

Treatment of Convergent Concomitant Strabismus.

(see appendix 7. Tables 11 + 16)

Of the 65 cases of this group, 53 (29 boys and 24 girls) had the retinoscopy taken under either Homatropine or Atropine, also had glasses given which fully corrected the defect. In order to overcome the spasm of the Ciliary muscle, a weak solution of Atropine was given, which in very many cases was continued for several weeks, with the result that at the last visit, the patient was reported to be doing "nicely" and that the eyes were perfectly straight. After this happy state of affairs had been arrived at, in some few cases the parents stopped the child from wearing glasses, with the result that the squint returned.

In 5 cases of the 65 (1 boy and 4 girls) it was necessary to do a Double Tenotomy, that is to say, it was necessary to cut through (under an anaesthetic) the Internal Rectus of both eyes. After this proceeding the eye was fairly straight, but it was necessary to give glasses which fully corrected the defect, and also to use Atropine in one form or another for some time, with the result that the child's eyes were kept straight.

The remaining 7 cases after having had their eyes tested, Retinoscopy taken, did not appear again at the Hospital, being afraid of the "drops".

Left Convergent Strabismus.

(Left Internal Strabismus).

This group contributes 52 cases (27 boys & 25 girls). They occur in the following sub-groups:-

Hypermetropia	18 cases. 12 boys. 6 girls.
Hyper: Astig: Simplex	1 case. 1 boy.
Hyper: Astig: Comp:	22 cases. 9 boys. 13 girls.
Hypermetropia c Hyper: Astig:	9 cases. 4 boys. 5 girls.
Comp: Hyper: Astig: c Mixed Astig:	1 case. 1 girl.
Hypermetropia c Retinoscopy Impossible.	1 case. 1 girl.

Here again we notice the fact that practically all the cases come under the Hypermetropic group, in fact there is only 1 case which does not, and it is that of a girl who had Mixed Astigmatism in one eye, and Comp: Hyper: Astig: in the other eye.

Here as in the former group (Concomitant variety) we find that Hyper: Astig: Compound contributes the largest number of cases to Strabismus. Those of Hypermetropia Simplex come next, and then those of Hypermetropia $\overline{c}$ Hyper: Astig: Compound. Hyper: Astig: Simplex contributing only 1 case.

In regard to the ages the remarks in the former group equally apply.

The following came under observation:-

At	5	years old	13 cases.
	6	" "	7 "
	7	" "	6 "
	8	" "	7 "
	9	" "	4 "
	10	" "	6 "
	11	" "	3 "
	12	" "	4 "
	13	" "	2 "
		Total.	52.

Treatment of Left Convergent Strabismus.

(See appendix 7. Tables 14 + 16.)

Of the 52 cases which came under treatment 35 (18 boys and 17 girls) after having had their eyes properly examined, were given glasses which fully corrected the defect, also a weak solution of Atropine, with the result that in the majority of cases the eyes became practically straight, and remained so as long as glasses were continued.

On the other hand there were 12 cases which were either so bad, or they did not get any beneficial result from the treatment and so were advised to have Tenotomy of the Left Internal Rectus, which they submitted to under an anaesthetic. After this proceedure they were again given glasses to correct the defect, also a solution of Atropine, with the result that their eyes kept practically straight. There were 5 cases after having had their eyes examined, did not return to the Hospital for treatment.

Right Convergent Strabismus.

This group contributes 34 cases (18 boys & 16 girls) and they accur in the following sub-groups:-

Hypermetropia Simplex	7 cases.	
	6 boys.	
	1 girl.	
Hyper: Astig: Comp:	19 cases.	
	10 boys.	
	9 girls.	
Hypermetropia c Hyper: Astig:	5 cases.	
	2 boys.	
	3 girls.	
Myopic Astig: Comp:	1 case.	
	1 girl.	
Mixed Astigmatism.	1 case.	
	1 girls	
Simple & Compound Hyper: Astig:	1 case.	
	1 girl.	

Again we notice that as in the two former groups the greater proportion occur first in Hyper: Astig:, next in Hypermetropia, and thirdly in Hyper: c Hyper: Astig:. Then we have one girl in the Myopic group, and one girl in the Mixed Astig: group.

The following table gives the ages at the time they came under observation:-

At	5	years old	5 cases.
	6	" "	5 "
	7	" "	3 "
	8	" "	3 "
	9	" "	1 "
	10	" "	6 "
	11	" "	4 "
	12	" "	4 "
	13	" "	3 "
		Total.	34.

Treatment of Right Convergent Strabismus.

(See appendix 7. Tables. 15 + 17.)

Of the 34 cases 21 (12 boys and 9 girls) after examination under Atropine as in the former group, were also given glasses which fully corrected the error of refraction and with similar results; whilst in 6 cases (2 boys and 4 girls) it was found necessary to do Tenotomy of the Right Int: Rectus, followed by Atropine and glasses, which fully corrected the error. The remaining 7 cases after examination, did not return for treatment.

Divergent Strabismus.

This group is divided into:-

(1) Divergent Strabismus, and consists of 5 cases (1 boy and 4 girls) and were in the following sub-groups:-

Hyper: Astig: Comp: 3 cases.
1 boy.
2 girls.

Hypermetropia
c
Hyper: Astig: 2 cases.
2 girls.

(2) Left Divergent Strabismus, and consists of 2 cases both girls.

Hyper: Astig: Comp:	1 case. 1 girl.
Myopic Astig: Comp:	1 case. 1 girl.

(3) Right Divergent Strabismus, 4 cases, all girls.

Myopia Simplex	2 cases. 2 girls.
Myopic Astig: Comp:	1 case. 1 girl.
Mixed Astig:	1 case. 1 girl.

Those cases which are labelled "Divergent Strabismus" are the most numerous.
There are more cases of Right Divergent Strabismus than Left.
Of the whole, 6 cases out of the 11 belong to the Hypermetropic group, 4 belong to the Myopic, and 1 to the Mixed Astig: group.

The above cases are certainly contrary to what is generally expected. Most authorities point out the fact that Divergent Strabismus generally occurs in the Myopic group.

The treatment simply consisted in giving concave glasses to be worn constantly, in some of the cases Atropine was ordered for a brief period.
In no case was Tenotomy performed.

One case, a boy aged 6, and simply recorded as having "Squinted since Birth" belonged to the Myopic Astig: Simplex group.

The ages at which the various cases came under observation are as follows:-

Divergent Strabismus.

At	5	years old	1 case.
	6	" "	2 cases.
	7	" "	1 case.
	11	" "	1 "

Left Divergent Strabismus.

At	9	years old	2 cases.

Right Divergent Strabismus.

At	9	years old	1 case.
	10	" "	1 "
	11	" "	1 "
	12	" "	1 "

Remarks upon Strabismus.

From the above analysis it is quite obvious that the greater proportion of the cases of Convergent Strabismus are in the Hypermetropic group.
Of the Divergent Strabismus, about one half belong to the Hypermetropic group, the other half to the Myopic group.

In several cases of either Left or Right Convergent Strabismus, operative interference had been recommended, but this having been refused by the parent, the child simply continued with the glasses and returned in some months time, with the eyes practically straight.

I think it is a very good plan even in some of the most persistent cases, to give time for the correcting glasses to relieve the condition.

Another point noted was that not in any case was there necessity for advancement of the other Rectus muscle, - Tenotomy being quite sufficient to obtain a good result.

Pain in the Head.

This condition I am afraid has not been fully reported upon, yet these cases will serve the purpose of drawing attention to "Pain in the Head".

There were 32 cases recorded (10 boys and 22 girls) which I believe were directly traceable to the errors of refraction, and were noticed in the following sub-groups:-

Hypermetropia	10 cases.	
	3 boys.	
	7 girls.	
Hyper: Astig: Simplex	2 cases.	
	1 boy.	
	1 girl.	
Hyper: Astig: Comp:	9 cases.	
	2 boys.	
	7 girls.	
Hypermetropia c Hyper: Astig:	9 cases.	
	3 boys.	
	6 girls.	
Myopic Astig:	1 case.	
	1 girl.	
Simple Hyper:Astig: c Mixed Astig:	1 case.	
	1 boy.	

It is again seen that the Hypermetropes are the greatest sufferers, having 30 of the cases.

By giving the correcting glasses, the pain was either relieved or disappeared.

Pain in the Eyes.

Only 8 cases are recorded (2 boys & 6 girls).

Hypermetropia (Pure and Simple)	5 cases. 1 boy. 4 girls.
Hyper: Astig: Comp:	2 cases. 1 boy. 1 girl.
Hypermetropia c Hyper: Astig:	1 case. 1 girl.

It is at once seen that all the cases recorded belong to the group Hypermetropia.

Photophobia.

One case, a girl aged 10 who had Photophobia, yet no inflammation was noted. This came in the Hyper: Astig: Compound group.

Vertigo.

This patient complained of dizziness . A boy aged 11, and had Hypermetropia in one eye and Hyper: Astig: in the other eye.

Mentally Deficient, due to Injury.

This patient, a boy aged 11, had suffered from an accident and in consequence was mentally deficient. This case belonged to the Hyper: Astig: Compound group.

Dermoid. This was at the upper angle of left eye and was noted in a girl aged 10.

Meibomian Cysts.

One case, a boy aged 7, in the Hypermetropic group. This condition is also spoken of as Chalazion, and is due to granulation tissue and retained secretion in a Meibomian gland.

Extraction for High Myopia.

Case of a girl aged 10, who had Compound Myopic Astigmatism, and over — 10D degrees of Myopia. Both lenses were removed by Linear Extraction. Visual acuity on the first visit was $\frac{6}{60}$ and was not much improved, but on the last visit the visual acuity was $\frac{6}{24}$.

"Bad Stomach".

One case, a boy 9 years. He complained of having a "bad stomach", and was found to have Mixed Astigmatism.

S E C T I O N 7 .

CASES OF GROUP 3, IN WHICH ATROPINE WAS USED, BUT NO RETINOSCOPY DONE.

PAGES 112 to 115.

CASES IN WHICH ATROPINE WAS USED BUT NO RETINOSCOPY DONE.

There were 11 cases (6 boys & 5 girls).

Ulcer of Cornea. One case, a boy aged 6. Retinoscopy was impossible.

Congenital Cataract with extraction of both lenses. There were 3 cases,- 1 boy 6 years, 1 girl 7 years, and 1 boy 7 years.

The different forms of Cataract which occur in juveniles are:-

(1) Complete, in which all the lens is opaque.

(2) Lamellar or Zonular, in which around a clear Nucleus is found a layer of opacity, surrounded again by a transparent lens substance.

(3) Posterior Polar, in which there is a sharply limited opacity at the posterior pole of the lens.

(4) Central or Congenital nuclear, in which the centre of the lens is opaque.

The above 3 cases belong to the Lamellar or Zonular variety. First a Discission was done, and then in about a weeks time, a linear extraction, with eventually good results.

Keratitis & Choroiditis Pigmentosa & Nystagmus.

Only one case. This was a girl aged 10, and it was noticed that she had Rhinitis, Adenoids, and also "Hutchinsons teeth". This case was Syphilitic in origin (Congenital) and was treated with Pot.Iodidi

and Liq. Hyd. Perchlor.

Conjunctivitis of Socket. One girl aged 8, following enucleation for Glioma 6 years previously.

Glioma. This condition is described as a malignant new growth occurring congenitally, or in young children.

It starts in the retina and fills the vitreous chamber with a mass that gives, through the pupil, a brilliant yellow-whitish appearance, with fine blood vessels upon it. It then pushes forward the lens, causes increased tension of the globe with external redness, and eventually causes death by extending to the brain.

I will here give (what I think will be of interest) a history of the case given above under the heading of Conjunctivitis of Socket.

This case is one in which Glioma was first noticed at the age of 2 years. At 1 year old, this child had measles, although before this her eyes looked "queer". Upon examination, it was noticed that there was a white membranous looking surface with fine vessels clearly ramefying on it, seen on looking into the eye through the pupil, but deeply situated. Outward squint, tension increased, and by oblique illumination seen to be deeply cleft, surface not smooth but rather flocculent.

The eye was enucleated under an Anaesthetic, and upon making a section of the nerve it was found to be infiltrated with the growth.

Optic Neuritis due to Cerebral Tumour.

2 cases,- 1 boy aged 6, and 1 boy aged 11.

In the case of the boy aged 6, it was noted that he vomited, had headache and fits, and was unconscious for 4 days, and also unable to walk. The fits started in the right hand. No albumen, no sugar in urine.

In the case of the boy aged 11, it was noticed that he had Paresis of left arm and left leg, was unable to turn himself in bed, knee jerks increased, constant vomiting, much headache, periods of unconsciousness, no discharge from ears, and no albumen or sugar in urine.

Upon examination of the fundus in each case it was noticed that the Papillae of both eyes were very much swollen and the arteries small.

Optic Neuritis is described as a "plastic inflammation of the ocular extremity of the optic nerve". Probably in the great majority of cases the nerve and its lymph channels are affected throughout its whole length. It is sometimes called Papillitis.

Ophthalmoscopic appearances. The small vessels are dilated, and so a reddish hue is given to the disc. The retinal arteries are diminished in size, the veins are swollen and tortuous, and the outline of the disc is hidden by the œdematous swelling. Often the neighbouring fundus presents small haemorrhages.

Hydrocephalus Secondary to Basic (post.) Meningitis.

This was a case of a girl aged 6 who came with the history that she had had Pertussis 3 months previously. There was vomiting and pain in the head located to the right frontal region. The headache lasted 2 weeks and following this her eyesight became worse. Her right eye had been more prominent than the left since 18 months old. At that age she had "croup", which left a weakness in the left hand and slightly in the left leg, knee jerks absent and no ataxia.

Upon examination it was found that both discs were very pale, with distinct clear cut margins, and vessels thin. No signs of old Neuritis; muscles of eyes all weak but apparently the Ext. Recti most.

Atropine in one Eye.

Two cases, 1 girl aged 9, and 1 boy aged 9. The mother had dropped some Liq. Atrop. in each case, by mistake for other children who were attending the Hospital.

S E C T I O N 8.

SUMMARY AND CONCLUSIONS OF THE 1041 CASES.

PAGES 116 to 133.

SUMMARY AND CONCLUSIONS.

In giving a summary of the results obtained by the analysis of the cases which I have recorded, I am fully aware that my conclusions might have been more complete, but as it is I contend that my results are important, and certainly give a vast amount of valuable information to the Educational Authorities.

Had my conclusions been based upon the results obtained by an examination at the different schools, the question of locality of the schools etc, class of children, standards, the proportion of Ametropic and diseased eyes to the normal, could have been reported upon.

GROUP 1.

The cases which came for some diseased or inflammatory condition of the eye, numbering 305. The following notes are interesting:-

(a) The Cornea was the part of the eye which was the most commonly affected, and this was chiefly found in the unkempt and dirty children.

Phlyctenular Keratitis being the most common disease, and girls were affected more than boys.

(b) In the cases of Corneal affections, if the treatment was persisted in, the patients eventually obtained good results, but the condition was prone to return.

These cases caused more trouble to the Hospital Staff than any other.

(c) In those cases which were affected by Conjunctivitis, the proportion of boys to girls was about equal.

Certainly a fair number of these were infective, several members of the same family attending for this condition at the same time; whilst a few cases occurred after Measles, Scarlet Fever, and in one case (in which the pus was examined microscopically) the pneumo-coccus baccili was found.

(d) With regard to the ages at which the patients in this group came for treatment (see appendix 1. Page 1 and 2) I find that the cases were distributed fairly evenly at the different ages.

I feel certain that if these cases had been examined by retinoscopy it would have shown that very many of them had some error of refraction, and if this had been corrected, the strain would have been relieved, thereby cutting short the disease, and preventing several of the relapses.

GROUP 2.

Here we have 725 children, who were all examined under Homatropine, or Atropine, and their retinoscopy taken.

The following points are interesting:-

Firstly in Hypermetropia.

(a) That the largest proportion of the cases were Hypermetropic, viz, 73.378% of the 725.

(b) That there were a larger proportion of girls than boys, viz, 40.965% girls, 32.413% boys.

(See appendix 2. Page 1, for sections a & b).

(c) That the proportion of Hypermetropia Simplex, to Hyper: Astigmatism, was:-

Hypermetropia Simplex	30.263%
Hypermetropic Astigmatism	60.737%.

Thus Hypermetropia Simplex forms only one third of the cases of Hypermetropia.

(d) That Compound Hypermetropic Astigmatism was the most common form of Hypermetropia, (49.436% of its group).

(e) That the majority of cases of Hypermetropia came under observation at the ages of 7 and 8 years, up to 11 years.

(See appendix 3. Page 1, for sections c, d, e).

(f) In reference to the degree of Hypermetropia I am fully convinced that this does diminish with the age of the child, and the cases which are recorded simply point out the fact that it is only on perceiving that the child's eyes become tired due to strain of school work, that it is brought for treatment, to the Hospital,

and not until then is the error detected.

I consider that Hypermetropia is undoubtedly the normal condition in childhood, and in very many cases it is only brought to notice by the stress of school work.

That the majority of these cases have + 3D degrees (or under) of Hypermetropia. This applies to all the sub-groups.

Between + 3D degrees and + 6D degrees, we have roughly just one half of those cases which are "up to + 3D".

Cases over + 6D degrees constituted about one fourth of all the cases of Hypermetropia. (See appendix for degrees

(g) In the group Hypermetropia $\bar{c}$ Hyper: Astigmatism Compound it was noticed that most of the casss had Hypermetropia Simplex in the left eye; the right eye having Hypermetropic Astigmatism Compound.

(h) That Hypermetropes suffered greatly from inflammatory conditions of the Cornea, Conjunctiva etc, (See summary of complications in appendix

Secondly in Myopia.

(a) That in Myopia undoubtedly we find a fairly large proportion of cases considering the fact that Hypermetropia is the normal condition of the eye in childhood, viz, 12.826% of the 725.

(b) The proportion of boys to girls is about equal, viz, 6.068% boys,
6.758% girls.

(See appendix 2. Page 2, for sections a & b).

(c) The proportion of Myopia to Myopic Astigmatism was:-

Myopia 27.956%
Myopic Astig: 72.044%.

(d) That Compound Myopic Astigmatism was the largest sub-group, 40.860%.

(e) That the cases of Myopia came under observation mostly after the age of 8.

(See appendix 3. Page 2, for sections c, d, e).

(f) In reference to the degree of Myopia, roughly one half of the cases were under —3D degrees, the remainder being over —3D degrees.

Undoubtedly this is progressive in very many cases, a fact which is fully borne out by the re-examination of some of the children.

(For degrees, see appendix

(g) That Myopia is associated with a diseased condition of the eye, Choroidal Changes etc, etc. (See summary of complications in appendix)

Thirdly in Mixed Astigmatism.

(a) That Mixed Astigmatism is far more common than many authorities would have us believe.

In this group 90 cases were found in the 725, viz, 12.413%.

(b) That girls were more affected than boys:-

4.827% boys,
7.586% girls.

(See appendix 2. Page 3, for a and b).

(c) The proportion of Mixed Astigmatism in both eyes to all other forms, i.e. where there is Mixed Astigmatism in one eye, and either Hypermetropia or Myopia in the other eye, was:-

Mixed Astigmatism (both eyes) 56.6%

Mixed Astigmatism in one eye
c
either Hypermetropia or Myopia
in the other eye, 43.4%.

(See appendix 3. Page 3).

(d) That in the cases in which Mixed Astigmatism occurred in one eye, and Hypermetropia in one form or another in the other eye, the greatest proportion occurred in children between the ages of 6 and 11 years; whilst in those cases in which Mixed Astigmatism occurred in one eye, and Myopia in one form or another in the other eye, there was only one case which occurred before 9 years old. The majority occurring between the ages of 9 and 12 years.

Table giving Ages.

Ages:-	6	7	8	9	10	11	12	13	Total.
Mixed Astig: (both eyes)	3	6	6	13	9	6	7	1	51
Hypermetropia c Mixed Astig:	2	2	3	3	5	6	1	3	25
Myopia c Mixed Astig:		1		3	4	1	4	1	14

(e) That Mixed Astigmatism is the bridge over which Hypermetropia passes into Myopia. See "Interesting Cases".

(f) That the Myopic meridian is usually vertical, and the Hypermetropic meridian horizontal. Only 9 cases of the 90 having the Myopic meridian horizontal.

Fourthly in Hypermetropia $\overline{c}$ Myopia.

Hypermetropia in one eye, and Myopia in the other eye. There were only 5 cases; although so few they will serve to emphasize the necessity of having both eyes examined separately.

Fifthly in Normal Refraction, or Emmetropia.

In this group there were 4 cases suffering from Spasm of Accommodation. These point out the necessity of not over taxing the children in their work.

Observations upon the Complications of the Different Groups.

(See appendix for complete list).

(a) That inflammation of the eyelids, Conjunctiva, Cornea etc, is far more common in cases of Hypermetropia. There were a few in Myopia, also a few in Mixed Astigmatism and these were mostly in the sub-groups where Mixed Astigmatism

was in one eye, with Hypermetropia in the other eye.

It is suggested that these inflammatory conditions are due to the child inoculating his eyes by constant rubbing on account of the eyes feeling tired, due to the strain upon the accommodation.

Girls were greater sufferers than boys.

(b) Changes in the Choroid etc. Myopes were most frequently affected by this, having 22 cases. Mixed Astigmatism came next, having 8 cases. Hypermetropia only one case. Hypermetropia $\overline{c}$ Myopia only one case.

The above cases point out that the changes in the Choroid were mainly in Myopia, thus bearing out previously recorded facts.

It is also interesting to note that there were a large number in the Mixed Astig: group.

(c) Congested Discs, mainly in Hypermetropia, although 3 cases out of the 8 recorded were in the Myopic group.

(d) Amblyopia was fairly common.

(e) Strabismus. In one form or another this was exceedingly common. The Convergent variety, numbering 151, were by far and away the most common.

In the sub-groups the cases of Concomitant Convergent Strabismus were most numerous, having 65. Those of the Left Convergent Strabismus came next, having 52.

Of the Right Convergent Strabismus there were not nearly so many, there being only 34. Most of the cases occurred in the Hypermetropic group, there were only 7 cases which did not do so, of these, 2 were in the Myopic group, 4 in the Mixed Astigmatism group, and one in the Hyper: $\overline{c}$ Myopia group.

Of the Divergent variety there were 11 cases, distributed as follows:-

6 were Hypermetropes,
4 " Myopes,
1 was Mixed Astig:.

This is certainly contrary to what generally occurs, they are mostly in the Myopic group.

(f) Pain in the Head, 32 cases. All the cases recorded under this heading, with the exception of 2, were Hypermetropes.

The exceptions were:-

One case in the Myopic Astig: Simplex sub-group.

One case in the Mixed Astig: $\overline{c}$ Hyper: Astig: Simplex sub-group.

This shows that any extra effort thrown upon the act of accommodation, undoubtedly causes headache.

Observations upon the General Outline of the Different Groups, with Conclusions.

(1st) With regard to the Hypermetropic eye becoming Myopic, I fail to find sufficient evidence as to whether the cause is due to the strain pure and simple, or to a diseased condition of the Choroid etc. Personally I think it is due to a combination of both of these conditions, although the strain certainly plays a very important part.

(2nd) In comparing the different groups it is a noticeable fact that girls are greater sufferers than boys, and I would emphasize the fact that it is in children between the ages of 7 and 11 years that the strain upon the eyesight appears to be the greatest.

(3rd) The absolute necessity for school children having both eyes examined separately for visual acuity upon admission to the school.

I have tabulated a series of cases (see appendix) showing that undoubtedly children may have fairly good, or very good vision in one eye, whilst the vision of the other eye is moderate, or even bad.

Several of these cases which have been tabulated were not sent by the school authorities but brought by the parent, these children

having passed the tests employed.

It certainly appears to me to be a distinct advantage for children to have the combined use of both eyes. If they are allowed to go on using one eye only, the other eye eventually becomes Amblyopic, thus they are handicapped during their school life, and also in after life.

(4th) Spasm of Accommodation is a condition which is frequently met with in our children, and it is on this account that I strongly condemn the practice which is very much in vogue, of parents, and even school authorities sending children to so-called "Opticians"; for it is impossible for anyone to fully estimate the degree of error of refraction in any child unless its "accommodation" is properly paralysed; a fact which has been well illustrated in numerous instances in my paper.

In many of the children who had Homatropine dropped into their eyes, their retinoscopy taken, yet obtained no improvement with glasses, I find that when Atropine was given for a week, and retinoscopy again taken, there was found to be a great difference between the first and second examination, showing the fact that "Spasm of "Accommodation" may lead one into error.

Although the visual acuity may be bad in some cases, upon examination by retinoscopy the eye is proved to be Emmetropic.

Of the 110 cases of Spasm of Accommodation,

91 were Hypermetropes,
12 " Myopes,
3 " Mixed Astig:
1 was Hyper: c Myopia,
4 were Normal.

This shows that the condition occurs most frequently in Hypermetropes.

(5th) From the complications which occurred in the various groups I think we can safely deduct that it is absolutely necessary to have the eyes of every child examined as soon as there is any inflammatory condition of the mechanism of the eye; for although the defect in refraction may not be the actual cause, yet, it does aggravate the trouble, and if the proper correcting glasses are given, this prevents a recurrence.

It is suggested that very many of these complications are produced and aggravated by the child rubbing its tired eye.

Here again I consider we have a very strong argument against unqualified men being partially trained as so-called "Opticians" when they would be quite unable to diagnose any of these diseased conditions.

(6th) Children should not be admitted to any school before the age of six, and even at that age the work should be light.

It should be forcibly impressed upon parents that schools are not nurseries. The early training of all children should be in the hands of the mothers, and they alone are responsible for the care and training of their children.

It would certainly be interesting to compare the eyesight of children who have attended school from the age of three and upwards with those who have not been sent to school before the age of five or six years.

I consider that a wise course has been adopted by the authorities during the past twelve months in stopping the grant for children under five years of age.

(7th) I am convinced that the authorities are taking precautions in all directions save that of compelling parents to have the eyes of their children properly examined by an Ophthalmologist.

What might be done with advantage would be to point out to the parents by a "printed letter" the absolute necessity of their children having the full and combined use of both eyes, and the folly of not allowing them to wear glasses simply for the sake of appearance; and also to point out that from the disuse of one eye, the child may eventually lose the sight of this eye, and thus be

considerably handicapped in his after life.

I am fully aware of the fact that no action could be taken if the parent refused to have his child attended to, yet I feel certain that if compulsory education is enforced, then it is not sufficient for the authorities to simply give one, two, or three notices, and then take no further action, but they must, in the interest of the child, and thus of the community, refuse to allow children to take advantage of free education; for undoubtedly drastic measures are necessary, otherwise, through lack of thought, or through ignorance, our children may become useless citizens.

Another alternative is to provide a properly trained Ophthalmologist and have children attending all schools thoroughly examined, ignoring the parent. Upon this point I will make some observations later.

(8th) Home lessons, for children under nine or ten years old, should be strongly discouraged, and even at this age it should depend upon the child's capabilities as to the amount given.

(9th) It should be impressed upon the parent the importance of seeing that the child when doing home lessons, should be in a properly lighted room, and that the desk, form or chair, and paper, be in proper relationship.

(10th) Children who have defective eyesight or are otherwise weakly, should have a modified curriculum.

(11th) There should be a period of rest between all lessons, also constant change from reading or writing to black board, or object lessons etc.

(12th) Teachers should be instructed as to the elementary facts of the relationship of school work and strain to the eyesight. I find that upon this point very many teachers are extremely ignorant, and I would enforce a special class of instruction upon this subject.

(13th) That there is an advantage of having the eyesight of school children properly examined and their error of refraction corrected, I think no one will doubt, but I think the following tables which give the visual acuity of the right and left eye of 683 cases upon their first visit, and the visual acuity of 407 of these cases upon their last visit to the Hospital, will give an indication of the advantages which are obtained by treatment.

TABLE A.

The Visual Acuity Recorded of 683 Cases upon their First Visit.

	6/5	6/6	6/9	6/12	6/18	6/24	6/36	6/60	6/0	Fingers	Board	Total.
Right.	31	55	74	100	144	106	91	57	16	7	2	683
%	4·538	8·052	10·834	14·494	21·834	15·519	13·323	8·345	2·342	1·024	·292	
Left	26	62	88	94	155	92	79	56	22	8	1	683
%	3·806	9·077	12·884	13·762	22·693	13·469	10.102	8·169	3·221	1·200	·146	

TABLE B.

The Visual Acuity Recorded of 407 Cases upon their Last Visit.

	6/5	6/6	6/9	6/12	6/18	6/24	6/36	6/60	6/0	Fingers	Total.
Right	42	69	130	95	45	13	7	3	2	1	407
%	10·319	16·953	31·938	23·341	11·056	3·194	1·719	·737	·491	·245	
Left	48	64	148	78	44	8	7	8	2		407
%	11·793	15·724	36·363	19·164	10·810	1·965	1·719	1·965	·491		

From the comparison of the above tables, it is quite clear that by the treatment the children have had marked improvement in their vision.

(14th) Upon the question of the various kinds of glasses prescribed, it is of interest to note that + Spherical lenses (convex lenses) outnumbered all the others, in fact nearly Half the number prescribed were of this kind, (the number being 289 out of the 627). See appendix 10 for glasses, this gives kind, price, etc.

(15th) If the children are to be examined by a competent Ophthalmologist it would certainly be to some extent a burden upon the rates, and I have tried to estimate roughly what it would cost in a town like Bradford.

The number of visits paid by the children to the Hospital as out-patients were 4317, whilst over and above this, one bed was occupied at the Hospital for a period corresponding to 74 weeks and 6 days.

The number of glasses which the children received amounted to 627 pairs.

	£	s	d.
Visits (4317) as out-patients at 2/6 per visit	539	12	6
Cost of glasses given (627 pairs)	128	2	0
Rough estimate for cost of bed (at 8/- per week per child) for 74 weeks 6 days	29	19	0
£	697	13	6.

The foregoing is roughly the cost of practically half the number of children who attended the Bradford Eye and Ear Hospital from April 1902 to November 1905.

As before stated the cost for the medical attendance upon half of the children attending the Hospital is £539.12.6, therefore for the whole number the cost will be roughly £1079.5.0.

If the authorities decided to provide medical officers as Ophthalmologists they would be able, by the levy of slightly under one farthing in the £ on the rates, to guarantee a salary of £550 per annum to two medical men, and on this basis their remuneration would be at the rate of 2/6 per consultation.

In Bradford, one penny in the £ produces £5000.

A P P E N D I X 1.

(GROUP 1)

CASES IN WHICH NO REFRACTIONS WERE TAKEN AND NO ATROPINE USED.

Number of Cases = 305.

CASES IN WHICH NO REFRACTIONS HAVE BEEN TAKEN AND NO ATROPINE OR HOMATROPINE.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Blepharitis	Boys.	3	1		2		4	1	3	1	15
	Girls.	4	3	1	1	2	6	1	3	1	21
	Total.	7	4	1	3	2	10	2	5	2	36
Conjunctivitis	Boys.				1			1	1		3
	Girls.	2			1						3
	Total.	2			2			1	1		6
Acute Conjunct:	Boys.	4	2	1	1	1	2	1			12
	Girls.		2	1		1	1	2	1	2	10
	Total.	4	4	2	1	2	3	3	1	2	22
Purulent Conjunctivitis	Boys.		1		1			1			3
	Girls.	2						2	1	1	6
	Total.	2	1		1			3	1	1	9
Siphilitic Conjunct: c Iritis.	Boys.					1					1
	Girls.										
	Total					1					1
Phlyct: Keratitis.	Boys	4	1	5		1	1	3	1	1	17
	Girls.	9	5	5	5	2	4	3	5	2	40
	Total.	13	6	10	5	3	5	6	6	3	57
Marginal Keratitis.	Boys.		4	2		1					7
	Girls.	4	5	2		1	1	1	2		16
	Total.	4	9	4		2	1	1	2		23
Xerosis Conjunct:	Boys.				1						1
	Girls.										
	Total.				1						1
Keratitis Interstitial.	Boys.	5	1	1	3		1	4	3	2	20
	Girls.	2	4	5	4	3	1	3	3		25
	Total.	7	5	6	7	3	2	7	6	2	45
Keratitis Syphilitic.	Boys.				1		1				2
	Girls.		1	1							2
	Total.		1	1	1		1				4
Maculae, Nabulae & Leucoma.	Boys.	2	2	1	1	1	1				8
	Girls.	1		2	2	1	2	1	1	1	11
	Total.	3	2	3	3	2	3	1	1	1	19
Ulcer of Cornea.	Boys.	2	4	1			4	3			14
	Girls.	8	5	3	4	6	4	1	1	2	34
	Total.	10	9	4	4	6	8	4	1	2	48
Abcess of Lid.	Boys.			1		1		1			3
	Girls.										
	Total.			1		1		1			3

CASES IN WHICH NO ATROPINE OR HOMEATROPINE USED AND NO REFRACTION TAKEN.

AGES:-		5	6	7	8	9	10	11	12	13	Total.
Abscess of Lid.	Boys.			1		1		1			3
	Girls.										
	Total.			1		1		1			3
Abscess of Lid Traumatic.	Boys.			1							1
	Girls.										
	Total.			1							1
Styes.	Boys.										
	Girls.	1									1
	Total.	1									1
Cysts.	Boys.										
	Girls.								1	1	2
	Total								1	1	2
Abscess of Lacrymal Sac.	Boys.		1			1					2
	Girls.										
	Total.		1			1					2
Eczema of Lid.	Boys.										
	Girls.		1		1						2
	Total.		1		1						2
Foreign Body in Eye.	Boys.					1					1
	Girls.										
	Total					1					1
Traumatic Haemorrhage Conjunct:	Boys.					1		1	1	1	4
	Girls.										
	Total.					1		1	1	1	4
Traumatic Haemorrhage in to Ant: Chamber	Boys.										
	Girls.					1					1
	Total.					1					1
Enucleation for Traumatism.	Boys.	1									1
	Girls.										
	Total.	1									1
Pain in eyes did not come again.	Boys.										
	Girls.						1				1
	Total.						1				1
Paresis of 3rd nerve.	Boys.										
	Girls.	1									1
	Total.	1									1
Congenital Dislocation of Both Lenses.	Boys.		1				1				2
	Girls.										
	Total.		1				1				2

CASES IN WHICH NO ATROPINE OR HOMEATROPINE USED AND NO REFRACTION TAKEN.

AGES:-		5	6	7	8	9	10	11	12	13	Total.
	Boys.										
Aphakia.	Girls.					1					1
	Total.										
Detached Iris & Opaque Lens	Boys.										
Traumatic.	Girls.			1							1
	Total.			1							1
Left Int:	Boys.	1		1							2
Strabismus.	Girls.										
	Total	1		1							2
Right Int:	Boys.					1					1
Strabismus.	Girls.				1						1
	Total.				1	1					2
Conv: Conc:	Boys.	1									1
Strabismus	Girls.	1	1	1	2						5
	Total.	2	1	1	2						6
Pain in Head following	Boys.							1			1
Meningitis.	Girls.										
	Total.							1			1

Total. 305.

A P P E N D I X 2.

(GROUP 2)

CASES IN WHICH ATROPINE, OR HOMATROPINE WAS USED, AND REFRACTIONS TAKEN.

Worked out to the Percentage of the 725 Cases Comprising this Group.

HYPERMETROPIA.

YRS:-		5	6	7	8	9	10	11	12	13	Total	%
Hyper:	Boys.	9	4	8	11	13	9	11	6	7	78	10.758
	Girls.	8	5	8	11	12	8	10	17	4	83	11.448
	Total.	17	9	16	22	25	17	21	23	11	161	22.206
	%	2.344	1.241	2.206	3.034	3.448	2.344	2.896	3.172	1.517		
Hyper: C Astig:	Boys.				1						1	.137
	Girls.			1							1	.137
Emmetr.	Total.			1	1						2	.275
	%			.137	.137							
Hyper: C Emmetr:	Boys.	1									1	.137
	Girls.											
	Total.	1									1	.137
	%	.137										
Hyper: Astig: Simplex	Boys.			2		3	1		1		7	.965
	Girls.		1	1	4	1	1	1		2	11	1.517
	Total.		1	3	4	4	2	1	1	2	18	2.482
	%		.137	.413	.551	.551	.275	.137	.137	.275		
Hyper: Astig: Comp:	Boys.	9	4	11	14	13	27	17	7	5	107	14.758
	Girls.	5	9	18	19	24	32	24	17	8	156	21.517
	Total.	14	13	29	33	37	59	41	24	13	263	36.275
	%	1.931	1.793	4	4.551	5.103	8.137	5.655	3.310	1.793		
Hyper: C Hyper: Astig:	Boys.	4	3	4	4	4	4	9	5		37	5.103
	Girls.	3	4	2	2	4	6	9	6	3	39	5.379
	Total.	7	7	6	6	8	10	18	11	3	76	10.482
	%	.965	.965	.827	.827	1.103	1.379	2.482	1.517	.413		
Simple Comp: Hyper: Astig:	Boys.				1	1	1	1			4	.551
	Girls.	1	1		1	1	2			1	7	.965
	Total	1	1		2	2	3	1		1	11	1.517
	%	.137	.137		.275	.275	.413	.137		.137		
Total per age.	Boys.	23	11	25	31	34	42	38	19	12	235	32.413
	Girls.	17	20	30	37	42	49	44	40	18	297	40.965
	Total.	40	31	55	68	76	91	82	59	30	532	73.378
Per-cent.	Boys.	3.172	1.517	3.448	4.275	4.689	5.793	5.241	2.620	1.655		
	Girls.	2.344	2.758	4.137	5.103	5.793	6.758	6.068	5.517	2.482		
	Total.	5.517	4.275	7.586	9.379	10.482	12.551	11.310	8.137	4.137		

MYOPIA.

S:-		5	6	7	8	9	10	11	12	13	Total	%
pia	Boys				2	2	3	3	1	2	13	1.793
	Girls				4	1	4	1	2	1	13	1.793
	Total				6	3	7	4	3	3	26	3.586
	%				.827	.413	.965	.551	.413	.413		
pic	Boys.		1				2	1			4	.551
tig:	Girls					1	1	4			6	.827
plex	Total		1			1	3	5			10	1.379
	%		.137			.137	.413	.689				
pic	Boys		2	3		3	1	2	4	1	16	2.206
ig:	Girls	1		2	7	5	4	2		1	22	3.034
p:	Total	1	2	5	7	8	5	4	4	2	38	5.241
	%	.137	.275	.689	.965	1.163	.689	.551	.551	.275		
pia	Boys		1		1		2	2	1	1	8	1.103
	Girls				1			2	1	2	6	.827
pic	Total		1		2		2	4	2	3	14	1.931
ig:	%		.137		.275		.275	.551	.275	.413		
p: &												
p:	Boys						2	1			3	.413
pic	Girls					1					1	.137
tig:	Total					1	2	1			4	.551
	%					.137	.275	.137				
pia	Boys											
	Girls				1						1	.137
etr:	Total				1						1	.137
	%				.137							
tal	Boys.		4	3	3	5	10	9	6	4	44	6.068
er	Girls	1		2	13	8	9	9	3	4	49	6.758
	Total	1	4	5	16	13	19	18	9	8	93	12.826
r-	Boys.		.551	.413	.413	.689	1.379	1.241	.827	.551		
t.	Girls	.137		.275	1.793	1.103	1.241	1.241	.413	.551		
	Total	.137	.551	.689	2.206	1.793	2.620	2.482	1.241	1.103		

MIXED ASTIGMATISM.

ES:-		5	6	7	8	9	10	11	12	13	Total	%
ixed	Boys.		1	2	2	5	5	3	3	1	22	3.034
stig:	Girls		2	4	4	8	4	3	4		29	4
	Total		3	6	6	13	9	6	7	1	51	7.034
	%		.413	.827	.827	1.793	1.241	.827	.965	.137		
yper:	Boys					1	1				2	.275
c	Girls											
ixed	Total					1	1				2	.275
stig:	%					.137	.137					
imple												
yper:	Boys									2	2	.275
stig:c	Girls		2	2	1	1	1	2			9	1.241
ixed	Total		2	2	1	1	1	2		2	11	1.517
stig:	%		.275	.275	.137	.137	.137	.275		.275		
omp:												
yper:	Boys				1		2	1		1	5	.689
stig:c	Girls				1	1	1	3	1		7	.965
ixed	Total				2	1	3	4	1	1	12	1.655
stig:	%				.275	.137	.413	.551	.137	.137		
imple												
yopic	Boys					1					1	.137
stig:c	Girls								1	1	2	.275
ixed	Total					1			1	1	3	.413
stig:	%					.137			.137	.137		
omp:												
yopic	Boys			1			2				3	.413
stig:c	Girls					2	2	1	3		8	1.103
ixed	Total			1		2	4	1	3		11	1.517
stig:	%			.137		.275	.551	.137	.413			
otal	Boys		1	3	3	7	10	4	3	4	35	4.827
ber	Girls		4	6	6	12	8	9	9	1	55	7.586
ge.	Total		5	9	9	19	18	13	12	5	90	12.413
er-	Boys		.137	.413	.413	.965	1.379	.551	.413	.551		
ent	Girls		.551	.827	.827	1.655	1.103	1.241	1.241	.137		
	Total		.689	1.241	1.241	2.620	2.482	1.793	1.655	.689		

HYPERMETROPIA & MYOPIA.

S:-		5	6	7	8	9	10	11	12	13	Total	%
er:	Boys.			1							1	.137
	Girls.			1		1					2	.275
pia	Total.			2		1					3	.413
	%			.275		.137						
p:												
er:	Boys.											
ig:c	Girls.					1					1	.137
p:	Total					1					1	.137
pic	%					.137						
ig:												
opia												
Simple	Boys.							1			1	.137
per:	Girls.											
tig:	Total.							1			1	.137
	%							.137				
al	Boys.			1				1			2	.275
r	Girls.			1		2					3	.413
.	Total.			2		2		1			5	.689
er-	Boys.			.137				.137				
nt.	Girls.			.137		.275						
	Total			.275		.275		.137				

EMMETROPIA.

AGES:-		5	6	7	8	9	10	11	12	13	Total	%
Normal Asthen-opia.	Boys					1					1	.137
	Girls.			1					1	1	3	.413
	Total.			1		1			1	1	4	.551
	%			.137		.137			.137	.137		
Normal Conjunct:	Boys.		1								1	.137
	Girls.											
	Total		1								1	.137
	%		.137									

Total		
Boys.	2	.275
Girls.	3	.413
Total	5	.689

A P P E N D I X 3.

(GROUP 2)

CASES IN WHICH ATROPINE, OR HOMATROPINE WAS USED, AND REFRACTIONS TAKEN.

Worked out to the Percentage of each Section.

HYPERMETROPIA.

S:-		5	6	7	8	9	10	11	12	13	Total	%
er:	Boys.	9	4	8	11	13	9	11	6	7	78	14.662
	Girls.	8	5	8	11	12	8	10	17	4	83	15.601
	Total	17	9	16	22	25	17	21	23	11	161	30.263
	%	3.195	1.691	3.007	4.135	4.699	3.195	3.947	4.323	2.067		
per:	Boys.				1						1	.187
	Girls.			1							1	.187
eg:	Total.			1	1						2	.375
mea.	%			.187	.187							
per:	Boys.	1									1	.187
etr:	Girls.											
	Total.	1									1	.187
	%	.187										
per:	Boys.			2		3	1		1		7	1.315
tig:	Girls.		1	1	4	1	1	1		2	11	2.067
plex.	Total.		1	3	4	4	2	1	1	2	18	3.383
	%		.187	.563	.751	.751	.375	.187	.187	.375		
per:	Boys.	9	4	11	14	13	27	17	7	5	107	20.112
tig:	Girls.	5	9	18	19	24	32	24	17	8	156	29.323
p:	Total	14	13	29	33	37	59	41	24	13	263	49.436
	%	2.631	2.445	5.451	6.203	6.954	11.090	7.706	4.511	2.445		
per:	Boys.	4	3	4	4	4	4	9	5		37	6.954
	Girls.	3	4	2	2	4	6	9	6	3	39	7.330
per:	Total	7	7	6	6	8	10	18	11	3	76	14.285
tig:	%	1.315	1.315	1.127	1.127	1.503	1.879	3.383	2.067	.563		
mple												
omp:	Boys.				1	1	1	1			4	.751
per:	Girls.	1	1		1	1	2			1	7	1.315
tig:	Total.	1	1		2	2	3	1		1	11	2.067
	%	.189	.189		.375	.375	.563	.187		.187		
al	Boys.	23	11	25	31	34	42	38	19	12	235	44.172
	Girls.	17	20	30	37	42	49	44	40	18	297	55.827
	Total	40	31	55	68	76	91	82	59	30	532	100
er-	Boys	4.323	2.067	4.699	5.827	6.390	7.894	7.142	3.571	2.255		
nt.	Girls	3.195	3.759	5.639	6.954	7.894	9.210	8.270	7.518	3.383		
	Total	7.518	5.827	10.338	12.781	14.285	17.120	15.413	11.090	5.639		

MYOPIA.

GS:-		5	6	7	8	9	10	11	12	13	Total	%
pia	Boys.				2	2	3	3	1	2	13	13.978
	Girls				4	1	4	1	2	1	13	13.978
	Total				6	3	7	4	3	3	26	27.956
	%				6.450	3.225	7.526	4.301	3.225	3.225		
pic	Boys.		1				2	1			4	4.301
tig:	Girls.					1	1	4			6	6.450
plex	Total		1			1	3	5			10	10.752
	%		1.075			1.075	3.225	5.376				
pic	Boys.		2	3		3	1	2	4	1	16	17.204
tig:	Girls.1			2	7	5	4	2		1	22	23.655
p:	Total 1		2	5	7	8	5	4	4	2	38	40.860
	%	1.075	2.150	5.376	7.526	8.279	5.376	4.301	4.301	2.150		
pia												
	Boys.		1		1		2	2	1	1	8	8.279
pic	Girls				1			2	1	2	6	6.451
tig:	Total		1		2		2	4	2	3	14	15.053
	%		1.075		2.150		2.150	4.301	2.150	3.225		
mple												
Comp:	Boys.						2	1			3	3.225
pic	Girls					1					1	1.075
tig:	Total					1	2	1			4	4.301
	%					1.075	2.150	1.075				
pia	Boys											
	Girls.				1						1	1.075
metr:	Total				1						1	1.075
	%				1.075							
tal	Boys		4	3	3	5	10	9	6	4	44	47.313
r	Girls	1		2	13	8	9	9	3	4	49	52.688
e.	Total	1	4	5	16	13	19	18	9	8	93	100
r-	Boys.		4.301	3.225	3.225	5.376	10.752	9.677	6.451	4.301		
nt.	Girls	1.075		2.150	13.978	8.279	9.677	9.677	3.225	4.301		
		1.075	4.301	5.376	17.204	13.978	20.430	19.354	9.677	8.279		

MIXED ASTIGMATISM.

GS:-		5	6	7	8	9	10	11	12	13	Total	%
ixed	Boys		1	2	2	5	5	3	3	1	22	24.4
stig:	Girls.		2	4	4	8	4	3	4		29	32.2
	Total		3	6	6	13	9	6	7	1	51	56.6
	%		3.3	6.6	6.6	14.4	10	6.6	7.7	1.1		
per:	Boys					1	1				2	2.2
	Girls											
ixed	Total					1	1				2	2.2
stig:	%					1.1	1.1					
imple												
per:_	Boys									2	2	2.2
stig:c	Girls		2	2	1	1	1	2			9	10
ixed	Total		2	2	1	1	1	2		2	11	12.2
stig:	%		2.2	2.2	1.1	1.1	1.1	2.2		2.2		
omp:												
per:_	Boys				1		2	1		1	5	5.5
stig:c	Girls				1	1	1	3	1		7	7.7
ixed	Total				2	1	3	4	1	1	12	13.3
stig:	%				2.2	1.1	3.3	4.4	1.1	1.1		
imple												
yopic_	Boys					1					1	1.1
stig:c	Girls								1	1	2	2.2
ixed	Total					1			1	1	3	3.3
stig:	%					1.1			1.1	1.1		
omp:												
yopic_	Boys			1			2				3	3.3
stig:c	Girls					2	2	1	3		8	8.8
ixed	Total			1		2	4	1	3		11	12.2
stig:	%			1.1		2.2	4.4	1.1	3.3			
otal	Boys.		1	3	3	7	10	4	3	4	35	38.8
er	Girls		4	6	6	12	8	9	9	1	55	61.1
ge.	Total		5	9	9	19	18	13	12	5	90	100
Per-	Boys		1.1	3.3	3.3	7.7	11.1	4.4	3.3	4.4		
cent.	Girls		4.4	6.6	6.6	13.3	8.8	9.9	9.9	1.1		
	Total		5.5	9.9	9.9	21.1	20	14.4	13.3	5.5		

HYPERMETROPIA c MYOPIA.

AGES:-		5	6	7	8	9	10	11	12	13	Total	%
Hyper: c Myopia	Boys			1							1	20
	Girls			1		1					2	40
	Total			2		1					3	60
	%			40		20						
Comp: Hyper: c Astig: Comp: Myopic Astig:	Boys											
	Girls					1					1	20
	Total					1					1	20
	%					20						
Myopia c Simple Hyper: Astig:	Boys							1			1	20
	Girls											
	Total							1			1	20
	%							20				

Total

Boys	2	40
Girls	3	60
Total	5	100

EMMETROPIA

AGES:-		5	6	7	8	9	10	11	12	13	Total	%
Asthenopia	Boys					1					1	20
	Girls			1					1	1	3	60
	Total			1		1			1	1	4	80
	%			20		20			20	20		
Conjunct- avitis	Boys		1								1	20
	Girls											
	Total		1								1	20
	%		20									

Total

Boys	2	40
Girls	3	60
Total	5	100

A P P E N D I X 4.

(GROUP 2)

THE DEGREE OF EACH SUB-GROUP OF HYPERMETROPIA.

HYPERMETROPIA - SHOWING DEGREE.

AGES:-		5	6	7	8	9	10	11	12	13	Total.
-1D to -2D	Boys	1	1	2	1	7	5	3	1	3	24
	Girls	1	1	1	5	2	4	2	9	1	26
	Total	2	2	3	6	9	9	5	10	4	50
-2D to -3D	Boys	2	2	1	3	2	2	4	1	1	18
	Girls	1		1	2	1	3	5	3	2	18
	Total	3	2	2	5	3	5	9	4	3	36
-3D to- 4D	Boys	2		1	1				2		6
	Girls			2	1	3	1	1	1		9
	Total	2		3	2	3	1	1	3		15
-4D to- 5D	Boys	2			4				1		7
	Girls	2	1	2	1	2			2		10
	Total	4	1	2	5	2			3		17
-5D to- 6D	Boys	1		2				1		1	5
	Girls	1		1	1		1		1		5
	Total	2		3	1		1	1	1	1	10
-6D to- 7D	Boys			2	1	2		1	1	1	8
	Girls	2	2		1	2		1	1		9
	Total	2	2	2	2	4		2	2	1	17
-7D to-8D	Boys		1		1						2
	Girls					1				1	2
	Total		1		1	1				1	4
-8D to- 9D	Boys										
	Girls	1									1
	Total	1									1
-9D to-10D	Boys						1	1			2
	Girls										
	Total						1	1			2
-10D to-11D	Boys										
	Girls					1					1
	Total					1					1
Total	Boys	8	4	8	11	11	8	10	6	6	72
"	Girls	8	4	7	11	12	9	9	17	4	81
	Total	16	8	15	22	23	17	19	23	10	153
Irregular	Boys	1				2		1		1	
	Girls		1	1				1			
									Total		8
											161

HYPERMETROPIA SIMPLEX.

"Irregular Cases" i.e. Having different degrees of Hypermetropia in each eye.

1 boy aged 5. +4.5 in right eye + 6 in the left.

1 girl " 6 + 3 in right eye + 5 in the left.

1 girl aged 7 + 5 in right eye + 7 in the left.

1 boy aged 9 + 1.5 in right eye +4 in the left.

1 boy aged 9 + 2 in right eye + 5 in the left.

1 girl aged 11 + 4.5 in right eye. + 6 in the left.

1 girl aged 11 + 3.5 in right eye. + 2 in the left.

1 boy aged 13 + 6 in right eye + 4.5 in the left.

SIMPLE HYPERMETROPIC ASTIGMATISM
Showing Degree.

AGES:-		5	6	7	8	9	10	11	12	13	Total
+ 1D	Boys			1		2					3
	Girls		1	1							2
	Total		1	2		2					5
+ 2D	Boys								1		1
	Girls				3			1			4
	Total				3			1	1		5
+ 3D	Boys										
	Girls					1	1			2	4
	Total					1	1			2	4
+ 4D	Boys			1		1	1				3
	Girls										
	Total			1		1	1				3
+ 5D	Boys										
	Girls				1						1
	Total				1						1
Total	Boys			2		3	1		1		7
	Girls		1	1	4	1	1	1		2	11
	Total		1	3	4	4	2	1	1	2	18

COMPOUND HYPERMETROPIC ASTIGMATISM
Showing Degree.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Small Spherical											
(+3D & under) c	Boys.		1		4	2	2	3			12
Small Astig:	Girls		1	2		7	4	5	1	2	22
(+.5D)	Total.		2	2	4	9	6	8	1	2	34
Small Spherical											
(+3D & under) c	Boys	2	1	5	3	4	10	4	2		31
Small Astig:	Girls	2	3	10	9	5	15	7	7	6	64
(+3D & under)	Total	4	4	15	12	9	25	11	9	6	95
Small Spherical											
(+3D & under) c	Boys				2	2	4	2	1	1	12
Large Astig:	Girls.				3	5	6	4	2		20
(over +3D)	Total				5	7	10	6	3	1	32
Large Spherical											
(over +3D) c	Boys	1		1			1				3
Small Astig:	Girls.							1			1
(+.5D)	Total	1		1			1	1			4
Large Spherical											
(over +3D) c	Boys	6	2	3	3	5	9	8	3	4	43
Small Astig:	Girls	3	4	4	6	6	6	7	4		40
(+3D & under)	Total	9	6	7	9	11	15	15	7	4	83
Large Spherical											
(over +3D) c	Boys.			1	1		1				3
Large Astig:	Girls			1		1					2
(over +3D)	Total			2	1	1	1				5
Total	Boys	9	4	10	13	13	27	17	6	5	104
"	Girls	5	8	17	18	24	31	24	14	8	149
	Total	14	12	27	31	37	58	41	20	13	253
Irregular	Boys			1	1				1		
	Girls		1	1	1		1		3		

Total 10
263

HYPERMETROPIC ASTIGMATISM COMPOUND.

"Irregular Cases" i.e. Where the degree differed in both eyes so that we were unable to place them in one of the sub-groups.

---

1 girl at 6. Right eye. + 4 + 6 Left eye. + 1.5 + 3.5.

1 boy at 7. Right eye. + 4.5 + 4 Left eye. + 2 + 1.5

1 girl at 7. Right eye. + 1.5 + 7 Left eye. + 2.5 + 4

1 girl at 10. Right eye. + 3 + 4 Left eye. + 4.5 + 8or9

1 boy at 12 Right eye. + 4.5 + 2 Left eye. + 6 + 4.5

1 girl at 12 Right eye. + 3 + 5 Left eye. + 1 or0.5 + 7

1 girl at 12. Right eye. + 5 + 5 Left eye. + 4 + 2.5

1 girl at 12. Right eye. + 2.5 + 5 Left eye. + 2.5 + 7

1 boy at 8. Right eye. + 4.5 + 5 Left eye. + 2 + 1.5

1 girl at 8 Right eye. + 4.5 + 6 Left eye. + 3 + 5.5

Hypermetropia c Hyper: Astig: Compound

Right Eye.

Left Eye.

Hypermetropia.

	Ages:-	5	6	7	8	9	10	11	12	13	Total
	Boys			1				1			2
D	Girls										
	Total			1				1			2
	Boys	2			1	1					4
D	Girls					2		2	1		5
	Total	2			1	3		2	1		9
	Boys				1						1
D	Girls				1			1			2
	Total				2			1			3
	Boys		2					1			3
D	Girls										
	Total		2					1			3
	Boys					1					1
D	Girls	1	1	1		1					4
	Total	1	1	1		2					5
	Boys		1					1			2
D	Girls							1			1
	Total		1					2			3
	Boys										
D	Girls									1	1
	Total									1	1
	Boys										
D	Girls										
	Total										
	Boys	1		1							2
D	Girls		1								1
	Total	1	1	1							3
	Boys	3	3	1	3	2		3			15
al	Girls	1	1	2	1	3		4	1	1	14
	Total	4	4	3	4	5		7	1	1	29

Small Sph: c Small astig (under +3D) +0.5 of Astig:

	Ages:-	5	6	8	9	11	12	Total
	Boys							
D	Girls				1	1	1	3
	Total				1	1	1	3
	Boys	1		1	1			3
D	Girls							
	Total	1		1	1			3
	Boys				1			1
D	Girls							
	Total				1			1
	Boys		1					1
D	Girls							
	Total		1					1
	Boys							
D	Girls							
	Total							
	Boys							
D	Girls							
	Total							
	Boys							
al	Girls				1	2		3
	Total				1	2		3

Small astig (under +3D)

	Ages:-	6	7	8	9	11	Total
	Boys		1			1	2
D	Girls						
	Total		1			1	2
	Boys						
D	Girls				1		1
	Total				1		1
	Boys		1				1
D	Girls				1		1
	Total		1		1		2
	Boys	1					1
D	Girls				1		1
	Total	1			1		2
	Boys						
D	Girls						
	Total						
	Boys						
D	Girls						
	Total						
	Boys						
al	Girls				1		1
	Total				1		1

Large Sph: c Small Astig +0.5 of Astig

	Ages:-	5	9	Total
	Boys	1		1
D	Girls		1	1
	Total	1	1	2
	Boys			
D	Girls			
	Total			
	Boys			
D	Girls			
	Total			
	Boys			
D	Girls			
	Total			
	Boys			
D	Girls			
	Total			
	Boys			
al	Girls			
	Total			

Large Sph: Large c Astig

	Ages:-	5	6	7	13	Total
	Boys					2
D	Girls					
	Total					2
	Boys					4
D	Girls					5
	Total					9
	Boys					1
D	Girls					2
	Total					3
	Boys		1			3
D	Girls					
	Total		1			3
	Boys					1
D	Girls	1	1	1		4
	Total	1	1	1		5
	Boys					2
D	Girls					1
	Total					3
	Boys					
D	Girls				1	1
	Total				1	1
	Boys					
D	Girls					
	Total					
	Boys					2
D	Girls					1
	Total					3
	Boys			1		15
al	Girls	1	1	1	1	14
	Total	1	2	1	1	29

Hypermetropia c Hyper: Astig: Compound.

Left Eye.

Hypermetropia.

	5	6	7	8	9	10	11	12	13	Total
Boys						1		1		2
Girls						2	1			3
Total						3	1	1		5
Boys					1			1		2
Girls	1			1		1	1	2		6
Total	1			1	1	1	1	3		8
Boys			1				3	1		5
Girls		1			1	1	2		1	6
Total		1	1		1	1	5	1	1	11
Boys			1			1	1	1		4
Girls						1				1
Total			1			2	1	1		5
Boys					1			1		2
Girls	1	1				1				3
Total	1	1			1	1		1		5
Boys										
Girls								1	1	2
Total								1	1	2
Boys							2			2
Girls		1						1		2
Total		1					2	1		4
Boys	1									1
Girls							1			1
Total	1						1			2
Boys						1				1
Girls								1		1
Total						1		1		2
Boys			1							1
Girls										
Total			1							1
Boys						1				1
Girls										
Total						1				1
Boys				1						1
Girls										
Total				1						1
Boys	1		3	1	2	4	6	5		22
Girls	2	3		1	1	6	5	5	2	25
Total	3	3	3	2	3	10	11	10	2	47

Right Eye

Small Spherical c Small Astig: (under +3D) +0.5D of Astig:

	5	6	7	8	9	10	11	12	13	Total
Boys						1		1		2
Girls						2	1			3
Total						3	1			5
Boys					1		1			2
Girls	1			1		1	1	2		6
Total	1			1	1	1	1	3		8
Boys			1			1				5
Girls		1						1		6
Total		1	1			1		1		11
Boys			1			1				4
Girls										1
Total			1			1				5
Boys					1			1		2
Girls			1							3
Total			1		1			1		5
Boys										
Girls								1		2
Total								1		2
Boys										2
Girls										2
Total										4
Boys										1
Girls										1
Total										2
Boys										1
Girls										1
Total										2
Boys										1
Girls										
Total										1
Boys										1
Girls										
Total										1
Boys										1
Girls										
Total										1
Boys	1				1	2	1	2	1	22
Girls	1	1		1		3	2	2	1	25
Total	2	1	1	1	1	5	3	4	2	47

Right Eye

+0.5 of Astig

	12
Boys	1
Girls	
Total	1
Boys	
Girls	
Total	
Boys	
Girls	
Total	
Boys	1
Girls	
Total	1
Boys	
Girls	
Total	
Boys	
Girls	
Total	
Boys	
Girls	
Total	
Boys	
Girls	
Total	
Boys	
Girls	
Total	
Boys	1
Girls	
Total	1
Boys	1
Girls	1
Total	2

Large Spherical (over +3D) c Small Astig:

	5	6	7	9	10	11	12	13	Total
Boys									
Girls									
Total									
Boys									
Girls									
Total									
Boys						1	1		2
Girls				1					1
Total				1		1	1		3
Boys									
Girls									
Total									
Boys									
Girls	1	1							2
Total	1	1							2
Boys					2				2
Girls		1				1			2
Total		1			2	1			4
Boys	1								1
Girls					1				1
Total	1				1				2
Boys				1					1
Girls						1			1
Total				1		1			2
Boys			1						1
Girls									
Total			1						1
Boys				1					1
Girls									
Total				1					1
Boys									
Girls									
Total									
Boys	1	1		2	3	1			22
Girls	1	2	1		2	1	2	1	25
Total	2	2	1	2	4	3	1	1	47

Large Sph: c Large Astig

	8	Total
Boys		2
Girls		3
Total		5
Boys		2
Girls		6
Total		8
Boys		5
Girls		6
Total		11
Boys		4
Girls		1
Total		5
Boys		2
Girls		3
Total		5
Boys		
Girls		2
Total		2
Boys		2
Girls		2
Total		4
Boys		1
Girls		1
Total		2
Boys		1
Girls		1
Total		2
Boys		1
Girls		
Total		1
Boys		1
Girls		
Total		1
Boys		1
Girls		
Total		1
Boys	1	1
Girls		
Total	1	1
Boys	1	22
Girls		25
Total	1	47

A P P E N D I X 5 .

(GROUP 2)

THE DEGREE OF EACH SUB-GROUP OF MYOPIA.

MYOPIA. Showing Degree.

AGES:-		5	6	7	8	9	10	11	12	13	Total
-1D to -2D	Boys				1			2	1	1	5
	Girls.						1				1
	Total				1		1	2	1	1	6
-2D to -3D	Boys									1	1
	Girls				2			1	1	1	5
	Total				2			1	1	3	6
-3D to -4D	Boys						1	1			2
	Girls						2				2
	Total						3	1			4
-4D to -5D	Boys				1						1
	Girls						1		1		2
	Total				1		1		1		3
-5D to -6D	Boys						1				1
	Girls				1						1
	Total				1		1				2
-6D to -7D	Boys					1					1
	Girls				1						1
	Total				1	1					2
-8D to -9D	Boys										
	Girls					1					1
	Total					1					1
Total	Boys				2	1	2	3	1	2	11
"	Girls				4	1	4	1	2	1	13
	Total				6	2	6	4	3	3	24
Irregular	Boys					1	1				
	Girls										

Total 2

26

SIMPLE MYOPIC ASTIGMATISM. Showing Degree.

AGES:-		5	6	7	8	9	10	11	12	13	Total
- 1D	Boys		1								1
	Girls						1				1
	Total		1				1				2
- 2D	Boys						1				1
	Girls							1			1
	Total						1	1			2
- 3D	Boys						1				1
	Girls					1		2			3
	Total					1	1	2			4
— 6D	Boys							1			1
	Girls										
	Total							1			1
Total	Boys						2	1			3
	Girls		1			1	1	3			6
	Total		1			1	3	4			9
Irregular	Girls							1			
								Total			1 / 10

MYOPIA SIMPLEX.

"Irregular Cases" i.e. Having different degrees of Myopia in each eye.

---

1 boy at 9. Right eye. —2.5 Left eye. — 4.5

1 boy at 10. Right eye. —0.5 Left eye. — 4.

SIMPLE MYOPIC ASTIGMATISM.

"Irregular Cases" i.e. Having different degrees of Astigmatism in each eye.

---

1 girl at 11. Right eye. —2 Ems. Left eye. —4.5 Ems.

COMPOUND MYOPIC ASTIGMATISM.
Showing Degree.

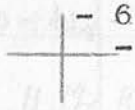
AGES:-		5	6	7	8	9	10	11	12	13	Total
Small Spherical (-3D & under) c	Boys								1		1
Small Astig:	Girls						1				1
(-.5D)	Total						1		1		2
Small Spherical (-3D & under) c	Boys					2	1	1		1	5
Small Astig:	Girls			1	2		2	1			6
(-3D & under)	Total			1	2	2	3	2		1	11
Small Spherical (-3D & under) c	Boys			2							2
Large Astig:	Girls				1						1
(over -3D)	Total			2	1						3
Large Spherical (over -3D) c	Boys					1			2		3
Small Astig:	Girls	1			3	1	1	1		1	8
(-3D & under)	Total	1			3	2	1	1	2	1	11
Large Spherical (over -3D) c	Boys		1	1				1	1		4
Large Astig:	Girls					1					1
(over -3D)	Total		1	1		1		1	1		5
Total "	Boys		1	3		3	1	2	4	1	15
	Girls	1		1	6	2	4	2		1	17
	Total	1	1	4	6	5	5	4	4	2	32
Irregular	Boys		1	1							
	Girls				1	3					

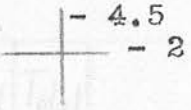
Total 6
38

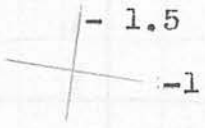
COMPOUND MYOPIC ASTIGMATISM.

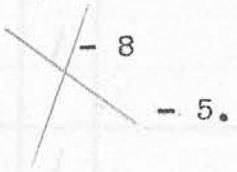
"Irregular Cases" i.e. Where the degree differed in both eyes so that we were unable to place them in one of the sub-groups.

---

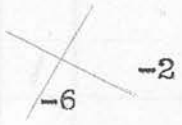
1 boy at 6. Right eye. 

Left eye. 

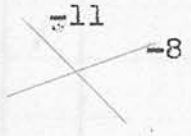
1 boy at 7 Right eye. 

Left eye. 

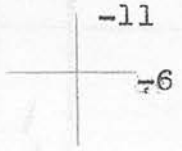
1 girl at 8. Right eye. 

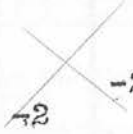
Left eye. 

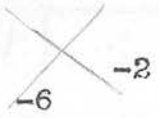
1 girl at 9. Right eye. 

Left eye. 

1 girl at 9. Right eye. 

Left eye. 

1 girl at 9. Right eye. 

Left eye. 

Myopia. C. Myopic Astig: Compound.

Right Eye. Left Eye.

Myopia.

...es:—		5	6	7	8	9	10	11	12	Total	Small Sph: C (under +3D) +0.5 of Astig	8	11	12	Small Astig (under +3D) 10	11	Small Sph: C Large Astig 10	11	Large Sph: C Small Astig: 9	10	11	Total
...D	Boys																					
	Girls								1	1			1									1
	Total								1	1			1									1
...D	Boys							1		1						1						1
	Girls																					
	Total							1		1						1						1
...D	Boys																					
	Girls				1					1		1										1
	Total				1					1		1										1
...D	Boys																					
	Girls																					
	Total																					
...D	Boys																					
	Girls							1		1								1				1
	Total							1		1								1				1
...D	Boys						1			1										1		1
	Girls																					
	Total						1			1										1		1
...tal.	Boys						1	1		2					1					1		2
	Girls				1			1	1	3	1		1					1				3
	Total				1		1	2	1	5	1		1		1			1		1		5

Myopia c Myopic Astig: Compound.

Left Eye

Right Eye

Myopia.

		5	6	7	8	9	10	11	12	13	Total
	Boys								1		1
D	Girls										
	Total								1		1
	Boys		1								1
D	Girls							1			1
	Total		1					1			2
	Boys									1	1
D	Girls										
	Total									1	1
	Boys										
D	Girls									1	1
	Total									1	1
	Boys						1	1			2
D	Girls									1	1
	Total						1	1		1	3
	Boys				1						1
D	Girls										
	Total				1						1
	Boys		1		1		1	1	1	1	6
tal	Girls							1		2	3
	Total		1		1		1	2	1	3	9

Small Sph: c Small Astig (under +3D)

	+0.5 of Astig: 11	12	Total
Boys		1	1
Girls	1		1
Total	1	1	2

Small Sph: c Small Astig (under +3D)

	5	6	Total
Boys	1		1
Girls			
Total	1		1

Large Sph: c Small Astig

	12	13	Total
Boys			
Girls	1		1
Total	1		1

Large Sph: c Large Astig:

	8	10	11	13	Total
Boys	1				1
Girls				1	1
Total	1			1	2

Large Sph: c Large Astig:

	8	10	11	13	Total
Boys		1	1		2
Girls				1	1
Total		1	1	1	3

Large Sph: c Large Astig:

	8	10	11	13	Total
Boys	1				1
Girls					
Total	1				1

Large Sph: c Large Astig:

	8	10	11	13	Total
Boys	1	1	1	1	6
Girls				1	3
Total	1	1	1	2	9

A P P E N D I X 6.

GIVING THE COMPLICATIONS AND NUMBER OF CASES OF EACH SUB-GROUP OF GROUP 2.

	Hypermetropia.	Hyper: Astig: Simplex	Hyper: Astig: Compound.	Hyper: c Hyper: Astig:	Simple + Comp: Hyper: Astig:	Myopia.	Myopic Astig: Simplex	Myopic Astig: Compound.	Myopic Astig: Simple + Comp:	Myopia c Myopic Astig:	Mixed Astig:	Hyper c Mixed Astig:	Simple Hyper: Astig: c Mixed Astig:	Comp: Hyper: Astig: c Mixed Astig:	Myopic Astig: c Mixed Astig:	Hyper: c Myopia	Compound Hyper: Astig: c Comp: Myopic Astig:	Retinoscopy Impossible	Total.
Conjunctivitis	13	1	10	4			1	1		2									32
Phlyct.Conjunct.	3		2	1		1													7
Blepharitis	20	2	20	6	1		1	5		1	5	1	4	2	1				69
Keratitis	2		4	1				1						1					9
Marginal Keratitis	2		2	1				1			1								7
Maculae & Nebulae		1	6	4				1			3	1		1	1				18
Ulcer of Cornea			6	4														1	11
Blepherospasm	4	1	2																7
Conv.Com.Strab.	15	1	32	13				1						1	1	1			65
Left Int.Strab.	18	1	22	9										1				1	52
Right Int.Strab.	7		19	5	1			1			1								34
Diverg.Strab.			3	2															5
Left Diverg. Strab.			1					1											2
Right Diverg. Strab.						2		1			1								4
Meibomian Cysts.	1																		1
Conical Cornea	1																		1
Congenital Cataract	1				1								1						3
Haziness of Vitreous	1															1			2

(Continued)

	Hypermetropia.	Hyper: Astig: Simplex	Hyper: Astig: Compound.	Hyper: c̄ Hyper: Astig:	Simple + Comp: Hyper: Astig:	Myopia.	Myopic Astig: Simplex	Myopic Astig: Compound.	Myopic Astig: Simple + Compound.	Myopia c̄ Myopic Astig:	Mixed Astig:	Hyper: c̄ Mixed Astig:	Simple Hyper: Astig: c̄ Mixed Astig:	Comp: Hyper: Astig: c̄ Mixed Astig:	Myopic Astig: c̄ Mixed Astig:	Hyper: c̄ Myopia.	Compound Hyper: Astig: c̄ Comp: Myopic Astig:	Retinoscopy Impossible.	
Triangular Opacity of Lens			1															1	
Ant. Polar Cataract														1				1	
Coloboma of Choroid (left)	1																	1	
Optic Atrophy (Right & Left)	2		1				1	1			1							6	
Changes at Maculae	3		1															4	
Pain in Head	10	2	9	9			1					1						34	
Pain in Eyes	5		2	1														8	
Cong. Ptosis of both eyes			2															2	
Ptosis of Left			1															1	
Clonic Contract. of Orbicularis			1															1	
Dermoid at Angle Left Eye			1															1	
Mystagmus			2			1		1			3							7	
Photophobia (no inflam.)			1															1	
Mentally deficient due to injury			1															1	
Amblyopia (Left)	8		5	2														15	
Amblyopia (Right)	5		6	1	1								1					14	

(Continued)

	Hypermetropia.	Hyper: Astig: Simplex	Hyper: Astig: Compound.	Hyper: c Hyper: Astig:	Simple + Comp: Hyper: Astig:	Myopia.	Myopic Astig: Simplex	Myopic Astig: Compound.	Myopic Astig: Simple + Comp:	Myopia c Myopic Astig:	Mixed Astig:	Hyper: c Mixed Astig:	Simple Hyper: Astig: c Mixed Astig:	Comp: Hyper: Astig: c Mixed Astig:	Myopic Astig: c Mixed Astig:	Hyper: c Myopia.	
Congested Discs			4		1			3									8
Cupping of Discs			1				1										2
Choroidal Changes Myopic Crescents			1		1	1	2	12	2	5	4				4	1	33
Black Ring at Disc			1														1
Curved Edges of Disc			1														1
Medulated Nerve Fibres at O.D.			1			1		1									3
Grey Optic Discs						1											1
Dark Fundi															1		1
Outline of O.D. indistinct				2													2
Vertigo				1													1
Old Iritis					1												1
High Myopic Extraction							1										1
Lacrymal Abscess										1							1
Hordeolus											1				1	1	2
Wound of Cornea c Prolapse of Iris											1						1
Hyalitis												1					1
Albino											1						1
"Bad Stomach"											1						1

A P P E N D I X 7.

GIVING THE AGES AND SUB-GROUPS IN WHICH THE PRINCIPAL COMPLICATIONS OF GROUP 2 OCCUR.

CONJUNCTIVITIS.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hypermetropia	Boys	2				1	1		1	1	6
	Girls					2		2	3		7
	Total	2				3	1	2	4	1	13
Hyper: Astig: Simplex.	Boys			1							1
	Girls										
	Total			1							1
Hyper: Astig: Compound.	Boys			2	1						3
	Girls	1			1	1			2	2	7
	Total	1		2	2	1			2	2	10
Hyper: $\overline{c}$ Hyper: Astig:	Boys	1							1		2
	Girls		1						1		2
	Total	1	1						2		4
Myopic Astig: Simplex	Boys										
	Girls						1				1
	Total						1				1
Myopic Astig: Compound	Boys			1							1
	Girls										
	Total			1							1
Myopia $\overline{c}$ Myopic Astig:	Boys									2	2
	Girls										
	Total									2	2
Total	Boys	3		4	1	1	1		2	3	15
"	Girls	1	1		1	3	1	2	6	2	17
	Total	4	1	4	2	4	2	2	8	5	32

PHLYCTENULAR CONJUNCTIVITIS.

ES:-		5	6	7	8	9	10	11	12	13	Total
ermetropia.	Boys		1								1
	Girls			1			1				2
	Total		1	1			1				3
yper: Astig:	Boys.										
Compound.	Girls			1				1			2
	Total			1				1			2
Hyper: $\overline{c}$	Boys					1					1
yper: Astig:	Girls										
	Total					1					1
Myopia	Boys										
	Girls				1						1
	Total				1						1
Total	Boys		1			1					2
"	Girls			2	1		1	1			5
	Total		1	2	1	1	1	1			7

BLEPHARITIS.

AGES:-		5	6	7	8	9	10	11	12	13	Total.
Hypermetropia	Boys	1	1	1	1			4	1		9
	Girls	1	1		1	3	3		2		11
	Total	2	2	1	2	3	3	4	3		20
Hyper: Astig: Simplex	Boys										
	Girls		1					1			2
	Total		1					1			2
Hyper : Astig: Compound.	Boys					2	2	1			5
	Girls		2	4	1	1	3	3	1		15
	Total		2	4	1	3	5	4	1		20
Hyper: $\overline{c}$ Hyper: Astig:	Boys		1					1			2
	Girls	1	2			1					4
	Total	1	3			1		1			6
Simple $\overline{c}$ Compound Hyper: Astig:	Boys										
	Girls									1	1
	Total									1	1
Myopic Astig: Simplex.	Boys										
	Girls.								1		1
	Total								1		1
Myopic Astig: Compound	Boys			1					1		2
	Girls					1	1	1			3
	Total			1		1	1	1	1		5
Myopia $\overline{c}$ Myopic Astig:	Boys										
	Girls			1							1
	Total			1							1
Mixed Astigmatism	Boys					1	1				2
	Girls		1		1		1				3
	Total		1		1	1	2				5
Hyper: $\overline{c}$ Mixed Astig:	Boys					1					1
	Girls										
	Total					1					1
Simple Hyper: Astig: c Mixed Astig:	Boys										
	Girls		1	1	1	1					4
	Total		1	1	1	1					4
Comp: Hyper: Astig: c Mixed Astig:	Boys						1				1
	Girls					1					1
	Total					1	1				2
Myopic Astig: c Mixed Astig:	Girls									1	1
	Total									1	1
Total	Boys	1	2	2	1	4	4	6	2	2	24
"	Girls	2	8	6	4	8	8	5	4		45
	Total	3	10	8	5	12	12	11	6	2	69

BLEPHEROSPASM.

ES:-		5	6	7	8	9	10	11	12	13	Total
ypermetropia.	Boys						1			1	2
	Girls				2						2
	Total				2		1			1	4
yper: Astig: Simple	Boys										
	Girls		1								1
	Total		1								1
yper: Astig: Compound.	Boys										
	Girls					1		1			2
	Total					1		1			2
Total	Boys						1			1	2
"	Girls		1		2	1		1			5
	Total		1		2	1	1	1		1	7

KERATITIS.

GES:-		5	6	7	8	9	10	11	12	13	Total.
ypermetropia	Boys.										
	Girls.			1			1				2
	Total			1			1				2
yper: Astig: Compound	Boys			1			1				2
	Girls		1	1							2
	Total		1	2			1				4
yper: $\overline{c}$ yper: Astig:	Boys										
	Girls	1									1
	Total	1									1
yopic Astig: Compound.	Boys										
	Girls	1									1
	Total	1									1
omp: Hyper: $\overline{c}$ Astig: Mixed Astig:	Boys.										
	Girls								1		1
	Total								1		1
Total	Boys			1			1				2
"	Girls	2	1	2			1		1		7
	Total	2	1	3			2		1		9

MARGINAL KERATITIS.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hypermetropia	Boys					1					1
	Girls				1						1
	Total				1	1					2
Hyper: Astig: Compound.	Boys						1				1
	Girls						1				1
	Total						2				2
Hyper: $\overline{c}$ Hyper: Astig:	Boys					1					1
	Girls										
	Total					1					1
Myopic Astig: Compound	Boys										
	Girls					1					1
	Total					1					1
Mixed Astig:	Boys								1		1
	Total								1		1
Total	Boys					2	1		1		4
"	Girls				1	1	1				3
	Total				1	3	2		1		7
Keratitis $\overline{c}$ Margin: Keratitis		2	1	3	1	3	4		2		16

MACULAE & NABULAE.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hyper: Astig: Simplex	Boys										
	Girls			1							1
	Total			1							1
Hyper: Astig: Compound	Boys			1	1	1					3
	Girls		1		1			1			3
	Total		1	1	2	1		1			6
Hyper: $\overline{c}$ Hyper: Astig:	Boys										
	Girls	1	1	1						1	4
	Total	1	1	1						1	4
Myopia	Boys										
	Girls					1					1
	Total					1					1
Mixed Astig:	Boys		1								1
	Girls		1						1		2
	Total		2						1		3
Hyper: $\overline{c}$ Mixed Astig:	Boys										
	Girls						1				1
	Total						1				1
Comp: Hyper: Astig: $\overline{c}$ Mixed Astig:	Boys							1			1
	Girls										
	Total							1			1
Myopic Astig: $\overline{c}$ Mixed Astig:	Boys										
	Girls					1					1
	Total					1					1
Total	Boys		1	1	1	1		1			5
"	Girls	1	3	2	1	2	1	1	1	1	13
	Total	1	4	3	2	3	1	2	1	1	18
Keratitis $\overline{c}$ Nabulae.	Total	3	5	6	3	6	5	2	3	1	34

ULCER OF CORNEA.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hyper: Astig: Compound	Boys		1			1				1	3
	Girls		1		1		1				3
	Total		2		1	1	1			1	6
Hypermetropia Retinoscopy Impossible	Boys		1								1
	Girls										
	Total		1								1
Total	Boys		2			1				1	4
"	Girls		1		1		1				3
	Total		3		1	1	1			1	7

ULCER OF CORNEA (LEFT EYE)

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hyper: $\overline{c}$ Hyper: Astig:	Boys	1							1		2
	Girls		1								1
	Total	1	1						1		3

ULCER OF CORNEA (RIGHT EYE.)

Hyper: $\overline{c}$ Hyper: Astig:	Girls.		1								1

CHOROIDAL CHANGES.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hyper: Astig: Compound	Boys						1				1
	Girls										
	Total						1				1
Simple & Comp: Hyper: Astig:	Boys										
	Girls						1				1
	Total						1				1
Myopia	Boys						1				1
	Girls										
	Total						1				1
Myopic Astig: Simplex	Boys		1								1
	Girls								1		1
	Total		1						1		2
Myopic Astig: Compound	Boys		1					1	1	1	4
	Girls			1	2	2		2	1		8
	Total		1	1	2	2		3	2	1	12
Myopic Astig: Simple & Comp:	Boys						2				2
	Girls										
	Total						2				2
Myopia $\bar{c}$ Myopic Astig:	Boys						1	1	1	1	4
	Girls							1			1
	Total						1	2	1	1	5
Mixed Astig:	Boys						1		1		2
	Girls					1	1				2
	Total					1	2		1		4
Myopic Astig: $\bar{c}$ Mixed Astig:	Boys						2		1		3
	Girls						1				1
	Total						3		1		4
Hyper: $\bar{c}$ Myopia	Boys			1							1
	Girls										
	Total			1							1
Total	Boys		2	1			8	2	4	2	19
"	Girls			1	2	3	3	3	2		14
	Total		2	2	3	3	11	5	6	2	33

OPTIC ATROPHY (RIGHT & LEFT EYE)

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hypermetropia	Boys									1	1
	Girls			1							1
	Total			1						1	2
Hyper: Astig: Compound.	Boys					1					1
	Girls										
	Total					1					1
Myopic Astig: Simplex	Boys		1								1
	Girls										
	Total		1								1
Myopic Astig: Compound.	Boys					1					1
	Girls										
	Total					1					1
Mixed Astig:	Boys										
	Girls				1						1
	Total				1						1

CONVERGENT CONCOMITANT STRABISMUS.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hypermetropia	Boys	2				1		1			4
	Girls	3	3	2		1		1	1		11
	Total	5	3	2		2		2	1		15
Hyper: Astig: Simplex	Boys			1							1
	Girls										
	Total			1							1
Hyper: Astig: Compound	Boys	1		1	2	1	6	2			16
	Girls	2	2	1	3	2	3	3			16
	Total	3	2	5	5	3	9	5			32
Hyper: $\overline{c}$ Hyper: Astig:	Boys	3		2			1	2	1		9
	Girls	1		1			1	1			4
	Total	4		3			2	3	1		13
Myopic Astig: Compound	Boys										
	Girls							1			1
	Total							1			1
Comp: Hyper: Astig: c Mixed Astig:	Boys									1	1
	Girls										
	Total									1	1
Myopic Astig: $\overline{c}$ Mixed Astig:	Boys										
	Girls					1					1
	Total					1					1
Hypermetropia c Myopia	Boys			1							1
	Girls										
	Total			1							1
Total	Boys	6		8	2	2	7	5	1	1	32
"	Girls	6	5	4	3	4	4	6	1		33
	Total	12	5	12	5	6	11	11	2	1	65

TREATMENT OF CONVERGENT CONCOMITANT STRABISMUS

$\bar{c}$ Glasses $\bar{c}$ Atropine.

AGES:-		5	6	7	8	9	10	11	12	13	Total.
Hypermetropia	Boys	2						1			3
	Girls	3	2	2		1			1		9
	Total	5	2	2		1		1	1		12
Hyper: Astig: Simplex	Boys			1							1
	Girls										
	Total			1							1
Hyper: Astig: Compound.	Boys	1		2	2	1	5	2			13
	Girls	2	1	1	2	1	2	2			11
	Total	3	1	3	4	2	7	4			24
Hyper: $\bar{c}$ Hyper: Astig:	Boys	3		2			2	2	1		10
	Girls	1		1							2
	Total	4		3			2	2	1		12
Myopic Astig: Compound	Boys										
	Girls							1			1
	Total							1			1
Comp: Hyper: Astig: $\bar{c}$ Mixed Astig:	Boys									1	1
	Girls										
	Total									1	1
Myopic Astig: $\bar{c}$ Mixed Astig:	Boys										
	Girls					1					1
	Total					1					1
Hypermetropia $\bar{c}$ Myopia	Boys			1							1
	Girls										
	Total			1							1
Total	Boys	6		6	2	1	7	5	1	1	29
"	Girls	6	3	4	2	3	2	3	1		24
	Total	12	3	10	4	4	9	8	2	1	53

LEFT INTERNAL STRABISMUS.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hypermetropia	Boys	5	1	1	2				1	2	12
	Girls	1	1	1	1			1	1		6
	Total	6	2	2	3			1	2	2	18
Hyper: Astig: Simplex	Boys			1							1
	Girls										
	Total			1							1
Hyper: Astig: Compound	Boys	5	1		1	1			1		9
	Girls	1		2	2	1	5	1	1		13
	Total	6	1	2	3	2	5	1	2		22
Hyper: $\overline{c}$ Hyper: Astig:	Boys		2		1	1					4
	Girls	1	1	1		1	1				5
	Total	1	3	1	1	2	1				9
Retinoscopy Impossible	Boys		1								1
	Girls										
	Total		1								1
Comp: Hyper: Astig: $\overline{c}$ Mixed Astig:	Boys										
	Girls							1			1
	Total							1			1
Total	Boys	10	5	2	4	2			2	2	27
"	Girls	3	2	4	3	2	6	3	2		25
	Total	13	7	6	7	4	6	3	4	2	52

RIGHT INTERNAL STRABISMUS.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hypermetropia	Boys	2	2		1			1			6
	Girls							1			1
	Total	2	2		1			2			7
Hyper: Astig: Compound.	Boys	2			1		3	1	2	1	10
	Girls		1	3	1		2		1	1	9
	Total	2	1	3	2		5	1	3	2	19
Hyper: $\overline{c}$ Hyper Astig:	Boys						1		1		2
	Girls		1			1				1	3
	Total		1			1	1		1	1	5
Myopic Astig: Compound	Boys										
	Girls							1			1
	Total							1			1
Mixed Astig:	Boys										
	Girls		1								1
	Total		1								1
Simple $\overline{c}$ Comp: Hyper: Astig:	Boys										
	Girls	1									1
	Total	1									1
Total	Boys.	4	2		2		4	2	3	1	18
	Girls	1	3	3	1	1	2	2	1	2	16
	Total	5	5	3	3	1	6	4	4	3	34

TREATMENT OF LEFT INTERNAL STRABISMUS

$\bar{c}$ Glasses $\bar{c}$ Atropine.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hypermetropia	Boys	3	1	1					1	1	7
	Girls		1	1	1				1		4
	Total	3	2	2	1				2	1	11
Hyper: Astig: Compound	Boys	5	1		1				1		8
	Girls			2	1		5	1			9
	Total	5	1	2	2		5	1	1		17
Hyper: Astig: Simplex	Boys			1							1
	Girls										
	Total			1							1
Hyper: $\bar{c}$ Hyper: Astig:	Boys		1								1
	Girls		1	1		1	1				4
	Total		2	1		1	1				5
Comp:Hyper:Astig: $\bar{c}$ Mixed Astig:	Boys										
	Girls							1			1
	Total							1			1
Total	Boys	8	3	2	1				2	1	17
"	Girls		2	4	2	1	6	2	1		18
	Total	8	5	6	3	1	6	2	3	1	35

TREATMENT OF RIGHT INTERNAL STRABISMUS.

$\bar{c}$ Glasses $\bar{c}$ Atropine.

ES:-		5	6	7	8	9	10	11	12	13	Total.
ermetropia	Boys	1						1			2
	Girls										
	Total	1						1			2
per: Astig:	Boys	2			1		2	1	2		8
Compound.	Girls			2	1		1		1	1	6
	Total	2		2	2		3	1	3	1	14
permetropia $\bar{c}$	Boys						1		1		2
per: Astig:	Girls		1							1	2
	Total		1				1		1	1	4
mple $\bar{c}$ Comp:	Boys										
per: Astig:	Girls	1									1
	Total	1									1
Total	Boys	3			1		3	2	3		12
"	Girls	1	1	2	1		1		1	2	9
	Total	4	1	2	2		4	2	4	2	21

TENOTOMY $\overline{C}$ ATROPINE & GLASSES.
Left Internal Rectus.

GES:-		5	6	7	8	9	10	11	12	13	Total.
ypermetropia	Boys	1			1					1	3
	Girls	1				1		1			3
	Total	2			1	1		1		1	6
yper: Astig: Compound	Boys										
	Girls	1				1			1		3
	Total	1				1			1		3
yper: $\overline{c}$ yper: Astig:	Boys		1		1						2
	Girls	1									1
	Total	1	1		1						3
Total	Boys	1	1		2					1	5
"	Girls	3				2		1	1		7
	Total	4	1		2	2		1	1	1	12

RIGHT INTERNAL RECTUS.

GES:-		5	6	7	8	9	10	11	12	13	Total.
ypermetropia	Boys		1								1
	Girls							1			1
	Total		1					1			2
yper: Astig: Compound	Boys						1				1
	Girls		1	1							2
	Total		1	1			1				3
yper: $\overline{c}$ yper: Astig:	Boys										
	Girls					1					1
	Total					1					1
Total	Boys		1				1				2
"	Girls		1	1		1		1			4
	Total		2	1		1	1	1			6

DOUBLE TENOTOMY.

GES:-		5	6	7	8	9	10	11	12	13	Total
yper: Astig: Compound.	Boys			1							1
	Girls				1		1	1			3
	Total			1	1		1	1			4
yper: $\overline{c}$ yper: Astig:	Boys										
	Girls							1			1
	Total							1			1

DIVERGENT STRABISMUS $\overline{C}$ GLASSES.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hyper: Astig: Compound.	Boys	1									1
	Girls		1	1							2
	Total	1	1	1							3
Hyper: $\overline{c}$ Hyper: Astig:	Boys										
	Girls		1					1			2
	Total		1					1			2
	Total	1	2	1				1			5

LEFT DIVERGENT STRABISMUS.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hyper: Astig: Compound	Boys										
	Girls					1					1
	Total					1					1
Myopic Astig:Comp: c Glasses.	Boys										
	Girls					1					1
	Total					1					1
	Total					2					2

RIGHT DIVERGENT STRABISMUS.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Myopia $\overline{c}$ Glasses	Boys										
	Girls					1		1			2
	Total					1		1			2
Myopic Astig: Compound.	Boys										
	Girls								1		1
	Total								1		1
Mixed Astig:	Boys										
	Girls						1				1
	Total						1				1
	Total					1	1	1	1		4

SQUINTED SINCE BIRTH.

Myopic Astig: Simplex.	Boy		1								

AMBLYOPIA. (LEFT EYE)

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hypermetropia	Boys.				1				1	2	4
	Girls			1		2			1		4
	Total			1	1	2			2	2	8
Hyper: Astig: Compound	Boys					1					1
	Girls				1		2	1			4
	Total				1	1	2	1			5
Hyper: $\overline{c}$ Hyper: Astig:	Boys					2					2
	Girls										
	Total					2					2
	Total			1	2	5	2	1	2	2	15

AMBLYOPIA (RIGHT EYE)

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hypermetropia	Boys							2			2
	Girls		1					1	1		3
	Total		1					3	1		5
Hyper: Astig: Compound	Boys				1		1		2		4
	Girls			1	1						2
	Total			1	2		1		2		6
Hyper: $\overline{c}$ Hyper: Astig:	Boys										
	Girls				1						1
	Total				1						1
Simple $\overline{c}$ Comp: Hyper: Astig:	Boys										
	Girls						1				1
	Total						1				1
Comp: $\frac{}{c}$ Hyper: Astig: Mixed Astig:	Boys										
	Girls							1			1
	Total							1			1
	Total		1	1	3		2	4	3		14

PAIN IN HEAD.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hypermetropia	Boys					1	2				3
	Girls	1				1	1		2	2	7
	Total	1				2	3		2	2	10
Hyper: Astig: Simplex	Boys						1				1
	Girls				1						1
	Total				1		1				2
Hyper: Astig: Compound	Boys					1			1		2
	Girls					1	2	2	1	1	7
	Total					2	2	2	2	1	9
Hypermetropia $\overline{c}$ Hyper: Astig:	Boys	1			1			1			3
	Girls						2	4			6
	Total	1			1		2	5			9
Myopic Astig: Simplex	Boys										
	Girls					1					1
	Total					1					1
Simple Hyper: Astig: c Mixed Astig:	Boys									1	1
	Girls										
	Total									1	1
	Total	2			2	5	8	7	4	4	32

PAIN IN EYES.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hypermetropia	Boys		1								1
	Girls			1		2	1				4
	Total		1	1		2	1				5
Hyper: Astig: Compound.	Boys						1				1
	Girls								1		1
	Total						1		1		2
Hyper: $\overline{c}$ Hyper: Astig:	Boys										
	Girls		1								1
	Total		1								1
	Total		2	1		2	2		1		8

NYSTAGMUS.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hyper: Astig: Compound	Boys								1		1
	Girls				1						1
	Total				1				1		2
Myopia	Boys							1			1
	Girls										
	Total							1			1
Myopic Astig: Compoind.	Boys					1					1
	Girls										
	Total					1					1
Mixed Astig:	Boys		1	1							2
	Girls				1						1
	Total		1	1	1						3
	Total		1	1	2	1		1	1		7

CONGESTED DISCS.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hyper: Astig: Compound	Boys			1							1
	Girls		1	1			1				3
	Total		1	2			1				4
Simple $\bar{c}$ Comp: Hyper: Astig:	Boys				1						1
	Girls										
	Total				1						1
Myopic Astig: Compound	Boys			2							2
	Girls						1				1
	Total			2			1				3
	Total		1	4	1		2				8

A P P E N D I X 8.

(GROUP 2)

THE SUB-GROUPS IN WHICH SPASM OF ACCOMMODATION OCCURS, AND THE AGE OF PATIENT.

SPASM OF ACCOMMODATION.

AGES:-		5	6	7	8	9	10	11	12	13	Total
Hypermetropia	Boys.	1	1	1	4	4	1	2	1	1	16
	Girls				1	1	3	2	7	2	16
	Total.	1	1	1	5	5	4	4	8	3	32
Hyper: Astig: Compound.	Boys.			3		3	3	4		1	14
	Girls.		1		1	7	6	6	3	1	25
	Total		1	3	1	10	9	10	3	2	39
Hyper: $\overline{c}$ Hyper: Astig:	Boys	1		1	1		1	3			7
	Girls					1	5	5	2		13
	Total	1		1	1	1	6	8	2		20
Hyper: $\overline{c}$ Myopia.	Boys.			1							1
	Girls.					1					1
	Total			1		1					2
Myopia.	Boys.				1	1	1				3
	Girls.			1	2					1	4
	Total			1	3	1	1			1	7
Myopic Astig: Compound.	Boys.					1			1		2
	Girls.						1				1
	Total					1	1		1		3
Mixed Astigmatism.	Boys.								1		1
	Girls.									1	1
	Total.								1	1	2
Hyper: $\overline{c}$ Mixed Astig:	Boys.										
	Girls					1					1
	Total					1					1
Normal	Boys.					1					1
	Girls.			1					1	1	3
	Total.			1		1			1	1	4
Totals.	Boys.	2	1	6	6	10	6	9	3	2	45
	Girls.		1	2	4	11	15	13	13	6	65
	Total.	2	2	8	10	21	21	22	16	8	110

A P P E N D I X 9.

(GROUP 3)

CASES IN WHICH ATROPINE WAS USED BUT NO RETINOSCOPY DONE.

CASES IN WHICH ATROPINE WAS USED AND NO RETINOSCOPY DONE.

Ages:-		5	6	7	8	9	10	11	12	13	Total.
Ulcer of Cornea.	Boys.		1								1
(Retinoscopy	Girls.										
Impossible.)	Total.		1								1
Congenital	Boys.		1	1							2
Cataract.	Girls.			1							1
(Extraction of both.)	Total.		1	2							3
Keratitis c Choroiditis Pigmentosa c Nystagmus.	Boys.										
	Girls.						1				1
	Total.						1				1
Glioma c Enucleation. (Left eye.)	Boys.										
	Girls.				1						1
	Total.				1						1
Cerebral Tumour Optic Neuritis.	Boys.		1					1			2
	Girls.										
	Total.		1					1			2
Hydrocephalous. Secondary to Basic Meningitis.	Boys.										
	Girls.		1								1
	Total.		1								1
Atropine by mistake.	Boys.					1					1
	Girls.					1					1
	Total.					2					2

Total.

Boys.	6
Girls.	5
Total.	11

A P P E N D I X 10.

LIST OF GLASSES PRESCRIBED WITH PRICE CHARGED BY THE FIRM WHICH SUPPLIES THEM TO THE PATIENTS.

OUT OF THE 1041 CASES I ANALYSED 627 RECEIVED GLASSES. THE FOLLOWING IS THE RECORD OF KIND & PRICE.

	No.	Price	Total Amt: £	s	d
+ Sphericals - - -	289	2/6	36	2	6
— Sphericals - - -	55	2/6	6	17	6
+ Cylinders. - - -	70	5/6	19	5	0
— Cylinders. - - -	27	5/6	7	8	6
+ Sphericals c̄ Cylinders. - -	60	7/6	22	10	0
— Sphericals c̄ Cylinders. - -	17	7/6	6	7	6
+ Sphericals in one eye & + Sphero-Cylinders in the other. - -	25	5/6	6	17	6
— Sphericals in one eye & — Sphero-Cylinders in the other. - -	14	5/6	3	17	0
+ Sphero-Cylinder in one eye & + Cylinder in the other. - -	14	6/-	4	4	0
— Sphero-Cylinder in one eye & — Cylinder in the other. - -	8	6/-	2	8	0
+ Sphero-Cylinder in one eye & — Sphero c̄ + Cylinder in the other. -	1	7/6		7	6
— Sphero-Cylinder in one eye & + Sphero c̄ — Cylinder in the other. -	2	7/6		15	0
+ Sphero-Cylinder in one eye & + Sphero c̄ — Cylinder in the other.	1	7/6		7	6
+ Spherical c̄ — Cylinder - -	21	4/6	4	14	6
— Spherical c̄ + Cylinder - -	5	4/6	1	2	6
+ Cylinder in one eye & — Spherical c̄ + Cylinder in the other. - -	3	6/-		18	0
+ Cylinder in one eye & + Spherical c̄ — Cylinder in the other. - -	4	6/-	1	4	0
— Cylinder in one eye & + Spherical c̄ — Cylinder in the other.	4	6/-	1	4	0
	620		£126	10	6

Continued.

	No	Price.	£	s	d
Forward.	620		126	10	6
+ Spherical in one eye & — Sphero-Cylinder in the other. - -	1	5/6		5	6
+ Spherical in one eye & — Cylinder in the other. - -	2	4/6		9	0
— Spherical in one eye & + Cylinder in the other. - -	1	4/6		4	6
+ Cylinder in one eye & — Cylinder in the other. - -	1	5/6		5	6
+ Cylinder in one eye & Plane in the other.	1	3/6		3	6
— Cylinder in one eye & Plane in the other.	1	3/6		3	6
Total.	627		£ 128	2	0

A P P E N D I X 11 .

CASES SHOWING THE ADVANTAGE OF BOTH EYES BEING EXAMINED SEPARATELY.

CASES SHOWING THE ADVANTAGE OF EYES BEING EXAMINED SEPARATELY AND ILLUSTRATING THE FACT THAT VERY MANY CASES HAVE CONSIDERABLE UNEQUAL VISION.

	Visual Acuity.		Glasses recommended.		Visual Acuity Last Visit.	
	Right Eye	Left Eye	Right Eye	Left Eye	Right Eye	Left Eye.
Case 1.	Fingers at 2 metres c $\frac{6}{36}$ +4D	$\frac{6}{5}$ No M.H.	+3.5	+1.5		
Case 15.	$\frac{6}{24}$	$\frac{6}{12}$	+1D	+1D		
Case 23.	$\frac{6}{24}$	$\frac{6}{12}$	+1.5 Cyl.	+2 Cyl.		
Case 50.	$\frac{5}{24}$	$\frac{5}{12}$	+2 Cyl.	$\overline{C}$.+2 Cyl.	$\frac{5}{12}$	$\frac{5}{12}$
Case 71.	$\frac{6}{36}$	$\frac{6}{9}$	+1.5 Sph. +2.5 Cyl. axis. Vertical	+1 Sph. +1 Cyl. axis. Vertical.	$\frac{6}{12}$	$\frac{6}{9}$
Case 94.	$\frac{6}{18}$	$\frac{6}{36}$	+1.5 Sph. +.5 Cyl.	+1 Sph. +1.5 Cyl.		
Case 108.	$\frac{6}{9}$	$\frac{6}{36}$	+1.5	+2.5		
Case 110.	$\frac{6}{36}$	$\frac{6}{9}$				
Case 120.	$\frac{6}{12}$	$\frac{6}{9}$	$\overline{C}$ - 0.5	-1	$\frac{6}{9}$	$\frac{6}{5}$
Case 140.	$\frac{6}{12}$	$\frac{6}{24}$	+1.5	+1.25 +1 Cyl. axis 100.	$\frac{6}{6}$	$\frac{6}{6}$
Case 168.	$\frac{6}{12}$	$\frac{6}{24}$	+0.75 +0.75 axis 100	+1 +1.5 axis 80.	$\frac{6}{6}$	$\frac{6}{9}$

	Visual Acuity.		Glasses Recommended		Visual Acuity Last Visit.	
	Right Eye	Left Eye	Right Eye	Left Eye	Right Eye	Left Eye.
Case 185.	6/24	6/9	+3 Cyl. axis 60.	+.5 Sph. / +.75 axis 60.	6/12	6/6
Case 196.	6/12	6/9	−.75 Cyl. axis 145	−.75 axis 145.		
Case 198.	6/12	6/9	+.75	+.75		
Case 202.	6/9	6/6	+ 1	+1	6/6	6/5
Case 204.	6/24	6/9				
Case 221.	6/12	6/36	+1 / +1.5 Cyl.	+2 Sph. / −3.5 Cyl.	6/12	6/12
Case 260.	6/9	6/24	+.5 Cyl. axis 120	+2.5 Cyl. axis 120	6/9	6/12
Case 268.	5/24	5/12	+1.5 Cyl. axis 65.	+1.5 Cyl. axis 65.	5/9	5/9
Case 270.	6/9	6/12	+2.5	+2.5	6/9	6/9
Case 280.	5/12	5/18	+1.25 Cyl. axis vertical.	+0.75 Cyl. axis vertical.	5/12	5/9
Case 343.	6/12	6/24	+.5 Sph. / +1.5 Cyl. axis 70	+.5 Sph. / +2 Cyl. axis 70.	6/9	6/9
Case 372.	6/18	6/6	+1 Cyl. Vertical.	+.5 Cyl. Vertical.	6/5	6/5
Case 382.	5/5	5/9				
Case 383.	6/9	6/6	$\overline{c}$ +1	$\overline{c}$ +1	6/5	6/5

	Visual Acuity.		Glasses Recommended.		Visual Acuity Last Visit.	
	Right Eye	Left Eye	Right Eye	Left Eye	Right Eye	Left Eye
se 388.	$\frac{6}{9}$	$\frac{6}{12}$	+ .75	+ .75		
se 392.	$\frac{6}{6}$	$\frac{6}{9}$				
se 419	$\frac{6}{9}$	$\frac{6}{24}$				
se 424	$\frac{6}{9}$	$\frac{6}{36}$	+ 1.5	+ 1.5	$\frac{6}{6}$	$\frac{6}{6}$
se 430	$\frac{6}{24}$	$\frac{6}{12}$	− 0.5 Cyl.	− 1 Cyl.	$\frac{6}{9}$	$\frac{6}{9}$
se 432	$\frac{6}{12}$	$\frac{6}{9}$	+ 0.75	+ 0.5	$\frac{6}{6}$	$\frac{6}{6}$
se 446	$\frac{6}{60}$ + 1.5 = $\frac{6}{12}$	$\frac{6}{12}$ M.H. + 1D				
se 452	$\frac{6}{24}$	$\frac{6}{9}$	− 3 Sph. − 3 Cyl. axis Horiz:	− 1 Cyl. axis Horiz:	$\frac{6}{12}$	$\frac{6}{9}$
se 456	$\frac{6}{18}$	$\frac{6}{12}$	+ 1.5	+ 0.5	$\frac{6}{6}$	$\frac{6}{6}$
se 464	$\frac{6}{18}$	$\frac{6}{9}$				
se 485	$\frac{6}{18}$	$\frac{6}{9}$	+ 1 Cyl. Vertical	+ 1 Cyl. Vertical	$\frac{6}{12}$	$\frac{6}{9}$
se 502	$\frac{6}{24}$	$\frac{6}{9}$	+ 1.5	+ 1	$\frac{6}{18}$	$\frac{6}{9}$
se 504	$\frac{6}{5}$	$\frac{6}{36}$	$\bar{c}$ + 2	$\bar{c}$ + 2	$\frac{6}{5}$	$\frac{6}{9}$

	Visual Acuity.		Glasses Recommended.		Visual Acuity Last Visit.	
	Right Eye	Left Eye	Right Eye	Left Eye	Right Eye	Left Eye
Case 533	6/36	6/12	+3 Sph. / −3.5 Cyl.	+.5 / +1.5	6/12	6/9
Case 534	6/36	6/12	−3.5 Cyl.	−3.5 Cyl.	6/18	6/9
Case 537	6/5	6/9				
Case 540	6/12	6/24	+2 Cyl.	+3 Sph. / −4 Cyl.	6/9	6/9
Case 570	6/12	6/9	$\bar{C}$ +1	$\bar{C}$ +1	6/6	6/5
Case 584	6/24	6/12	$\bar{c}$ +3 Cyl.	$\bar{c}$ +1 Sph. / +1.5 Cyl.	6/12	6/9
Case 591	6/12	6/18	$\bar{c}$ +1.5	+.75 / +1.5 Cyl.	6/9	6/9
Case 612	6/18	6/12				
Case 633	6/24	6/12	$\bar{C}$ +1.5	$\bar{C}$ +1.5	6/6	6/6
Case 643	5/12	5/9	$\bar{C}$+ 1.5	+1.5	5/5	5/5
Case 681	6/6	6/18	+1.5	+1.5		
Case 684	6/12	6/18	+1.5 Cyl. Vertical.	+2 Cyl.	6/9	6/9
Case 691	6/18	6/24	−0.5 Cyl.	−1.5 Cyl.	6/9	6/9

	Visual Acuity		Glasses Recommended.		Visual Acuity Last Visit.	
	Right Eye	Left Eye	Right Eye	Left Eye	Right Eye	Left Eye
Case 707	$\frac{6}{6}$	$\frac{6}{12}$				
Case 719	$\frac{6}{9}$	$\frac{6}{6}$	+1	+1		
Case 730	$\frac{6}{18}$	$\frac{6}{12}$	$\bar{C}$ +.75	+.75	$\frac{6}{9}$	$\frac{6}{9}$
Case 732	$\frac{6}{12}$	$\frac{6}{18}$				
Case 740	$\frac{6}{9}$	$\frac{6}{12}$				
Case 744	$\frac{6}{9}$	$\frac{6}{18}$				
Case 752	$\frac{5}{12}$	$\frac{5}{24}$	+2	+2	$\frac{5}{5}$	$\frac{5}{5}$
Case 757	$\frac{6}{12}$	$\frac{6}{18}$	+.75	+.75		
Case 769	$\frac{5}{9}$	$\frac{5}{6}$	+1	+1	$\frac{5}{6}$	$\frac{5}{5}$
Case 772	$\frac{6}{6}$	$\frac{6}{24}$	No improvement	−1 Cyl.		$\frac{6}{6}$
Case 775	$\frac{6}{18}$	$\frac{6}{12}$	+1.5 Cyl.	+1.5 Cyl.	$\frac{6}{9}$	$\frac{6}{9}$
Case 777	$\frac{6}{9}$	$\frac{6}{12}$	−.75 Cyl.	−.75		
Case 783	$\frac{5}{12}$	$\frac{5}{6}$	$\bar{c}$ +1	No imp:	$\frac{5}{9}$	

	Visual Acuity.		Glasses Recommended.		Visual Acuity Last Visit.	
	Right Eye	Left Eye	Right Eye	Left Eye	Right EyE	Left Eye
Case 784	$\frac{6}{9}$	$\frac{6}{18}$	+0.75	+2 Cyl. Vertical.	$\frac{6}{6}$	$\frac{6}{9}$
Case 816	$\frac{6}{6}$	$\frac{6}{9}$		$\frac{6}{9}$ +0.5		$\frac{6}{6}$
Case 825	$\frac{6}{18}$	$\frac{6}{24}$	+ 2 / + 1 H.	+ 2 / + 2.5	$\frac{6}{9}$	$\frac{6}{9}$
Case 839	$\frac{6}{18}$	$\frac{6}{12}$	+.5	Plane.		
Case 847	$\frac{6}{9}$	$\frac{6}{12}$	+1 Cyl.	+ 2.5 Cyl.	$\frac{6}{6}$	$\frac{6}{9}$
Case 856	$\frac{6}{12}$	$\frac{6}{9}$	+.75	+.75	$\frac{6}{5}$	$\frac{6}{5}$
Case 866	$\frac{6}{9}$	$\frac{6}{6}$	$\bar{c}$ +1	$\bar{c}$ +1	$\frac{6}{6}$	$\frac{6}{6}$
Case 873	$\frac{6}{18}$	$\frac{6}{12}$	− 1	− 1	$\frac{6}{6}$	$\frac{6}{6}$
Case 893	$\frac{6}{24}$	$\frac{6}{18}$	+2.5 Cyl. axis 60	+2 Cyl. axis 60.		
Case 903	$\frac{6}{24}$	$\frac{6}{12}$	−.25 / − .5 Cyl.	−.5 Cyl.	$\frac{6}{9}$	$\frac{6}{9}$
Case 905	$\frac{5}{12}$	$\frac{5}{9}$	+1 Sph.	+ 1.5		
Case 913	$\frac{6}{18}$	$\frac{6}{12}$	+1 Sph. / +1.5 Cyl.	+ 1.5 / +1.5 Cyl.	$\frac{6}{6}$	$\frac{6}{6}$
Case 916	$\frac{5}{36}$	$\frac{5}{12}$				
Case 924	$\frac{6}{18}$	$\frac{6}{9}$	+1	+1	$\frac{6}{9}$	$\frac{6}{6}$

	Visual Acuity.		Glasses Recommended.		Visual Acuity Last Visit.	
	Right Eye	Left Eye	Right Eye	Left Eye	Right Eye	Left Eye
Case 941	$\frac{6}{12}$	$\frac{6}{9}$	− 1D	− 1D		
Case 943	$\frac{5}{0}$	$\frac{5}{9}$	− 3.5 / − 4.5 Cyl.	− 2.5	$\frac{6}{12}$	$\frac{6}{9}$
Case 974	$\frac{5}{18}$	$\frac{5}{12}$	− 1.5	− 0.5 / − 0.5	$\frac{6}{6}$	$\frac{6}{6}$
Case 983	$\frac{6}{6}$	$\frac{6}{12}$	+ 2	+ 2.5		
Case 1007	$\frac{5}{9}$	$\frac{5}{12}$	+3.5	+ 4		
Case 1011	$\frac{6}{12}$	$\frac{6}{9}$	+ 3.5	+ 3.5	$\frac{6}{6}$	$\frac{6}{6}$
Case 1012	$\frac{5}{9}$	$\frac{5}{18}$	+0.75	+ 1		
Case 1014	$\frac{6}{12}$	$\frac{6}{24}$	+ 2	+ 2		
Case 1022	$\frac{6}{6}$	$\frac{6}{9}$	+ 1.5	+ 1.5		
Case 1027	$\frac{6}{9}$	$\frac{6}{5}$				
Case 1049	$\frac{6}{12}$	$\frac{6}{36}$	− 1 Cyl. axis 160	− 0.5 / − 0.5 Cyl.	$\frac{6}{6}$	$\frac{6}{6}$
Case 1055	$\frac{6}{6}$	$\frac{6}{12}$	+ 2	+ 2.5		
Case 1056	$\frac{6}{9}$	$\frac{6}{6}$				