

STRABISMUS CONVERGENS

with

special reference

to

Central Scotoma

THESIS for M.D. WILLIAM ROBERTSON.

ProQuest Number:27626623

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.



ProQuest 27626623

Published by ProQuest LLC (2019). Copyright of the Dissertation is held by the Author.

All rights reserved.

This work is protected against unauthorized copying under Title 17, United States Code
Microform Edition © ProQuest LLC.

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 – 1346

PART. I.

Contains a short resumé of the subject of Strabismus
Convergens. In looking up the literature continual
reference was made to Donders, Landolt and Schweigger
on Squint. Very little independent has been written
on Strabismus so I have confined any references to
the above named authors.

In describing the operation of tenotomy I have
made use of Lucas' Book on Squint, this surgeon claims
to be the first who performed tenotomy of the internal
Rectus for Strabismus.

PART. II.

The clinical portion of this essay. In every case
when vision was not normal $\frac{6}{6}$ No. I. J. a chart of

vision has been taken.

In the case of central scotoma considerable difficulty was experienced in getting a point of fixation for the amblyopia eye, Blexis', Priestly Smith's and Badal's had to be given up. The hand perimeter of Dr. T. Reid was the one used for all the fields of vision recorded in this pamphlet. The great advantage of this perimeter is that the surgeon's eye is the point of fixation; so that any deviation of the patient's eye can at once be detected and the field begun over again.

The scotomata mapped out are qualitatively correct, many of the fields of vision being verified by a second chart being taken. As the scotoma was negative the patient had a good deal of difficulty in knowing when the discs disappear out of sight. In only one case was the scotoma lessened by operation and proper glasses to correct the ametropia; we will reserve this for its proper place in the second part.

Strabismus Convergens.

Is the condition when the axes of the eyes are

not parallel, the axis of one eye being more converged to the nasal side.

The causes which give rise to this peculiarity were considered in the past to be many in /'Lucas on the cure of Squinting published 1840' / Squint essentially depends on the perverted action of one or more of the muscles; or external violence to distant parts and to the part in the immediate vicinity of the orbits. Strabismus constantly follows exanthematous diseases especially measles from the conjunctiva and retina being more or less engaged in these affections as is evidenced by the suffused and watery eye and the morbid sensibility to light.

The popular mind is still under the impression that squint is produced by the above named causes; and we are bound to believe the statement that a child which did not squint before an attack of measles. The explanation of the appearance of the squint at this time

being simple that the ocular muscles being weakened the child in endeavouring to see clearly will bring more effort to bear on the ocular muscles, hence the squint develops at this period.

But what appears to be the true cause /or one of the causes/ was explained by Donders, 'Experience in the first place shows that strabismus convergens is, in the great majority of cases combined with Hypermetropia'. It is evident how much Hypermetropia preponderates.

In general it is not the highest degrees of H. with which strabismus is combined as will be shown with reference to the synopsis of my cases further on.

We find in those cases which are brought to us to be mostly cases of children, in infants the eye is almost always hypermetropic, and in all cases it can be proved that Hypermetropia was present before the squint took place.

Valk /Errors of Refraction/ page 63.

gives as the causes of Strabismus Convergens,

1. Congenital Amblyopia.
2. Relative Hypermetropia with or without amblyopia or amblyopia ex anopsia.

Hartridge, /Errors of Refraction/ 183

Lays stress on the fact that an amblyopia exists in the affected eye - 'possibly the convergence of the deviating eye is increased by the desire that the weaker image may still be weaker and fall on a more peripheral part of the retina.'

WALK is more emphatic in attributing the squint to the amblyopia. 'At first they will not have the squint constantly but it will always be observed when the child looks at a near object. In many cases of squint with Hypermetropia, in which we find one eye very amblyopic, that probably there is either a deficiency of the retinal elements in that eye or a non-development of the retina this is usually of congenital origin, I believe, and not from non-use as is supposed.'

In Hypermetropia there is often an appearance of strabismus which is caused by the macula being further

from the papilla.

Donders investigations seems to indicate that in such eyes is further from the temporal border of the papilla, than it is in either emmetropia or myopic eyes, from the fact established by Donders it results that the corneal axis of hypermetropic eyes, always converge relatively to the visual lines, and that the former are in absolute divergence when the latter are parallel with each other.

There is a distinct relation between the convergence and accommodation in bringing about strabismus. In the hypermetropic eye when the accommodation is at rest vision is not distinct neither for distance or near work.

When the hypermetrope wants to see clearly even for distance he has to call into play some of his accommodation, which will bring into play some convergence; and for objects near at hand more accommodation and convergence and the eye becomes tired when keeping up such a strain, one eye converges more for rest and if there is any congenital weakness, the eye which is affected gives

way first. If vision is normal in both eyes and one eye converges a diplopia results and the instinctive desire for sharp vision the eye will converge more, so as to bring the image on a peripheral part of the retina and if this goes on for a length of time it brings about an amblyopia = amblyopia ex anopsia.

Landolt /p. 354/ 'We know that the two functions are associated in such a way that, for a given degree of convergence there is always a nearly equal degree of accommodation and vice versa. Now the emmetrope always calls into play as many dioptries of accommodation as the distance of the object requires metre angles of convergence the hypermetrope is obliged to draw on his accommodation; over and above this amount, for a number of dioptries equal to the degree of his ametropia: so long as this degree does not surpass the positive quota of his relative range of accommodation.

The quota by which he can increase his accommodation without varying his convergence, binocular vision is possible. But when the hypermetropia exceeds certain

limits, it is no longer possible to harmonise the two functions that preside over binocular and distinct vision.'

The above extract explains clearly how in looking at near objects for any length of time the accommodation being excessive, that distinct binocular vision is unable to be maintained; so rather to have indistinct binocular vision one eye becomes more convergent and distinct monocular vision is maintained without any effort: and the image on the other eye is suppressed. And this takes place more easily in the eye, if there is any inferiority in vision and is consequently less value in binocular vision.

Hypermetropia in Squint

Schweigger p. 19.

	H ? to	1.0 ^d	30	Permanent
	H.1.0 to	1.50 ^d	23	
1	H 1.50 ^d to	2.0 ^d	41.	
	H 2.0 ^d to	3.0 ^d	58..	
	H 3.0 ^d to	4.50 ^d	35	
	H 5.0 ^d	and more	9.	
				Periodeci
	H ? to	1.0 ^d	8.	
	H.1.0 to	1.50 ^d	14	
2	H.1.50 ^d to	2.0 ^d	20	
	H.2.0 ^d to	3.0 ^d	30	
	H 3.0 ^d to	4.50 ^d	19	
	H 5.0 ^d	and more	7	

I have excluded those squints which were due to Myopia and Emmetropia from the above table but give them below.

Convergent Strabismus

Permanent

1	Myopia	44.
	Emmetropia	<u>85.</u>
		<u>325</u>

Periodic

2	Myopia	10
	Emmetropia	<u>13.</u>
		<u>121.</u>

'According to this percentage of the Hypermetropia /including the doubtful cases/ amounts to 66 per cent. Dr. Isler gives the percentage to Hypermetropia 88 per cent. 'One can assert, with far greater right, that a sufficient ground for squint is not given by slight degrees of Hypermetropia, for the latter are accommodatively overcome and binocular fixation retained by youthful persons without any difficulty.

Table I.

Donders 299 300

Persone	Sex	Age	Eye	Hm.	V.A.	Deviation.
1	M.	23	O D O S	1/10 1/28	0.2 0.67	Str. C. O D
2	M.	15	O D O S	1/12 1/12	1. 0.28	Str. C. O S
3	F.	25	O D O S	? 1/40	0.1 0.85	Str. C. O D
4	M.		O D O S	? 1/28	0.01 0.45	Str. C. O D
5	F.	23	O D O S	in H ? 1/20	0.2 0.5	Str. C. O D
6	M.	12	O D O S	? ?	0.4 0.25	Str. C. Alt.
7	M.	19	O D O S	1/12 1/16	0.66 1.	Str. C. Alt.
8	M.	22	O D O S	1/16 1/11	1 0.41	Str. C. O S
9	F.	18	O D O S	1/20 1/24	0.025 0.4	Str. C. O D
10	F.	16	O D O S	1/18 1/16	1. 1.	Str. C. Alt.

Table II.

Hypermetropia only given from this table.

1	0 D 0 S	Hm. 1/26 1/28	2	0 D 0 S	Hm. 1/12 1/12
3	0 D 0 S	Hm. 1/12 1/12	4	0 D 0 S	Hm. 1/28 1/26
5	0 D 0 S	Hm. 1/36 1/36	6	0 D 0 S	Hm. 1/12 1/12
7	0 D 0 S	Hm. 1/16 1/20	8	0 D 0 S	Hm. 1/6 1/6
9	0 D 0 S	Hm. 1/24 1/20	10	0 D 0 S	Hm. 1/24 1/24
11	0 D 0 S	Hm. 1/10 1/10			

'In the highest degrees of H. strabismus is rarely observed. This need not surprise us. In such cases the power of accommodation is even, under abnormally increased convergence, not sufficient to produce accurate images, and such hypermetropies are thus led rather to the practice of forming correct ideas from imperfect retinal images than by a maximum of tension, improving the retinal images as much as possible. We have already seen that strabismus is met with chiefly in mean degrees.

Amblyopia present in Strabismus Convergens

Schweigger 18.

Permanent

81 Cases.

Visual acuteness more than $1/7$ in 44 cases.

V less than $1/7$ V. = $1/12$ 6 cases.

V less than $1/12$ V. = $1/36$ 20 cases.

Convergent Squint 13 Cases.

Visual acuteness more than $1/7$ 9 cases.

V. \leftarrow $1/7$ to V. = $1/12$ 2.

V. \leftarrow $1/12$ to V. = $1/36$ 1.

From the above tables it is clear that amblyopia is present in a majority of cases of strabismus.

The age at which squint generally appears /Donders/ 5 - 12, but we have well marked cases of strabismus in children of 2 or 3 years which disappears under atropine. But from 7 or upwards it is very rare for squint to appear either from Hypermetropia or from congenital Amblyopia.

Spontaneous cure of squint is not so rare as is thought when the degree of Hypermetropia is low, /Hart-ridge/ and when the vision in the affected eye is normal. In our experience we have only noticed the spontaneous cure of squint when in the squinting eye the amblyopia was great.

It is very common at the clinic of Glasgow Eye

Infirmary for young men to present themselves for an amblyopia which only has been detected when they were examined for their vision prior to admission to the Army, the dot test and failed in the test. When examined no opacity in the media or disease in the fundus of the eye. refraction about 2.0 to 4.0^d H., when questioned they admit having a squint in childhood which no attention was paid to, and they say got well of itself. The following case will illustrate.

D. F. 21 Baker,

Had been testing each eye singly when he found out, one eye was blind could not see the largest print when patient came to me, on examination no disease was present.

V, A.

R. under 6/60 could not count fingers L. 6/12 No. 2 High degree of H. Astig which on correction with proper glasses improves vision of L. to 6/8 No. 1.

The patient thought he had heard his mother speak of a squint when he was a child.

The only operation which we need to consider for the cure of squint is tenotomy and this operation is practically the same as was done by Mr. Lucas, who claimed to be the first surgeon who performed it, in 1840. Lucas 69.

'The patient being thus prepared, and the eye-lids held apart, the operator commences to make the required section of the conjunctiva. In some of my early operations I accomplished this purpose with a pair of forceps and a narrow bladed, sharp-pointed knife, but further experience has shown that it can be better and more quickly performed by means of the sharp-pointed hook and a common pair of scissors than by any other instruments.

The forceps is apt to let go its hold of the conjunctiva.

The operator takes the hook in his right hand and inserts it into the tunica conjunctiva, about 3 lines or two lines and a half distant from the cornea, and on a line corresponding to its transverse axis. He then transfers the hook to his left, and taking in his right

hand the sharp-pointed scissors, he makes a semi-circular incision of this membrane from below upwards upon the outer side of the hook to an extent varying from four to six lines.

When the required section of the conjunctiva is made, the operator takes a blunt hook in his right hand, and inserting it between the edges of the divided conjunctiva, he insinuates it from below upwards, between the tendon of the muscle and the sclerotica. The blunt hook being inserted beneath the muscle the operator transfers it to his left hand, and having brought the tendon into view he divides it, with a pair of sharp-pointed scissors held in his right hand, as close to the insertion as is compatible with the safety of the sclerotica.

The operation done now is the same as described in the extract from Lucas.

In operating there is one modification which I have adopted, making two incisions in the conjunctiva, the one above and one below in line with the muscle. From the top incision the hook is passed in below the

muscle, from the lower incision the blunt-pointed scissors are introduced and the muscle divided, thus leaving a bridge of conjunctiva, not disturbing the semi-lunar fold or caruncle.

In making one incision only across the muscle, as is the usual practice, we often disturb the semi-lunar fold giving the eye an unnatural appearance.

In doing this operation the greater the degree of amblyopia the section of muscles requires to be the freer; less amblyopia where the eye is able to fix the section does not require to be so free. Also in high degree of Hypermetropia, when no amblyopia is present, the section ought to be freer than in low degree of Hypermetropia without amblyopia. In some cases of Strabismus convergens of a low degree of H. with vision 6/6 in each eye a diplopia is apt to be induced which will disappear in time.

The only danger of the operation is when the internal rectus is freely divided sometimes a strabismus divergens is apt to be brought on as will be shown from the

following case.

Mrs. S. 62 Housekeeper

Extreme strabismus divergens in R.

V. A. L. R.

6/9 under 6/60

with proper glasses No. 2

Her R. eye was operated many years ago 'by a surgeon for a squint,' Strabismus Convergens.

After the operation it is common to see the eye a little out, but, after the muscle has formed a new adhesion with the sclerotic and proper glasses ordered, the axis becomes parallel with the good eye.

Mrs. Provan 39

15/7/90

Strabismus Convergens in L.

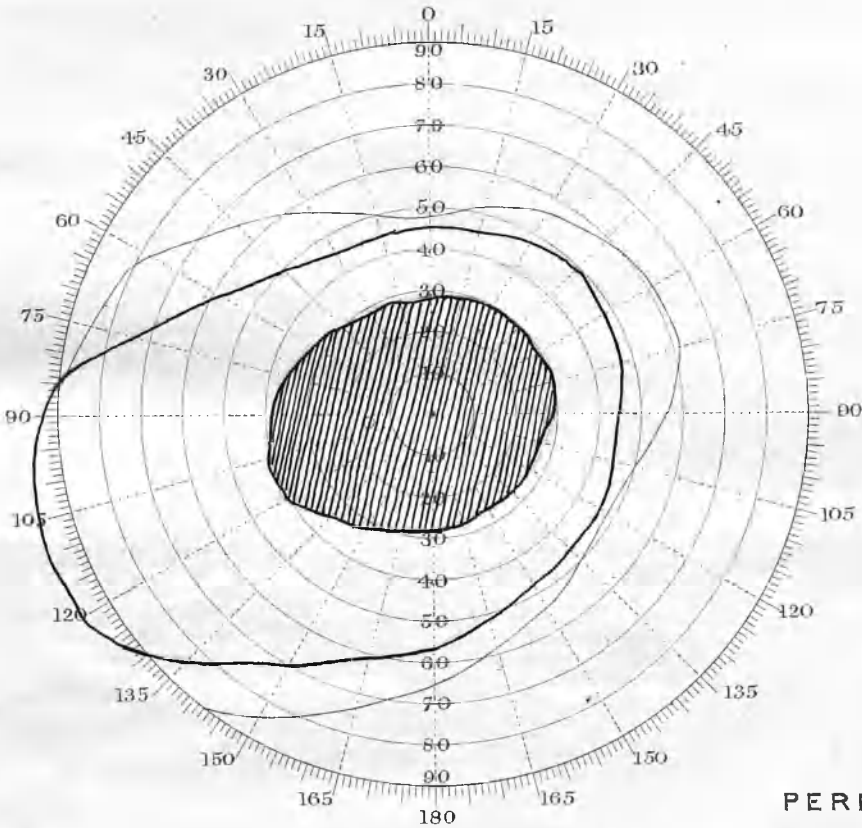
V. A. R. = R. No. 1

L. = No. 20

Refraction + 8° 0^D

Centre each chart with pointer at Zero before LEFT.

L



The eccentric continuous red line indicates the average normal Field. Designed for use with Prof. McHardy's Registering Perimeter.

Lizzie McFeat 19

Oct. 1888

Strabismus Convergens in R.

V. A. R. = No. 20

L. = No. 1

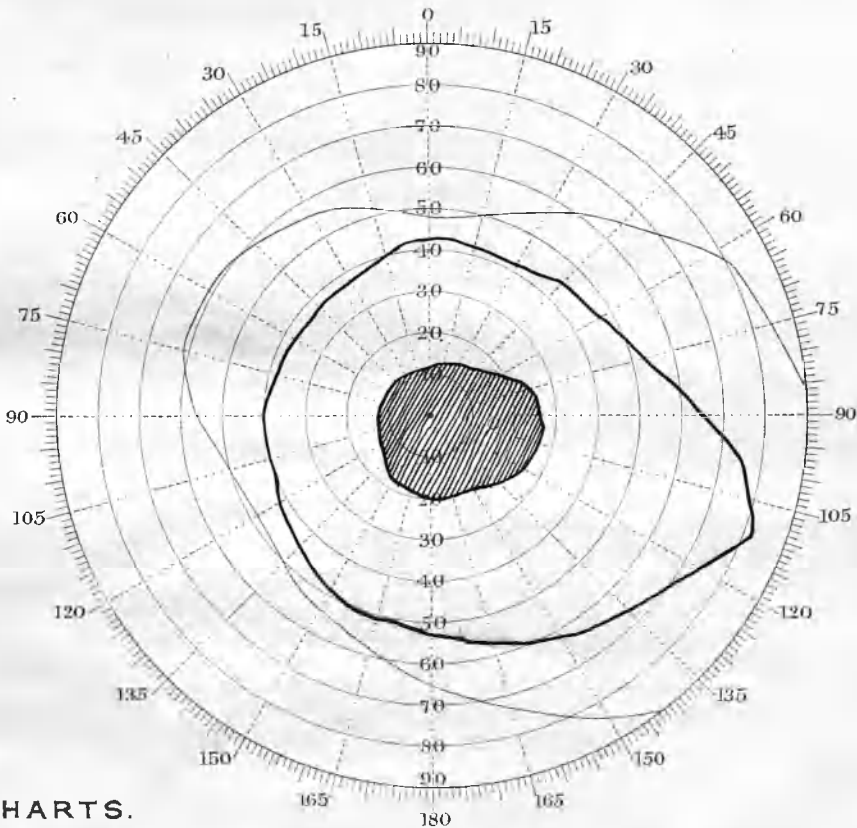
Refraction + 1.0

Strabismus has been present from childhood.

commencing to use the Automatic Registration.

2

RIGHT.



R CHARTS.

*of Indirect Vision: the small red circle the position of the blind spot.**Published by Mess^{rs} Curry & Parton, 195, G¹ Portland St, London, W.*

Jeanie Ramsay 15

1888

Strabismus Convergens in L.

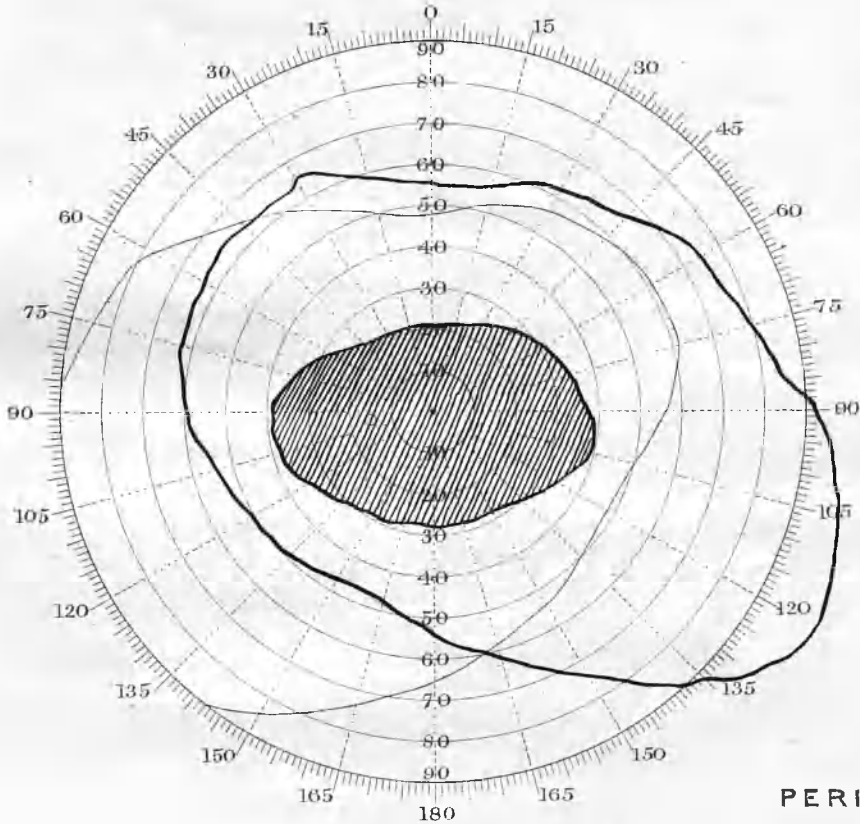
V. A. R. = No. 1

L. = No. 20

Refraction + 20

Centre each chart with 'pointer' at Zero before

LEFT.



The eccentric continuous red line indicates the average normal Field. Designed for use with Prof. McHardy's Registering Perimeter.

Katie Wilson 7

1888.

Strabismus Convergens in L.

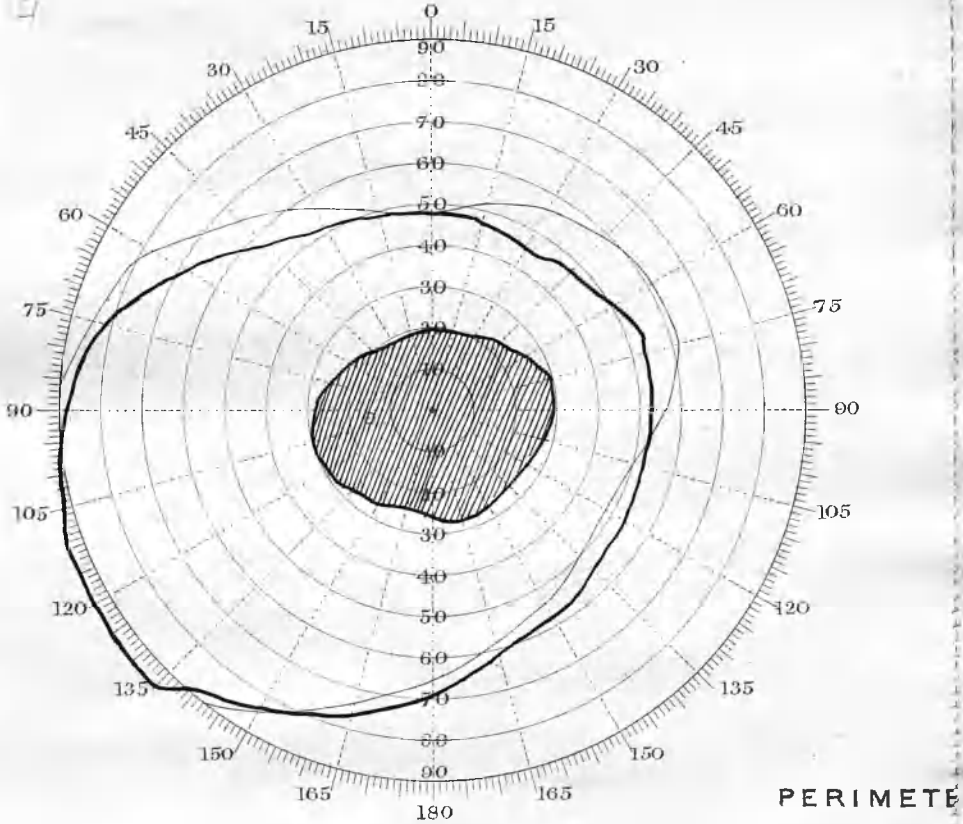
V. A.

R. = No. 1

L. = No. 20

Refraction + 2.50^D + 1.0 asty

*"Centre each chart with 'pointer' at Zero before
LEFT.*



*The concentric continuous red line indicates the average normal field.
Designed for use with Prof. McHardy's Registering Perimeter.*

W. Elder 10

22/1/90.

Strabismus Convergens in R.

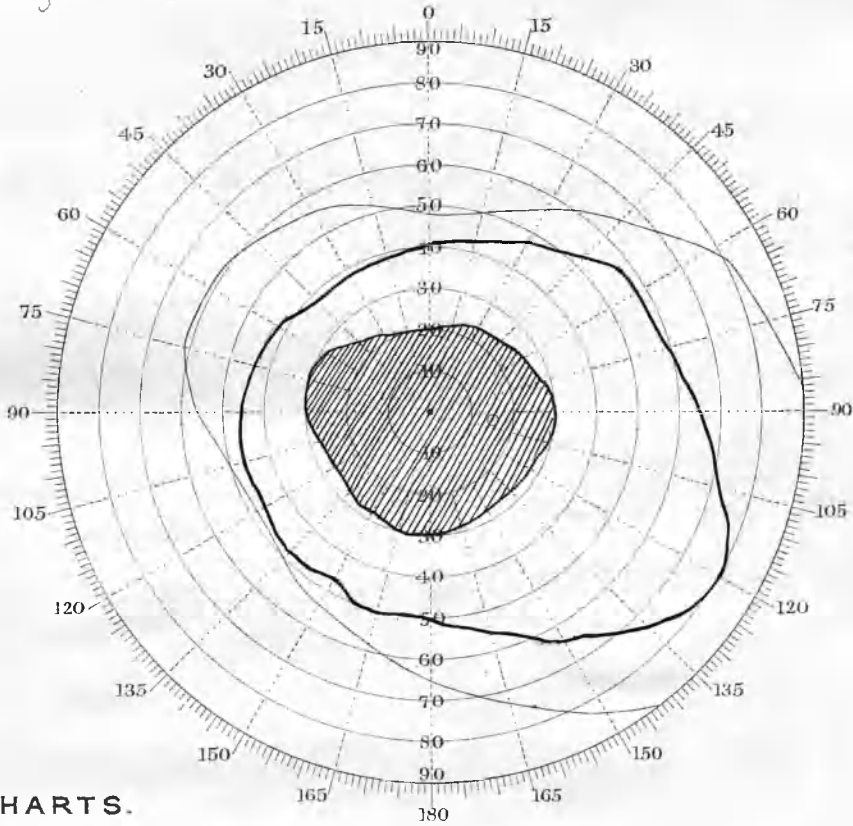
V, A. R. = No. 20

L. = No.

Refraction + 1.50^D

commencing to use the Automatic Registration.

RIGHT.



RIGHT CHARTS.

of Indirect Vision, the small red circle the position of the blind spot.

Published by Mess^{rs} Curry & Paxton, 195, Gst Portland St., London, W.

Miss McLean 34

Strabismus Convergens in L.

V. A.

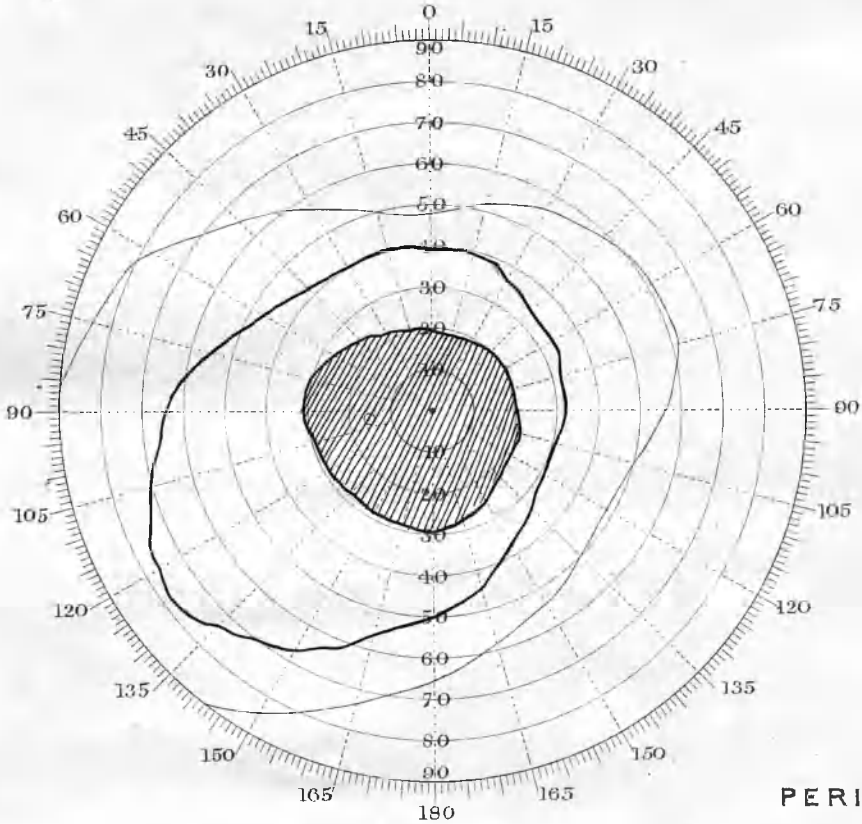
R. = No. 1

L. = No. 20

Refraction + 4.0

** Centre each chart with "pointer" at Zero before*

LEFT.



*The eccentric continuous red line indicates the average normal field.
Designed for use with Prof. M^{rs} Hardy's Registering Perimeter.*

Chas. McKinnon 14

Strabismus Convergens in R.

V. A.

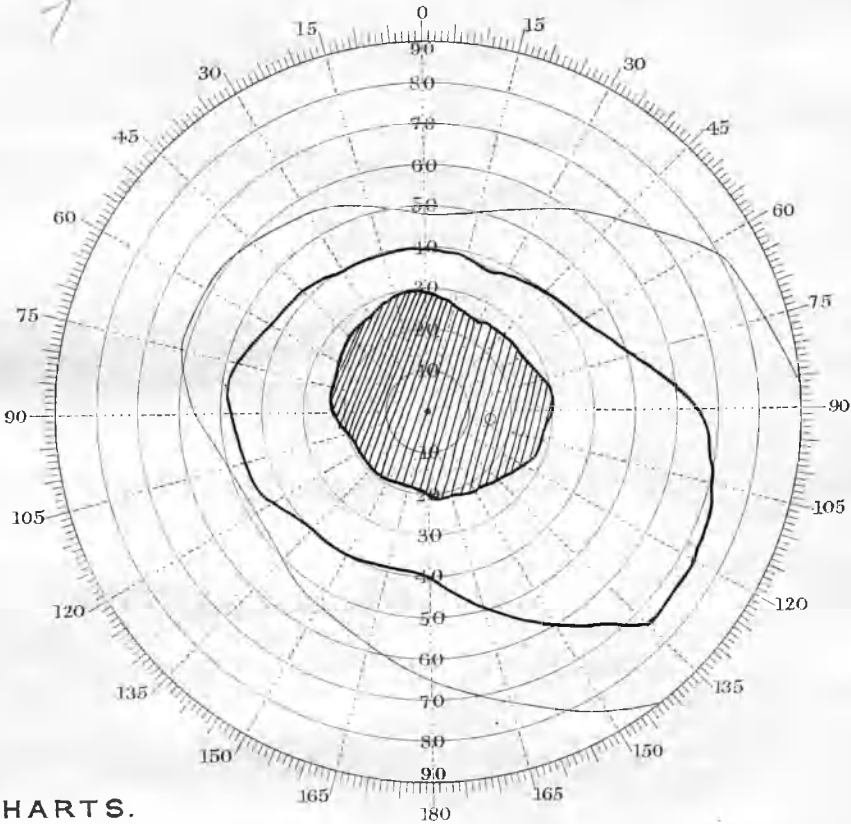
R. = No. 20

L. = No. 1

Refraction + 2.0

commencing to use the Automatic Registration.

RIGHT.



R CHARTS.

of Indirect Vision, the small red circle the position of the blind spot.

Published by Mess^{rs} Curry & Parton, 195, Gt Portland St, London, W.

Jessie Campbell 18

Strabismus Convergens in L.

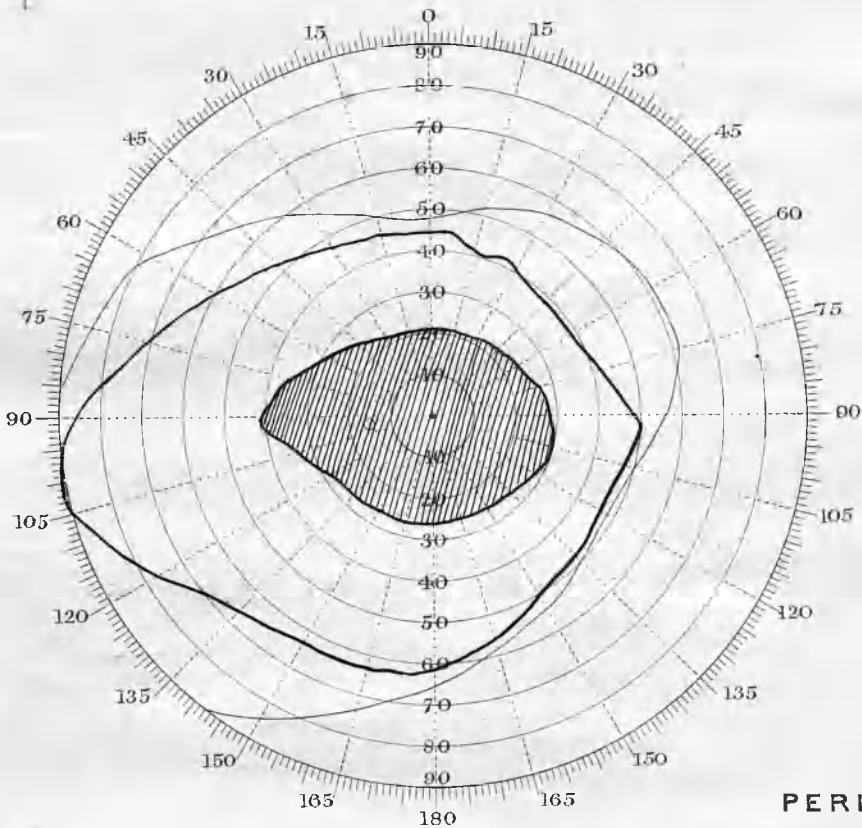
V. A.

R. = No. 1

L. = No. 20

Refraction + 4.0^D

*Centre each chart with "pointer" at Zero before
LEFT.*



*The eccentric continuous red line indicates the average normal field.
Designed for use with Prof. M^cHardy's Registering Perimeter.*

Sarah Sliminan 24

Strabismus Convergens L.

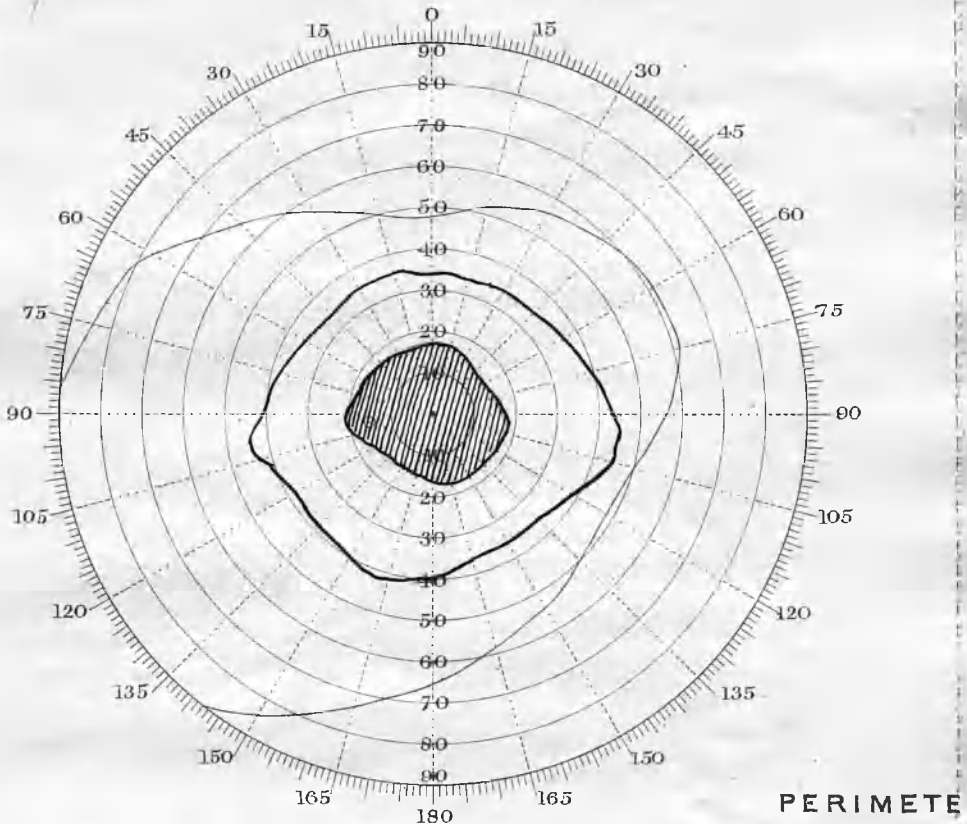
V. A.

R. = No. 1

L. = No. 16

Refraction + 2.0^D

"Centre each chart with pointer" at Zero before LEFT.



*The eccentric continuous red line indicates the average normal Field
Designed for use with Prof. McHardy's Registering Perimeter.*

Robert Finlay 19

Strabismus Convergens in L.

V, A.

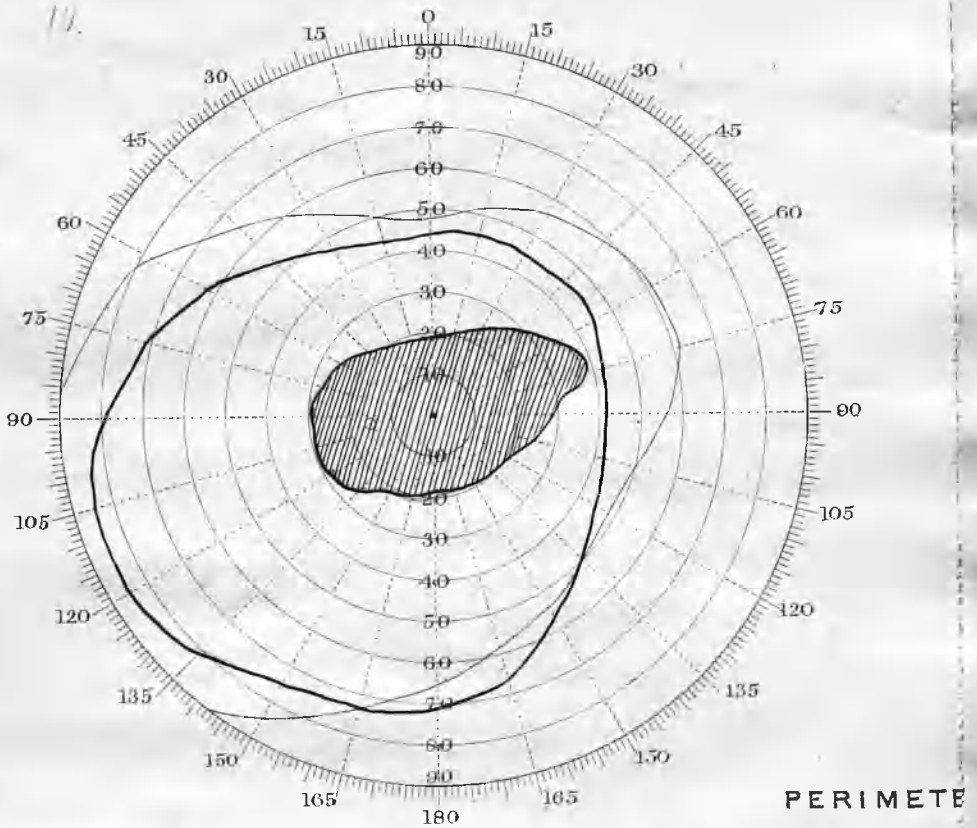
R. = No. 1

L. = No. 20

Refraction + 2.0

"Centre each chart with pointer" at Zero before

LEFT.



*The eccentric continuous red line indicates the average normal field
Designed for use with Prof. M^cHardy's Registering Perimeter.*

John Baird 12

5/8/87.

Strabismus Convergens in L.

V. A.

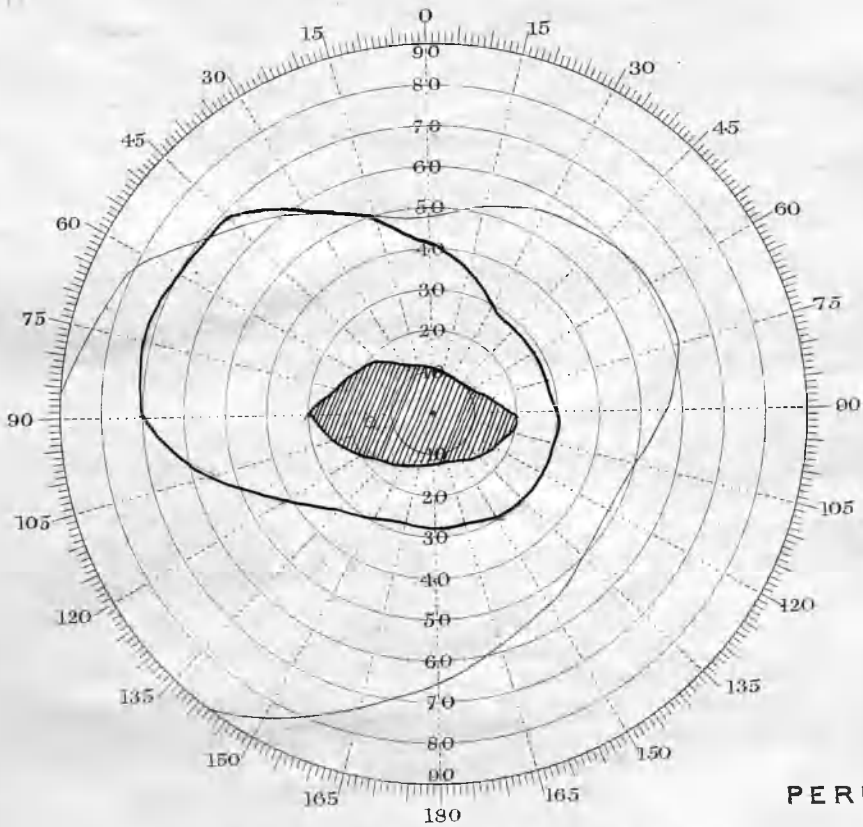
R. = No. 1

L. = No. 20

Refraction + 2.0^D

Centre each chart with pointer at Zero before

LEFT.



*The eccentric continuous red line indicates the average normal Field
Designed for use with Prof. M. Hardy's Registering Perimeter.*

William Elder 9

14/11/90.

Strabismus Convergens in R.

V. A.

R. = No. 20

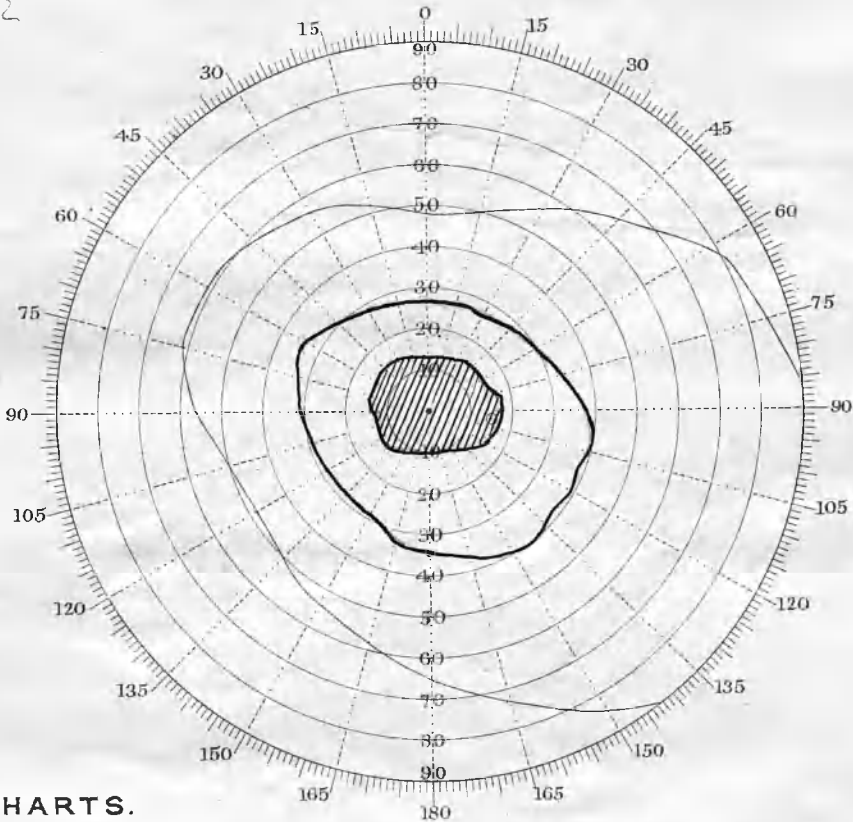
L. = No. 1

Refraction + 2.0^D

commencing to use the Automatic Registration.

RIGHT.

12



R CHARTS.

of Indirect Vision, the small red circle the position of the blind spot.

Published by Messrs Curry & Paxton, 195, G^t Portland St., London, W.

John Mair 9

12/3/90

Strabismus Convergens in L.

V, A.

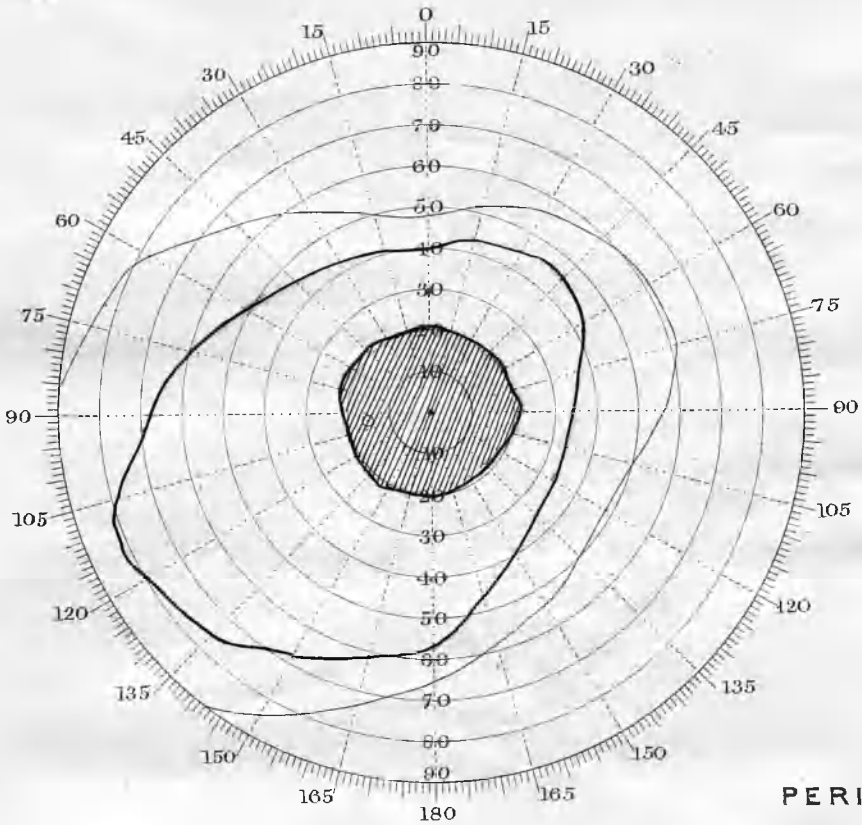
R. = No. 1

L. = No. 20

Refraction + 5.0^D

Centre each chart with "pointer" at Zero before

LEFT.



PERIMETER

*The eccentric continuous red line indicates the average normal field.
Designed for use with Prof. McHardy's Registering Perimeter.*

A. Paterson 15

July, 1889.

Strabismus Convergens in L.

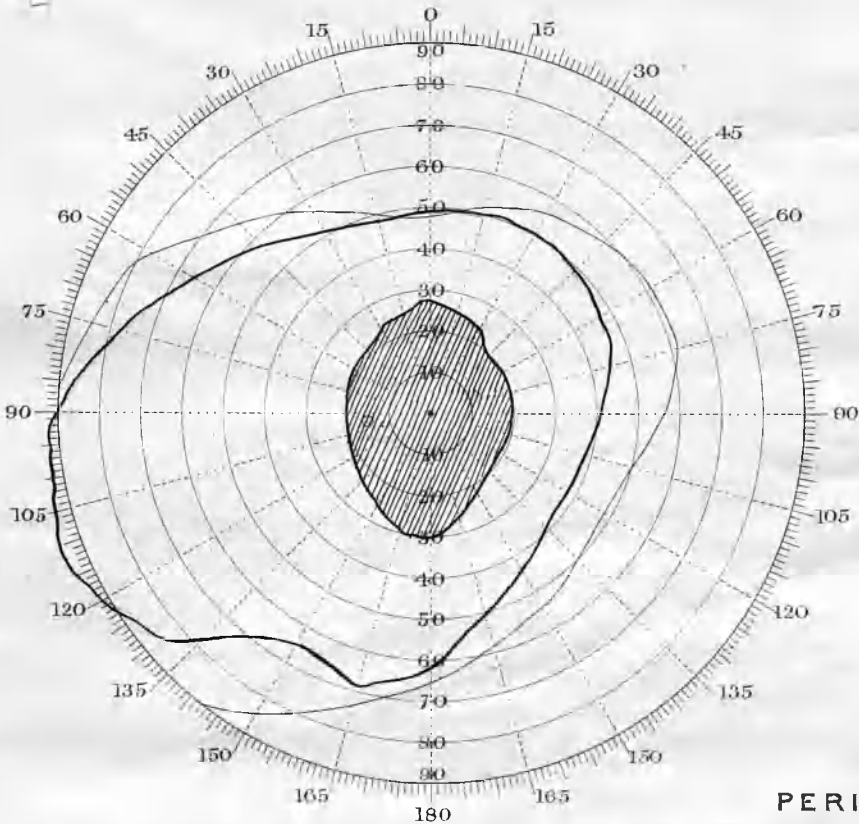
V. A.

R. = No. 1

L. = No. 20

Refraction + 4.0^D

*Centre each chart with "pointer" at Zero before
LEFT.*



*The eccentric continuous red line indicates the average normal field.
Designed for use with Prof. McHardy's Registering Perimeter.*

Martha Paxton 16

13/3/90

Strabismus Convergens in L.

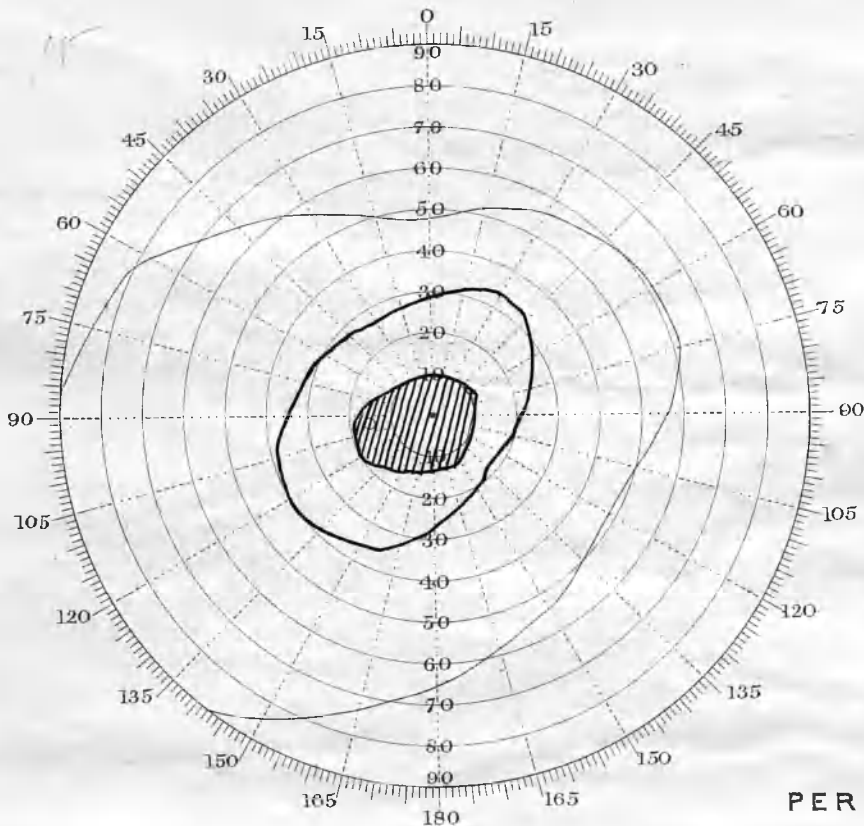
V, A.

R. = No. 1

L. = No. 20

Refraction + 2.0^D

**Centre each chart with "pointer" at Zero before
LEFT.*



*The eccentric continuous red line indicates the average normal field.
Designed for use with Prof. McHardy's Registering Perimeter.*

Maggie McLachland 19

July 1889.

Strabismus Convergens in L.

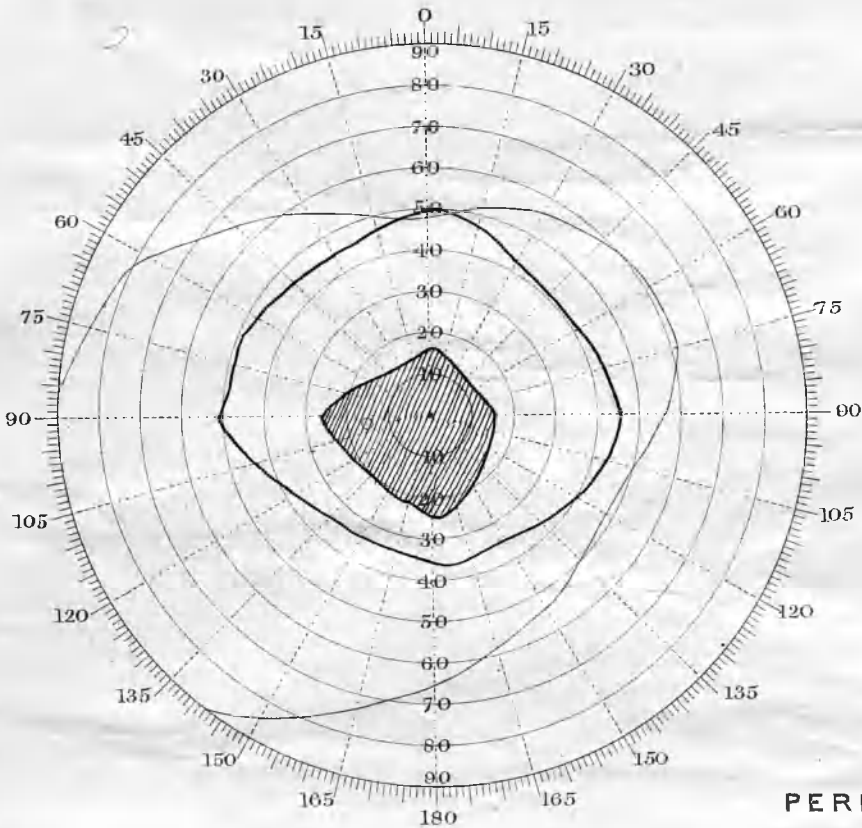
V. A.

R. = No. 1

L. = No. 20

Refraction + 2.0

Centre each chart with "pointer" at Zero before LEFT.



The eccentric continuous red line indicates the average normal field. Designed for use with Prof. M. Hardy's Registering Perimeter.

Maggie Alexander 10

Strabismus Convergens in L.

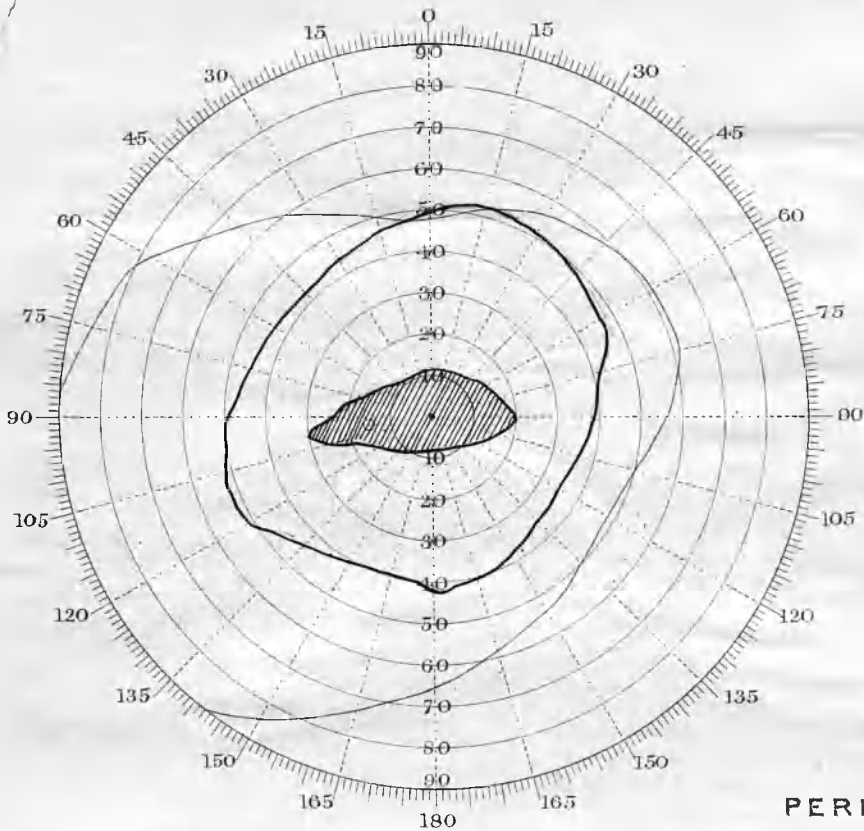
V. A.

R. = No. 1

L. = No. 20

Refraction + 2.5^D

*"Centre each chart with pointer" at Zero before
LEFT.*



*The eccentric continuous red line indicates the average normal field.
Designed for use with Prof. M. Hardy's Registering Perimeter.*

Ise Mulliholland 10

3/3/90

Strabismus Convergens in L.

V, A.

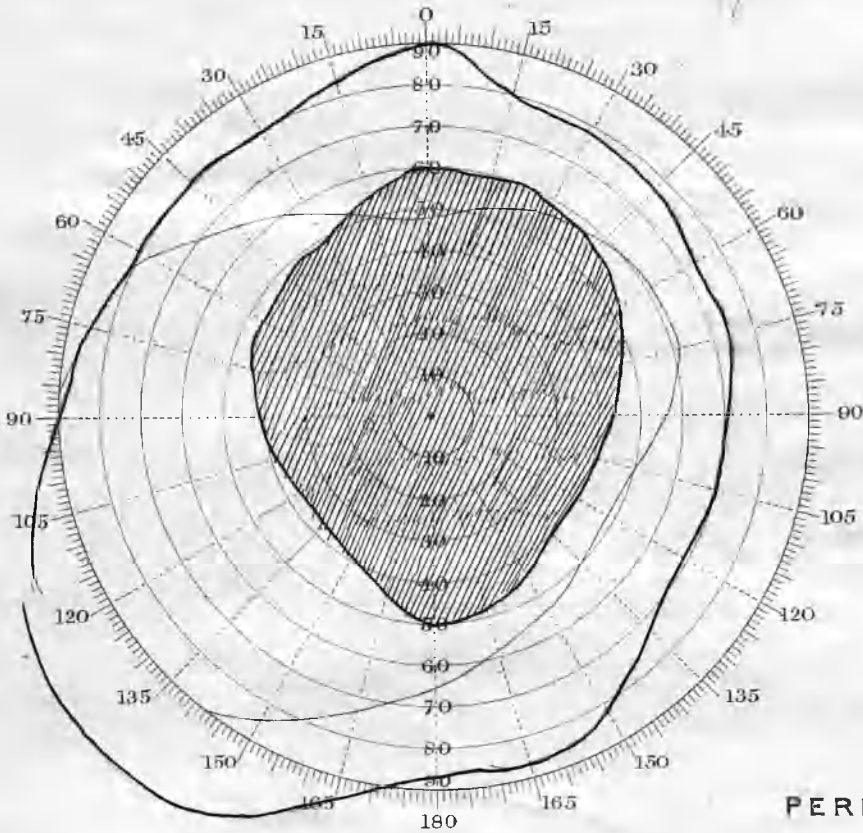
R. = No. 1

L. = No. 20

Refraction + 9.0^D

Centre each chart with 'pointer' at Zero before

LEFT.



*The eccentric continuous red line indicates the average normal field.
Designed for use with Prof. McHardy's Registering Perimeter.*

Jas. Irvine 9

3/1/89

Strabismus Convergens in L.

V, A.

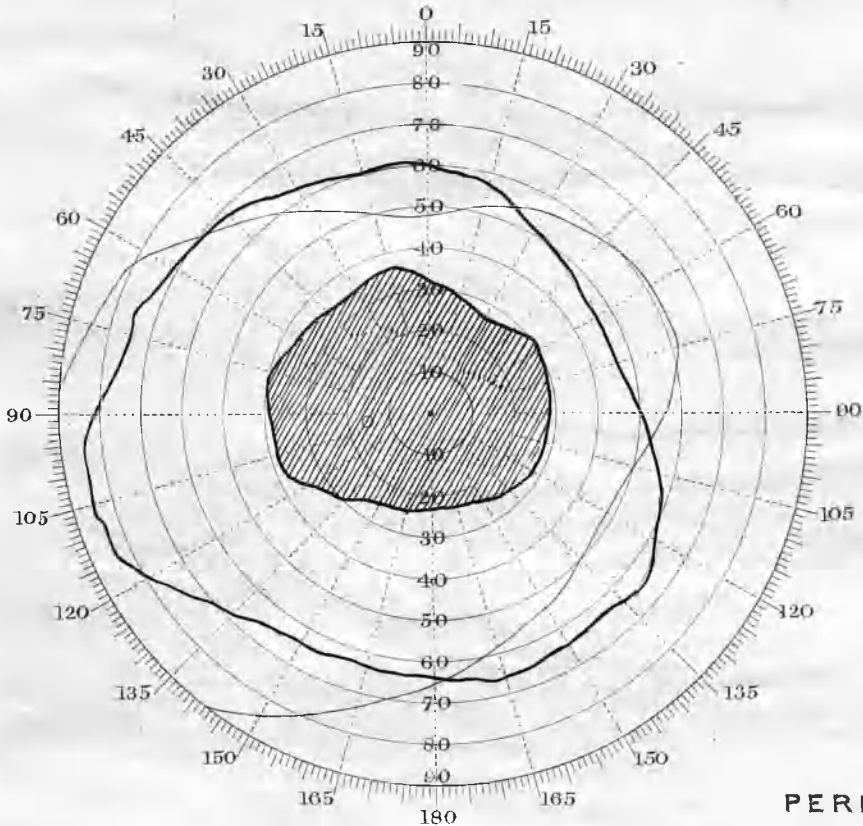
R. = No. 1

L. = No. 20

Refraction + 2.50^D

"Centre each chart with pointer at Zero before
LEFT.

19



The eccentric continuous red line indicates the average normal field.
Designed for use with Prof. M^cHardy's Registering Perimeter.

Strabismus Convergens in R.

V, A.

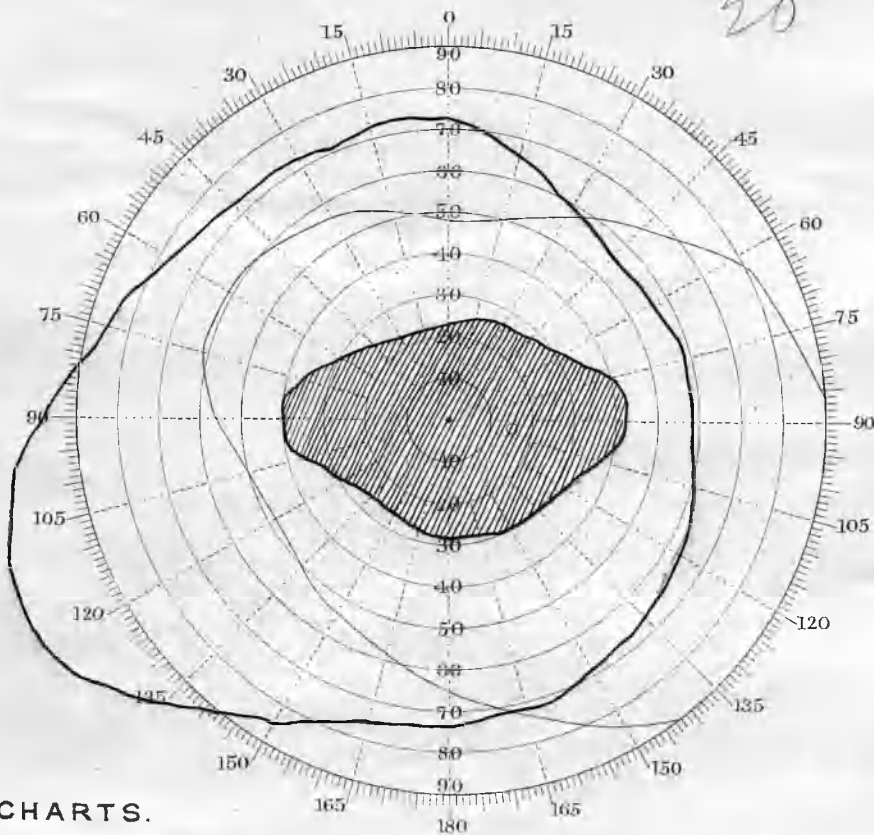
R. = No. 20

L. = No. 1

Refraction + 3.0^D

commencing to use the Automatic Registration.

RIGHT.



R CHARTS.

of Indirect Vision the small red circle the position of the blind spot.

Published by Mess^{rs} Curry & Paxton, 195, Gt. Portland St., London, W

Jas. Irvine 14

1888.

Strabismus Convergens in L.

V, A.

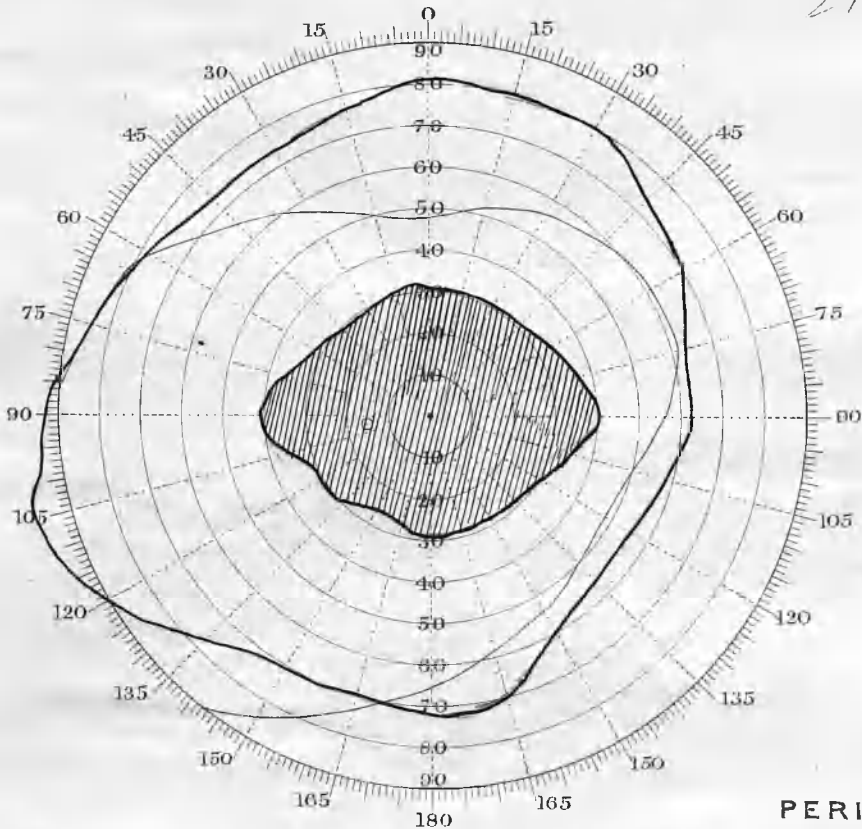
R. = No. 1

L. = No. 20

Refraction + 3.0^D

Centre each chart with "pointer" at Zero before
LEFT.

21



The eccentric continuous red line indicates the average normal field.
Designed for use with Prof. McHardy's Registering Perimeter.

Jas. Brown 9

Perth

1890.

Strabismus Convergens in L.

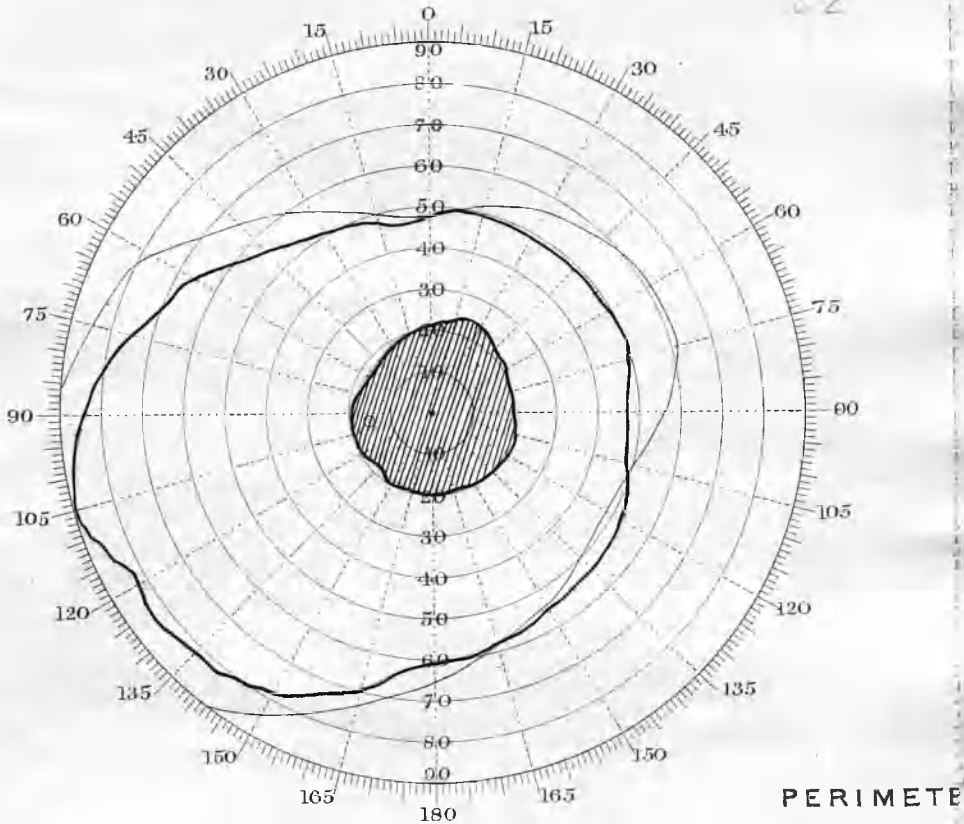
V. A.

R. = No. 1

L. = No. 20

Refraction + 2.0^D

"Centre each chart with pointer" at Zero before LEFT.



The eccentric continuous red line indicates the average normal field. Designed for use with Prof. McHardy's Registering Perimeter.

R. Reach 18

Strabismus Convergens in R.

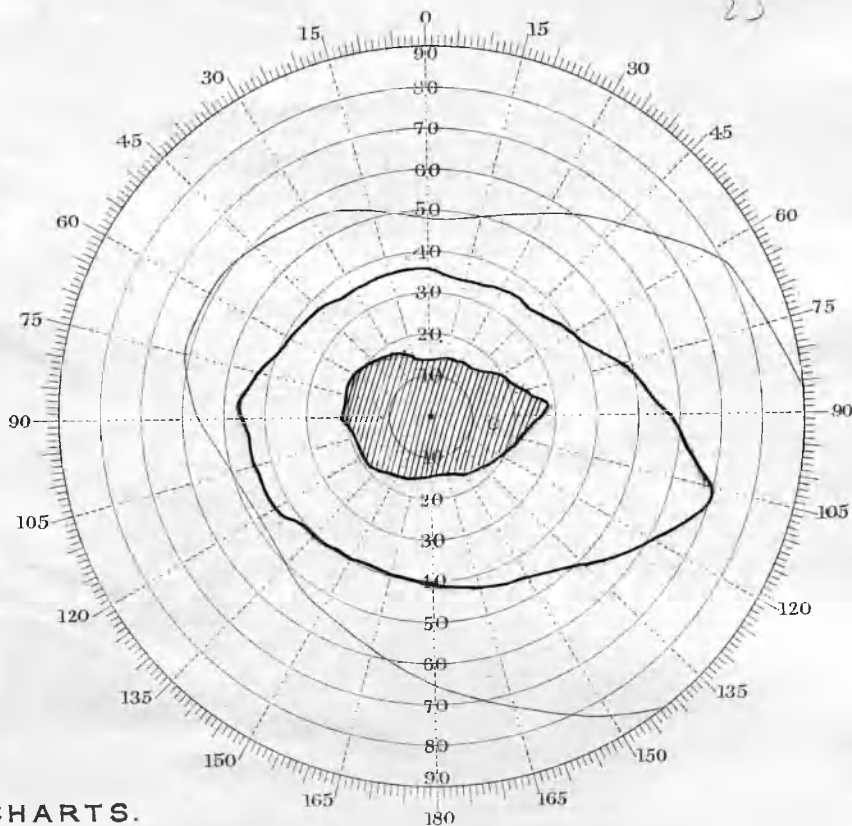
V. A.

R. = No. 20

L. = No. 1

Refraction + 3.0^D*commencing to use the Automatic Registration.*

RIGHT.



R CHARTS.

*of Indirect Vision, the small red circle the position of the blind spot.**Published by Mess^{rs} Curry & Paxton, 195, G^t Portland St., London, W.*

Christina McIntosh 9

Strabismus Convergens in L.

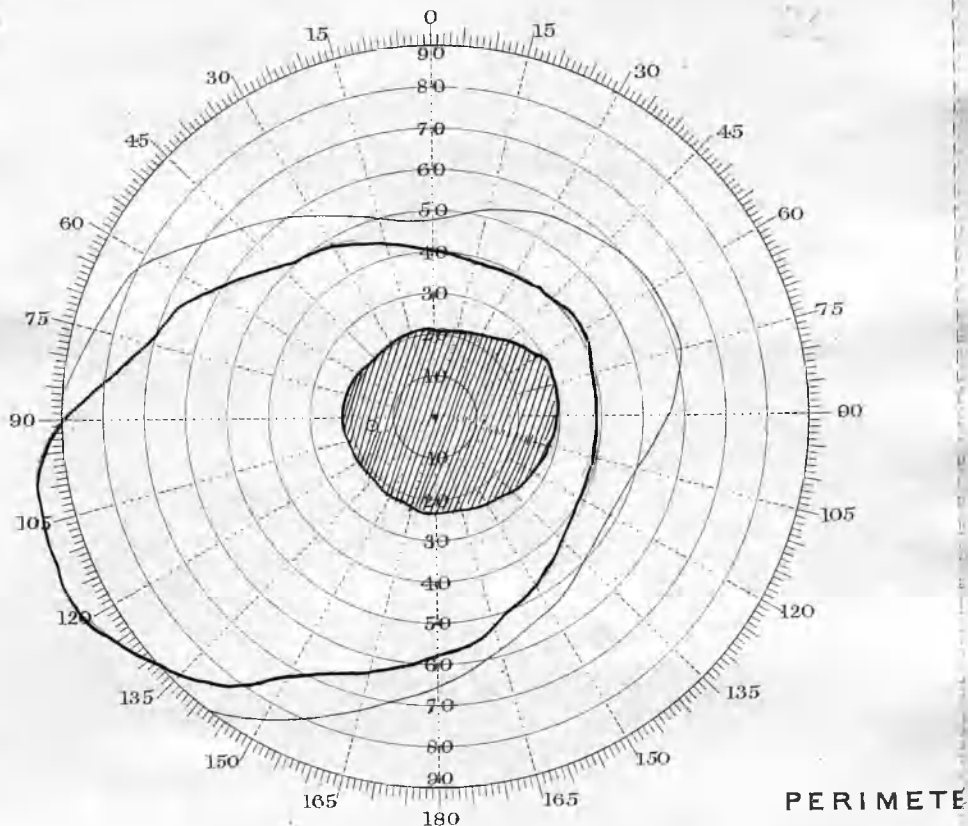
V. A.

R.=No.1

L. = fingers only

Refraction + 2.0  + 0.50^D astig

Centre each chart with "pointer" at Zero before
LEFT.



The eccentric continuous red line indicates the average normal field.
Designed for use with Prof. McHardy's Registering Perimeter.

Miss Hodge 22

Montrose

23/3/90

Strabismus Convergens in R.

V. A.

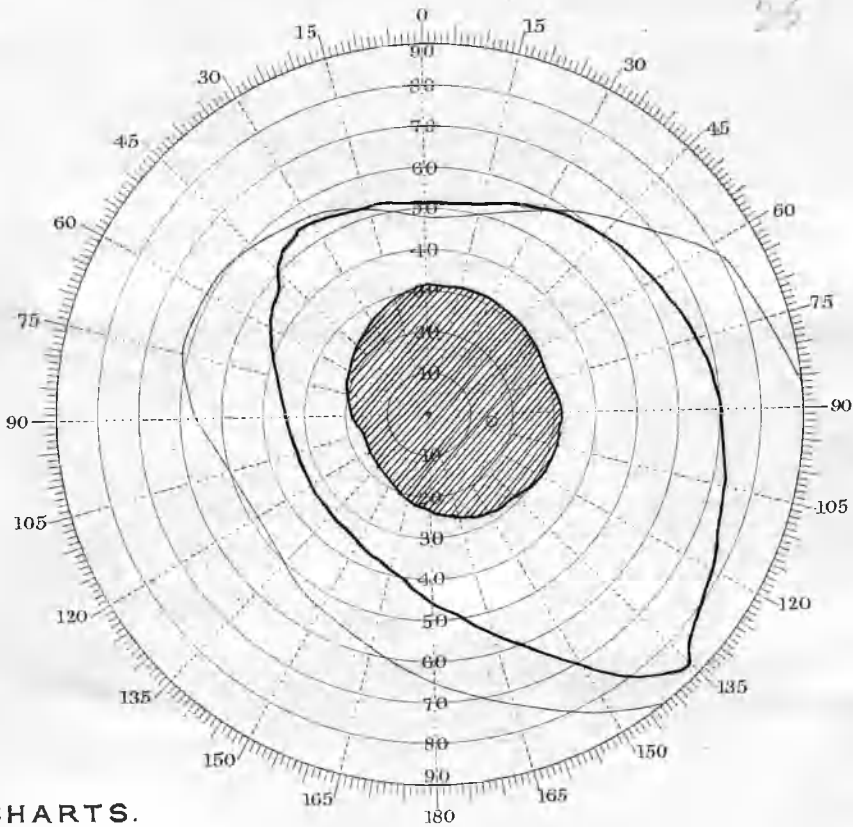
R. = No. 20

L. = No. 1

Refraction $\pm 2.0^D$

commencing to use the Automatic Registration.

RIGHT.



R CHARTS.

of Indirect Vision; the small red circle the position of the blind spot.

Published by Mess^{rs} Curry & Paxton, 195, G¹ Portland St., London, W

John Thyme 12

8/12/88.

Strabismus Convergens in R.

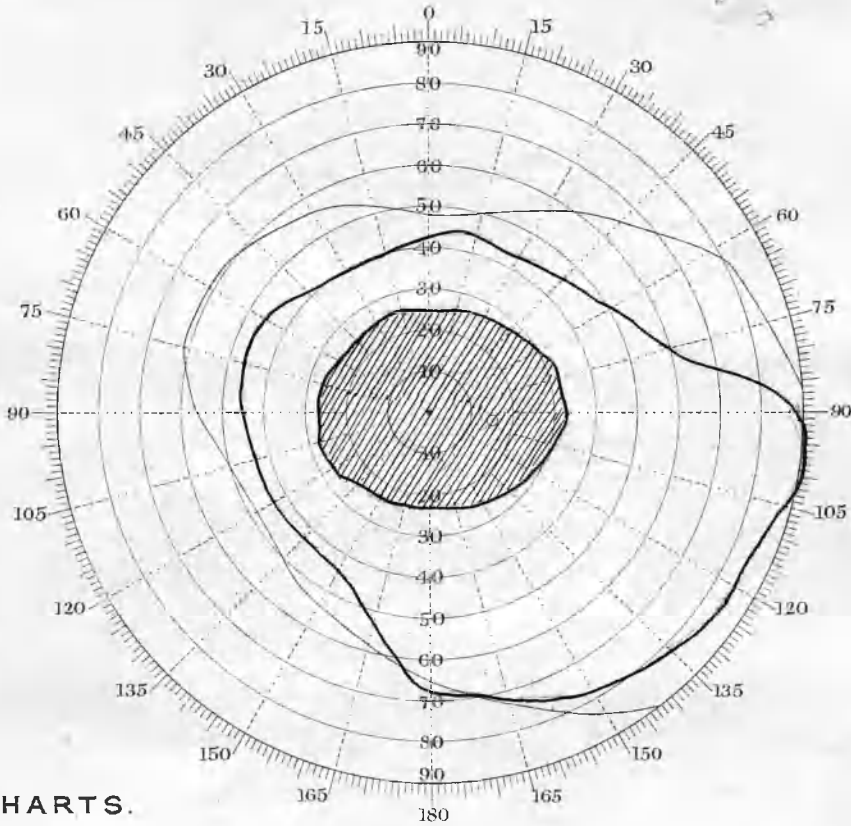
V. A.

R. = No. 18

L. = No. 1

Refraction + 2.0^D*commencing to use the Automatic Registration*

RIGHT.



R CHARTS.

*A of Indirect Vision, the small red circle the position of the blind spot.**Published by Mess^{rs} Curry & Paxton, 195, G^t Portland St, London, W.*

Harry Oddam 12

7/12/88

Strabismus Convergens in R.

V. A.

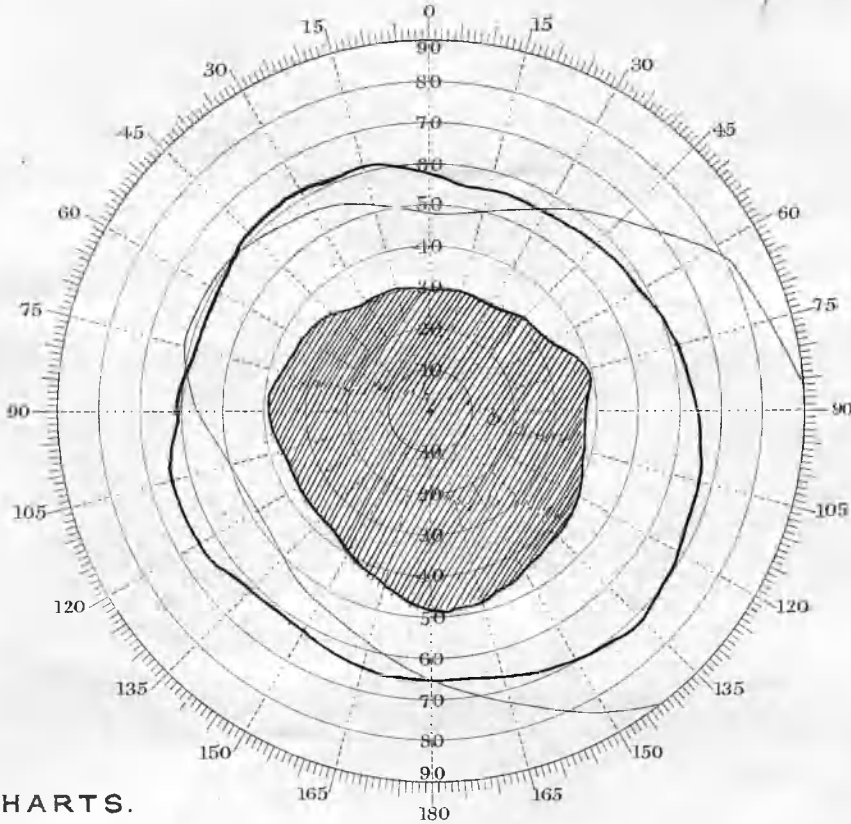
R. = No. 18

L. = No. 6

Refraction + 3.0^D

commencing to use the Automatic Registration

RIGHT.



R CHARTS.

of Indirect Vision, the small red circle the position of the blind spot.

Published by Mess^{rs} Curry & Paxton, 195, G^t Portland St. London, W.

Maggie Stitt 12

1888

Strabismus Convergens in R.

V. A.

R. = No. 20

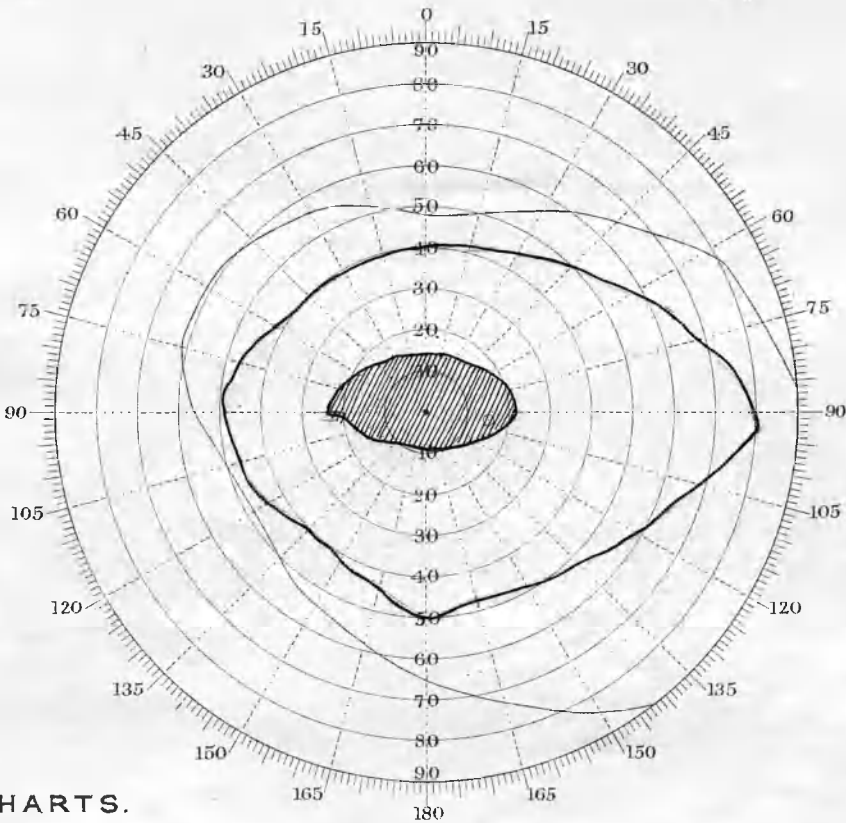
L. = No. 1

Refraction + 2.0^D

commencing to use the Automatic Registration.

RIGHT.

28



R CHARTS.

of Indirect Vision, the small red circle the position of the blind spot.

Published by Mess^{rs} Curry & Paxton, 195, Gst Portland S^t, London, W.

Katie Ewing 12

21/3/90

Strabismus Convergens in L.

V. A.

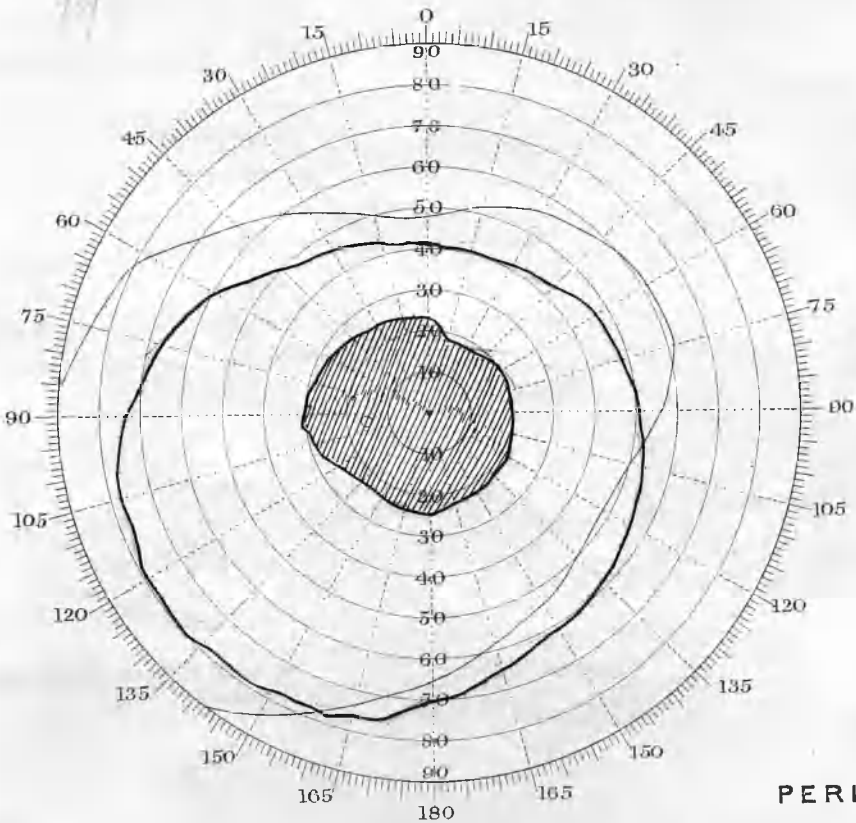
R. = No. 1

L. = No. 20

Refraction + 3.0^D

"Centre each chart with pointer" at Zero before

LEFT.



*The eccentric continuous red line indicates the average normal Field
Designed for use with Prof. M^cHardy's Registering Perimeter.*

John Hepburn 13

Sept. 1888

Strabismus Convergens in R.

V. A.

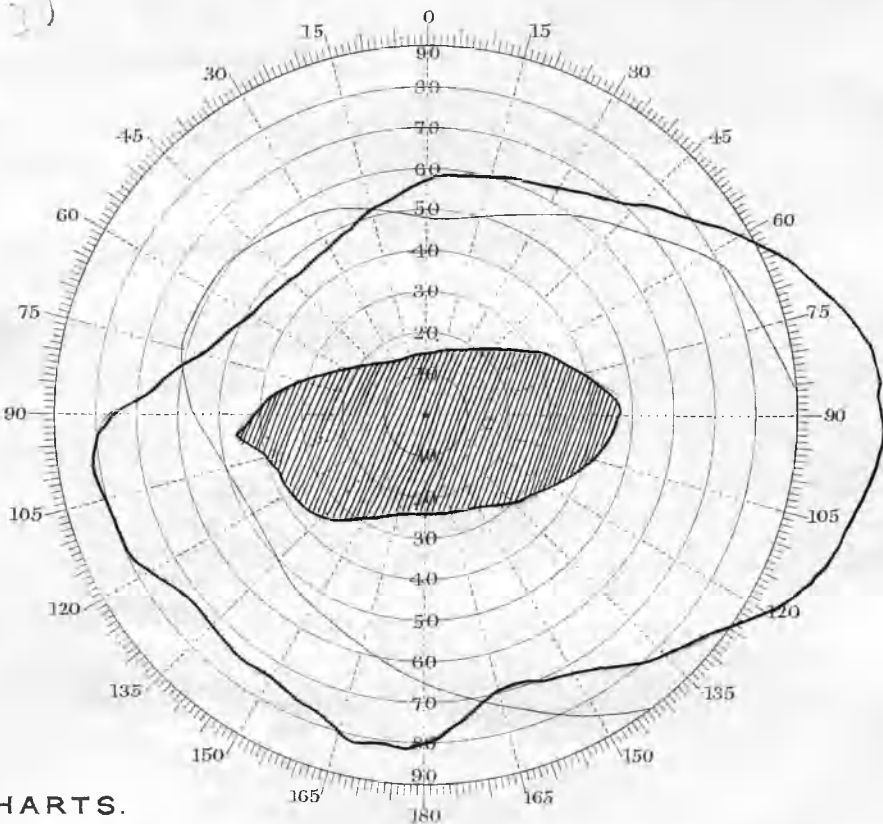
R. = No. 20

L. = No. 1

Refraction + 2.0^D

commencing to use the Automatic Registration.

RIGHT.



R CHARTS.

of Indirect Vision, the small red circle the position of the blind spot.

Published by Mess^{rs} Curry & Paxton, 195, G¹ Portland St, London, W.

Jane Urquhart 12

August 1888

Strabismus Convergens in L.

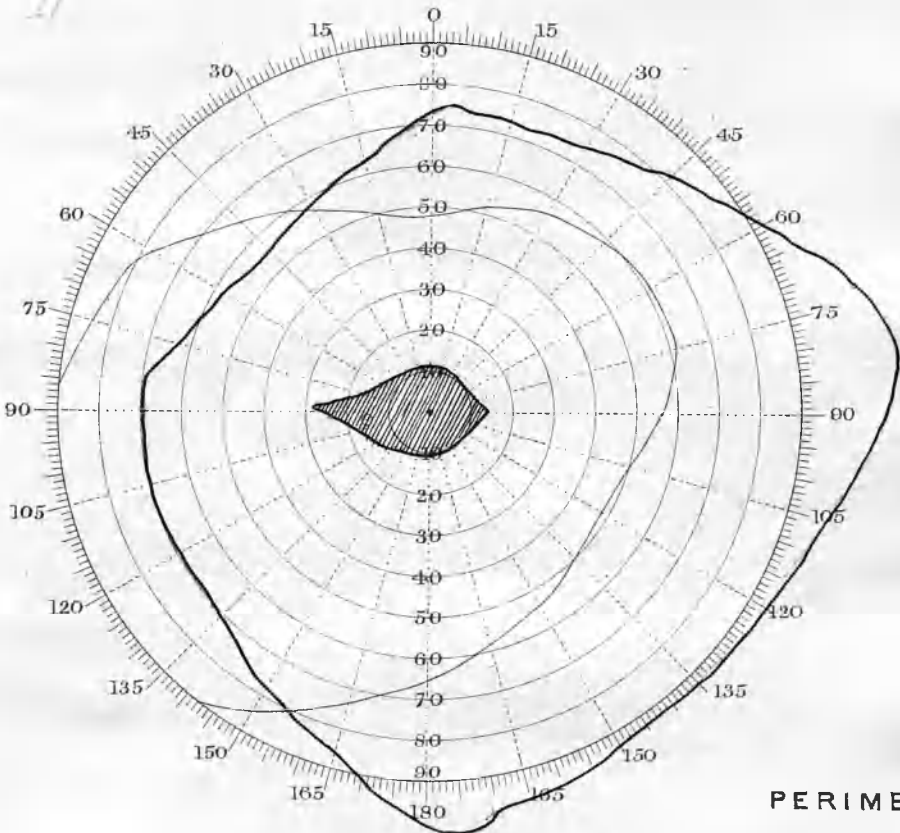
V, A.

R. = No. 1

L. = No. 18

Refraction \mp 3.0^D

Centre each chart with "pointer" at Zero before
LEFT.



The eccentric continuous red line indicates the average normal Field
Designed for use with Prof. McHardy's Registering Perimeter.

Annie Love 17

Sept. 1888.

Strabismus Convergens in L.

V. A.

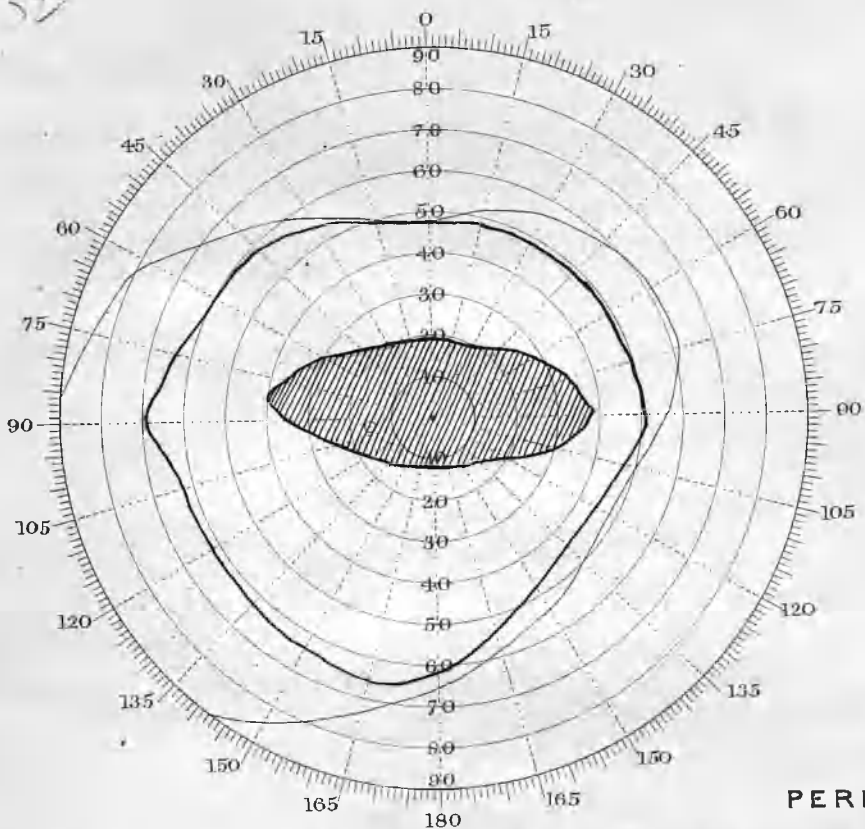
R. = No. 1

L. = No. 20

Refraction + 2.0^D

Centre each chart with "pointer" at Zero before

LEFT.



PERIMETER

The eccentric continuous red line indicates the average normal field. Designed for use with Prof. McHardy's Registering Perimeter.

William Wallace 15

Oct. 1888.

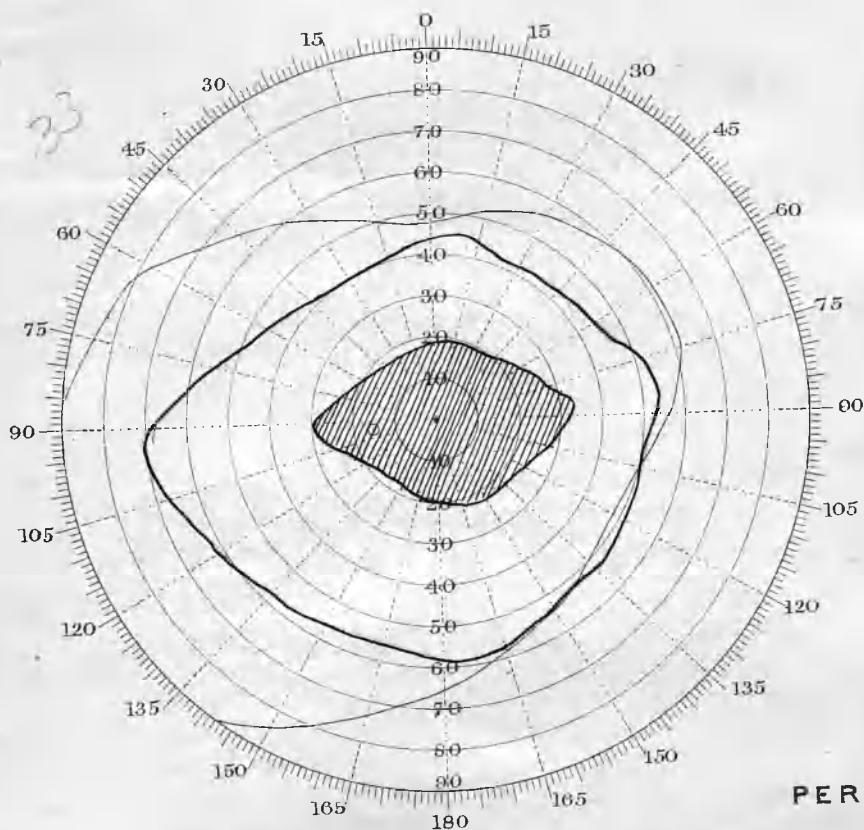
Had internal strabismus, he was 2 years of age, which
was cured by suitable glasses.

R.
V. A. 6/9 No. 1

L. 6/60 No. 20
Refraction + 2.0^D

"Centre each chart with pointer at Zero before

LEFT.



*The eccentric continuous red line indicates the average normal field.
Designed for use with Prof. McHardy's Registering Perimeter.*

Jas. Dick 19

Stirling

27/10/88

Left operated on by Dr. Reid 12 years ago. When looking at a distance axes almost parallel.

V. A.

R.

L.

6/6 Read No. 1

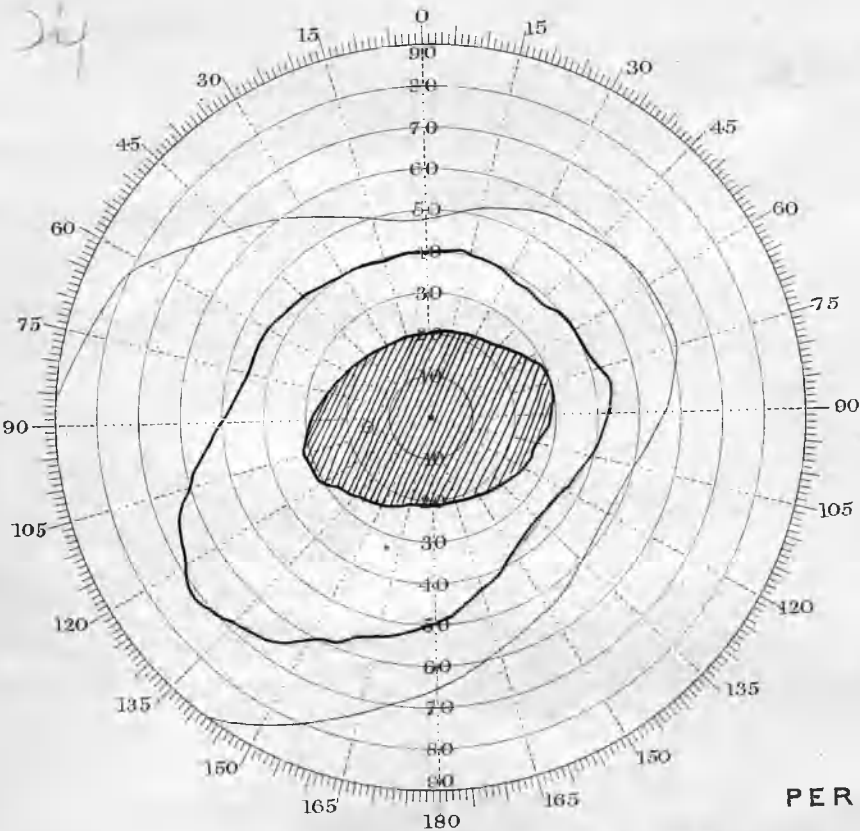
6/60 under

Read 20.

Refraction + 2.0^D

"Centre each chart with 'pointer' at Zero before

LEFT.



*The eccentric continuous red line indicates the average normal field.
Designed for use with Prof. McHardy's Registering Perimeter.*

Maggie Marshall 13

6th. Nov. 1888.

Internal Strabismus R.

V. A.

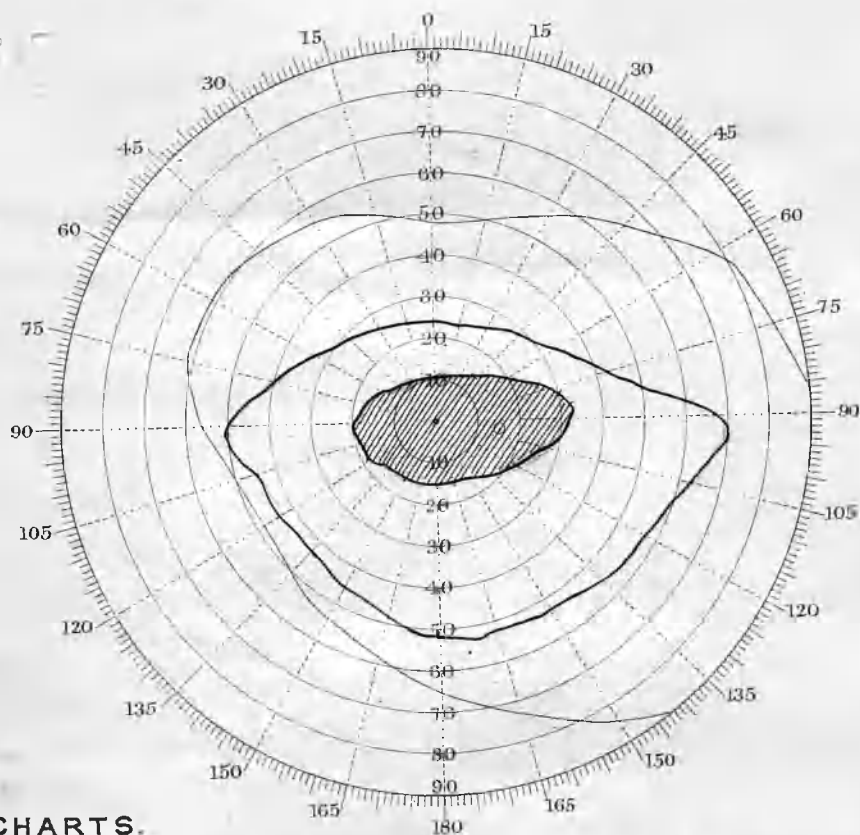
R.

L. = No. 1

6/36 No.16 J.

Refraction + 2.0^D*commencing to use the Automatic Registration.*

RIGHT.



R CHARTS.

*A of Indirect Vision, the small red circle the position of the blind spot.**Published by Mess^{rs} Curry & Paxton, 195, Grd Portland St^l London, W.*

Maggie Martin

12

Montrose

Internal Strab. of L.

V. A.

L.

6/60 under

R.

6/6

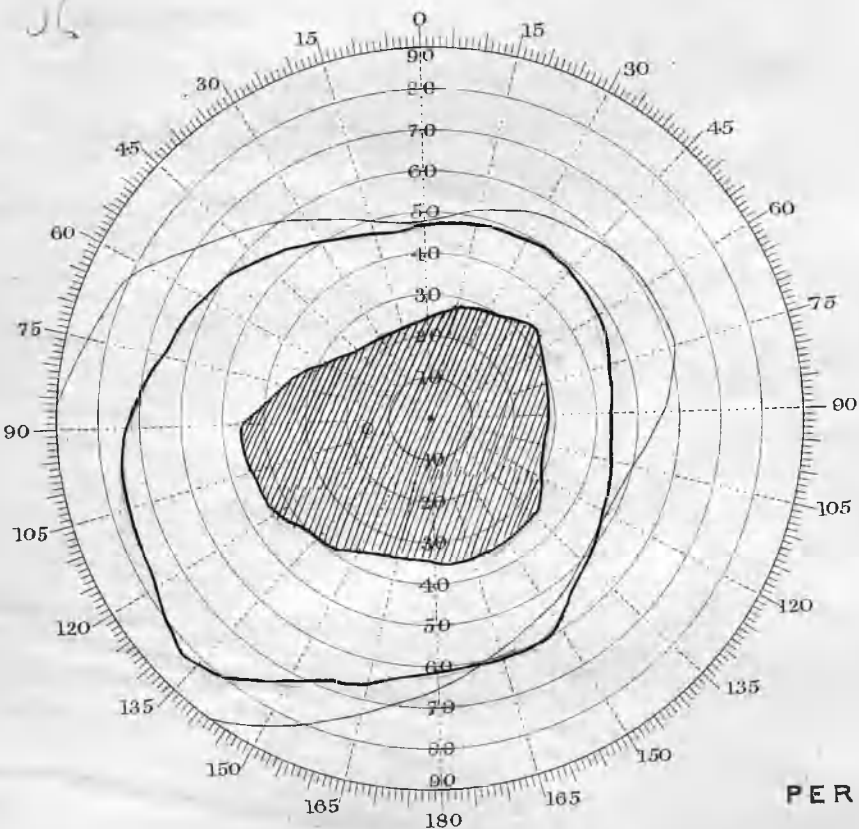
No. 1

Refraction

+

3.0^D

Centre each chart with "pointer" at Zero before LEFT.



PERIMETER

The eccentric continuous red line indicates the average normal Field. Designed for use with Prof. McHardy's Registering Perimeter.

Asher Shand 19

20/11/88.

R. +1.50 nerve slightly oval, this eye was affected with Strabismus in childhood and came straight without operation or correcting glasses.

Reads No. 18 J.

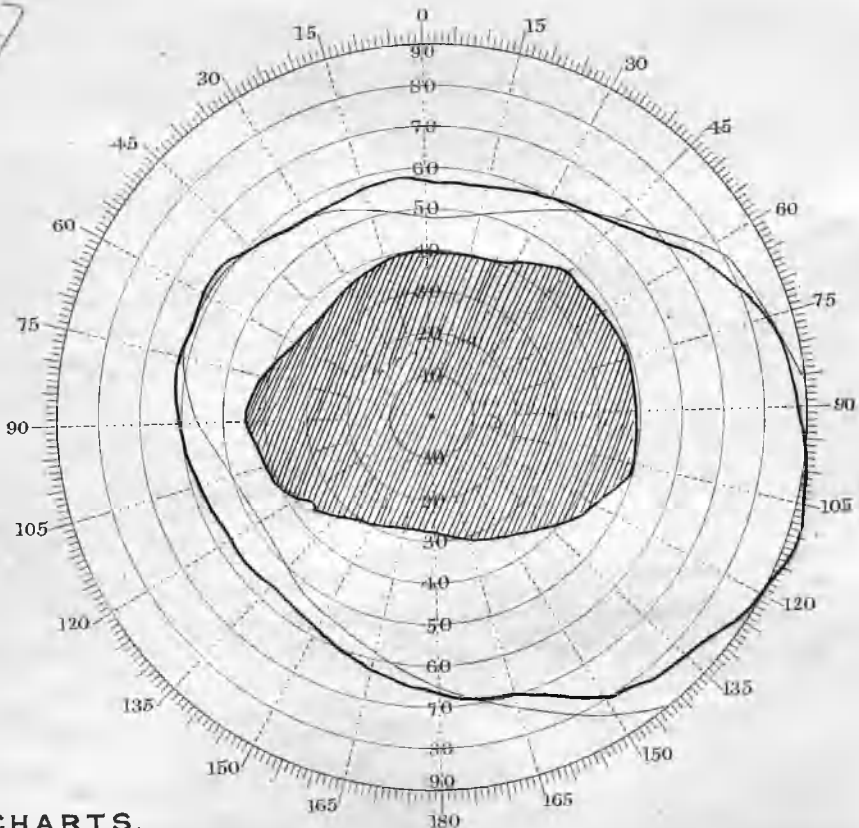
L. +1.50^D nerve slightly oval, veins large and pulsating physiological cup deep and situated towards the temporal side Read No. 1

+ 2.0 ordered

Refraction + 2.0^D

commencing to use the Automatic Registration.

RIGHT.



R CHARTS.

of Indirect Vision, the small red circle the position of the blind spot.

Published by Mess^{rs} Curry & Paxton, 195, Gth Portland St^h, London, W.

Maggie Rothery 10 Irvine.

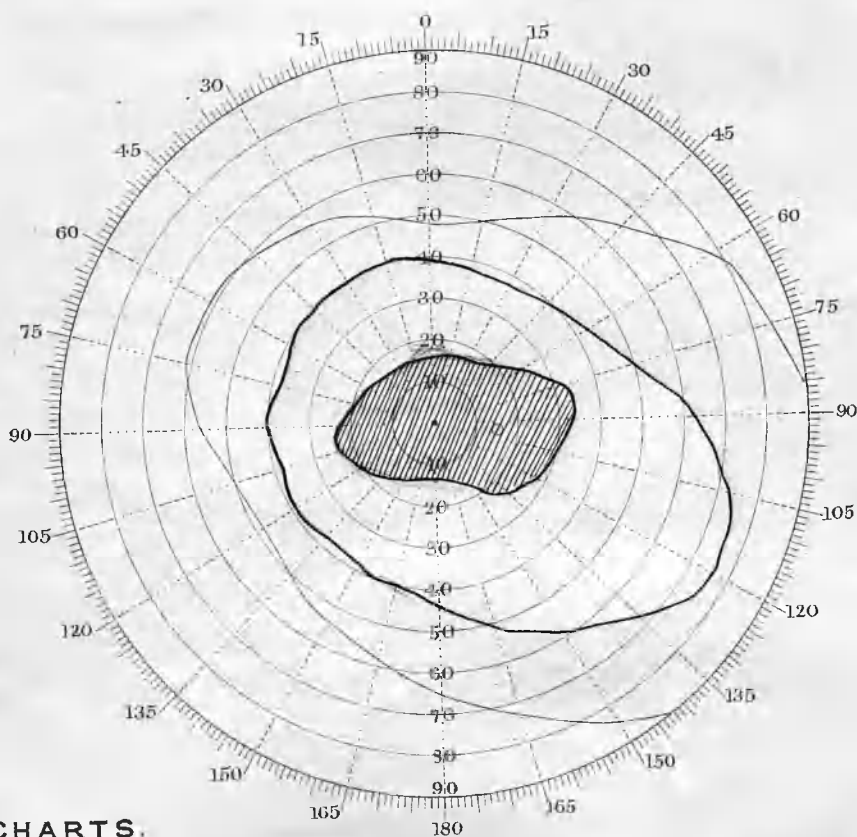
Internal Strabismus in R.

R. The choro capillaries well seen, atrophy choroid
Nerve oval Reads No. 20.L. Choroid pigment scattered, aggregate round the
nerve generally thinning of the choroid

Reads No. 1

Refraction + 3.0^D*commencing to use the Automatic Registration.*

RIGHT.



R CHARTS.

*In Indirect Vision, the small red circle the position of the blind spot.**Published by Mess^{rs} Curry & Paxton, 195, Grd Portland St, London, W.*

Maggie Pollock 26

Internal Strabismus in R.

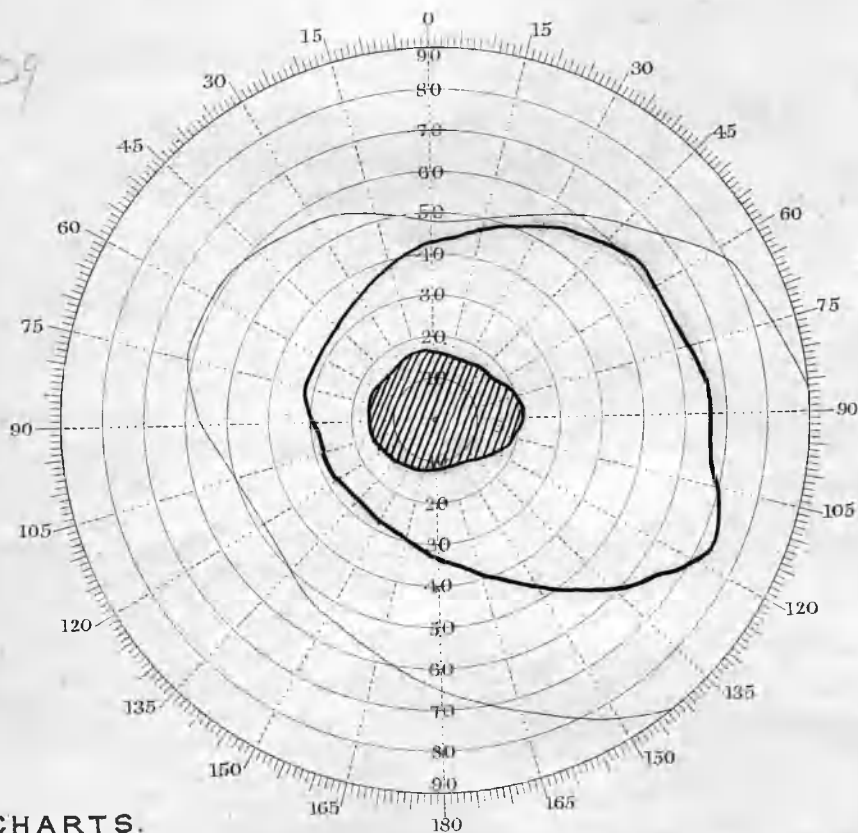
V. A.

R.

6/60 under Reads No. 20

Refraction + 2.50^D*commencing to use the Automatic Registration.*

RIGHT.



R CHARTS.

*In Indirect Vision, the small red circle the position of the blind spot.**Published by Mess^{rs} Curry & Parton, 195, Grd Portland St., London, W.*

Jas. Drysdale 8

Paisley

19/4/94

Internal Strabismus in L.

V. A.

R.

L.

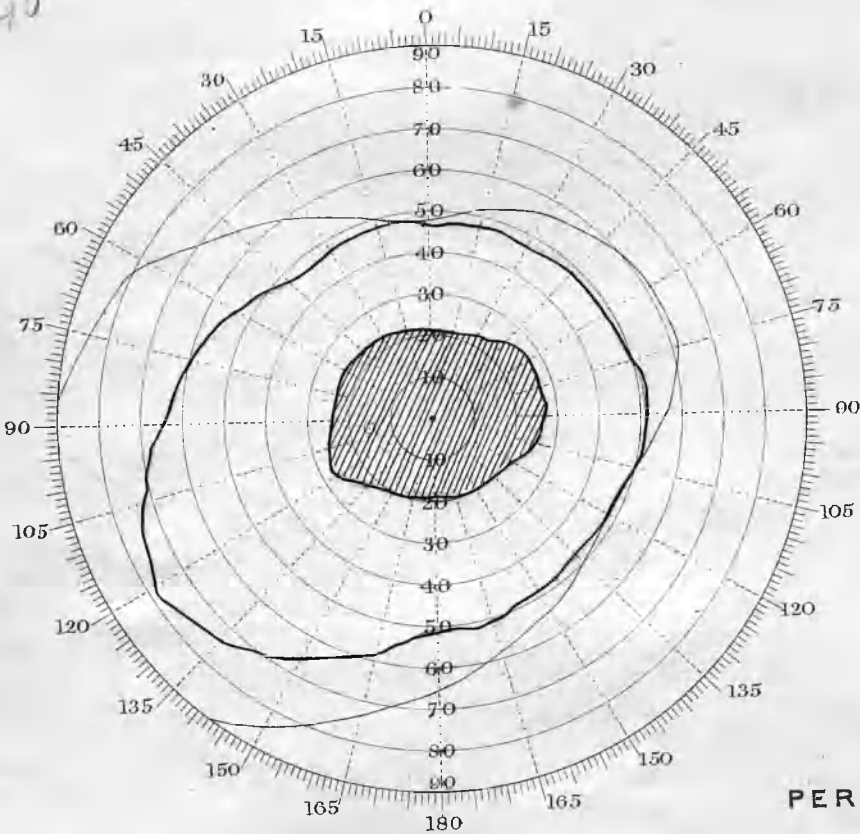
No. 1

No. 16

Refraction + 3.0^D

Centre each chart with "pointer" at Zero before
LEFT.

40



The eccentric continuous red line indicates the average normal Field.
Designed for use with Prof. McHardy's Registering Perimeter.

R. Mather 9

Montrose

Internal Strabismus in L.

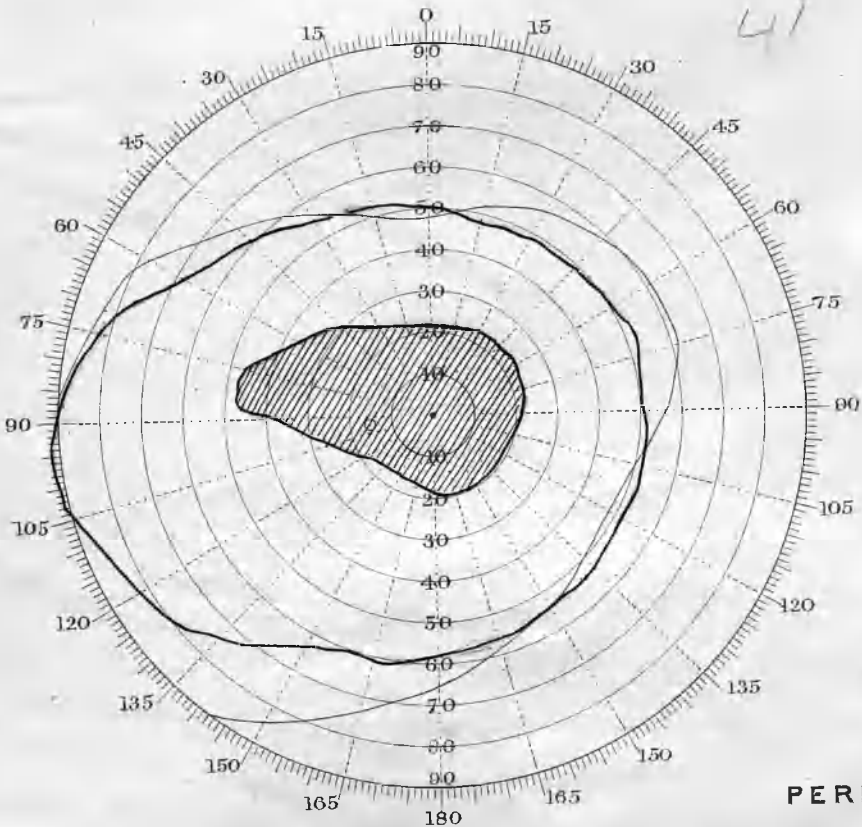
L.
6/60 under 20
Reads No. 20

R.
6/6
No. 1

Refraction + 2.0 M.

+ 1.0^D H.

*"Centre each chart with 'pointer' at Zero before
LEFT.*



PERIMETER

*The eccentric continuous red line indicates the average normal field
Designed for use with Prof. McHardy's Registering Perimeter.*


Clara Mitchell 11

28/5/89.

Internal Strabismus in R.

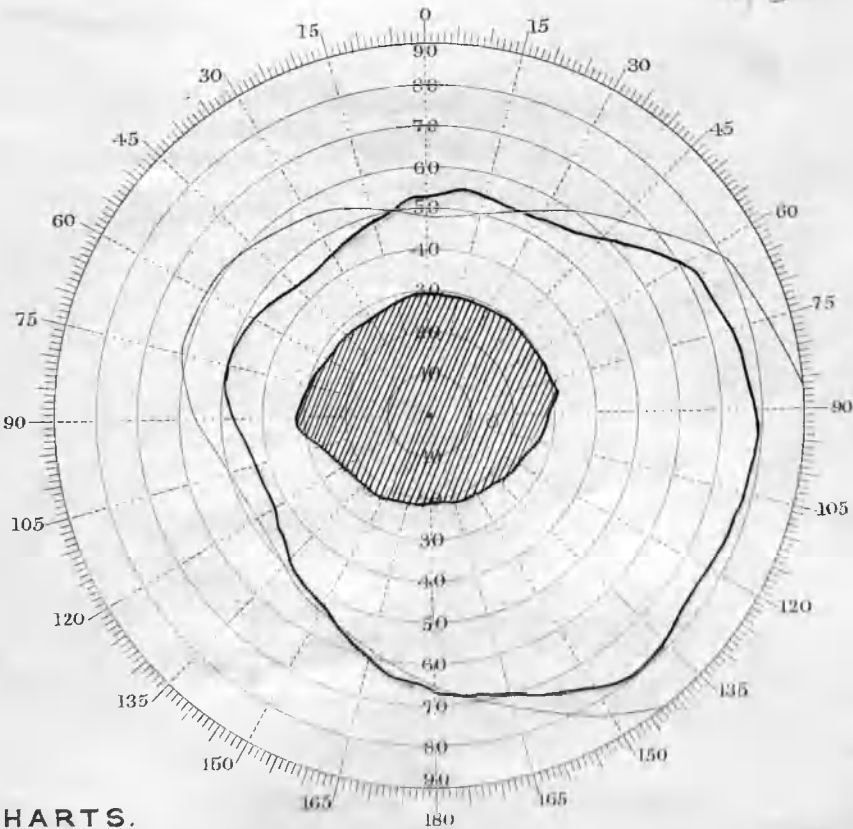
V. A. R. counts fingers only

L. No. 1 6/6.

Refraction + 5.0^D  1.0^D astig.

commencing to use the Automatic Registration.

RIGHT.



R CHARTS.

*of Indirect Vision, the small red circle the position of the blind spot.
Published by Mess^{rs} Curry & Puxton, 195, G¹ Portland St. London, W.*

Jeanie Kennedy 15

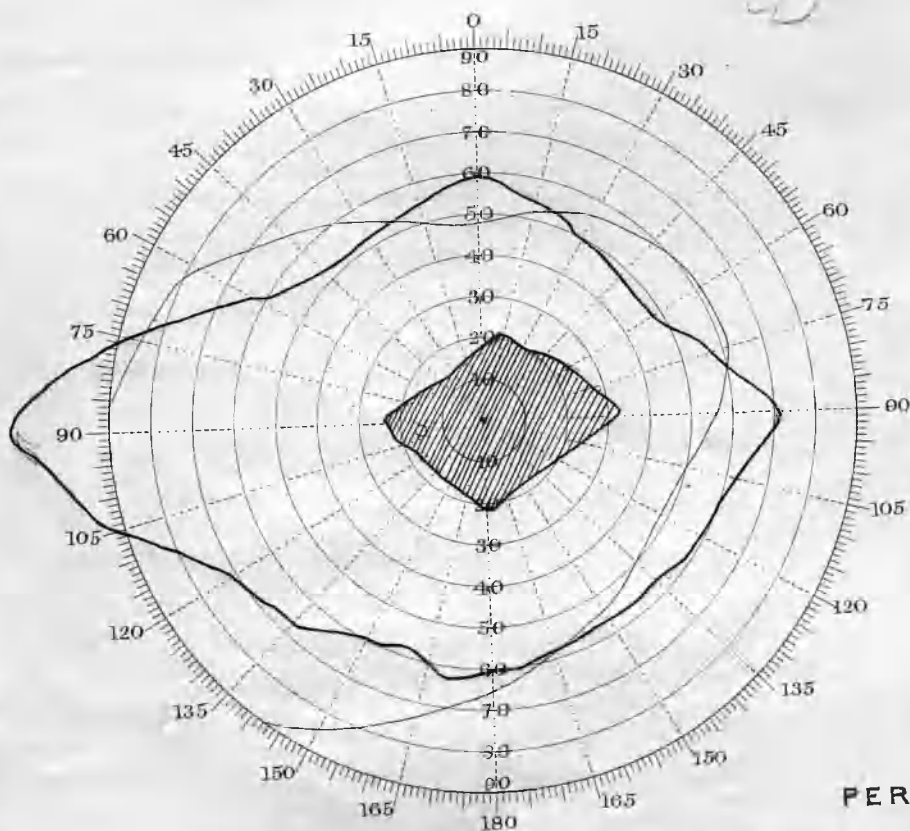
Oct.

Strab. in L. 6/60 under

Reads L. No. 20 = R. No. 1

Refraction + 2.0^D

Centre each chart with pointer at Zero before
LEFT.



*The eccentric continuous red line indicates the average normal field.
Designed for use with Prof. M. Hardy's Registering Perimeter.*

Alex. Blue 8

7th. May 1889.

Internal Strabismus in I. slight tendency to nystagmus.
 The squint was noticed when the patient was 3 years of age.
 Muscular Asthenopia has been complained of in the
 good eye.

V. A.

L.

No. 16

R.

No. 2

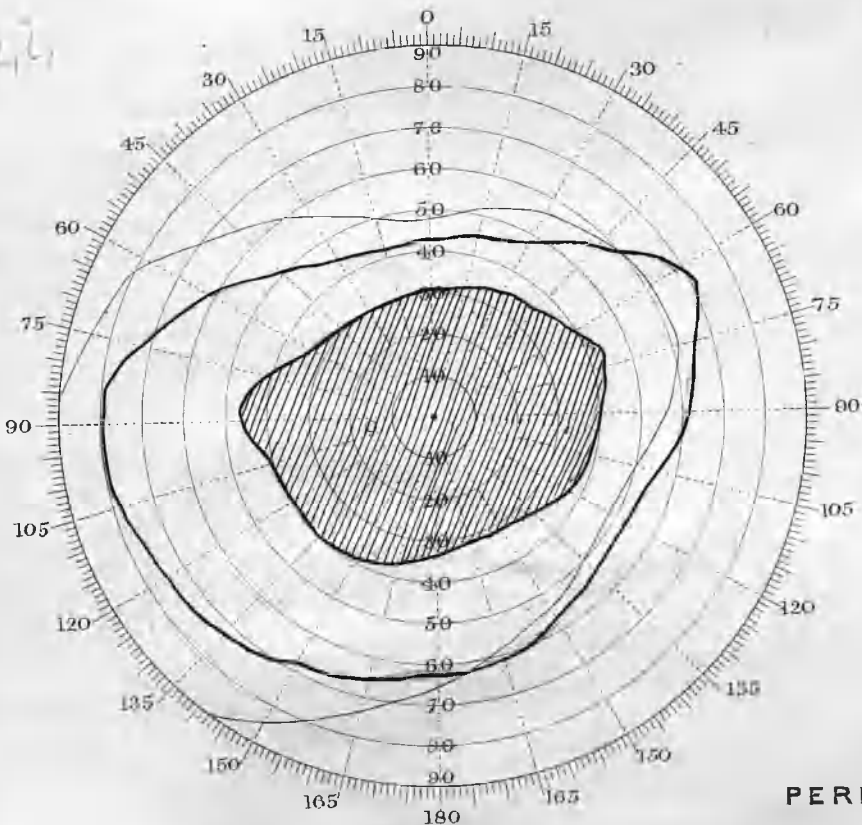
Refraction

+

4.0^D H.

Centre each chart with "pointer" at Zero before

LEFT.



*The eccentric continuous red line indicates the average normal field.
 Designed for use with Prof. M. Hardy's Registering Perimeter.*

R. McDonald 16

Alexandria

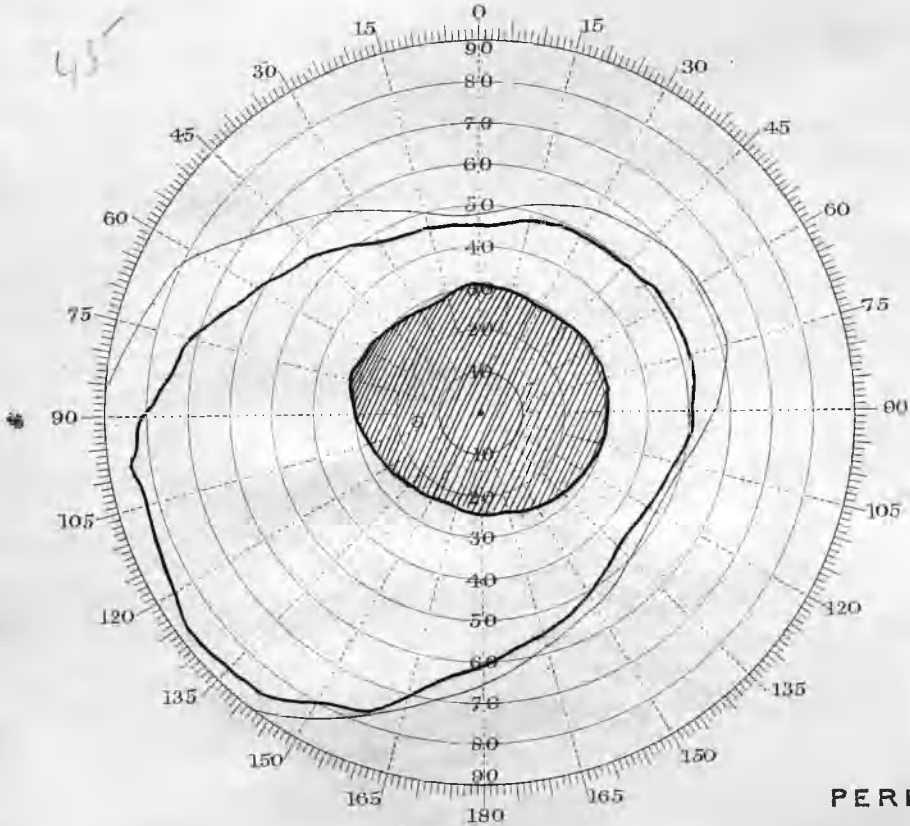
Internal Strabismus in L.

L. No. 20

R. No. 1

Refraction + 3.0^D

Centre each chart with "pointer" at Zero before
LEFT.



The eccentric continuous red line indicates the average normal field.
Designed for use with Prof. M. Hardy's Registering Perimeter.

Mrs. Dunn 25

Greenock

24/1/90.

Strabismus Convergens in L. Strabismus since childhood.

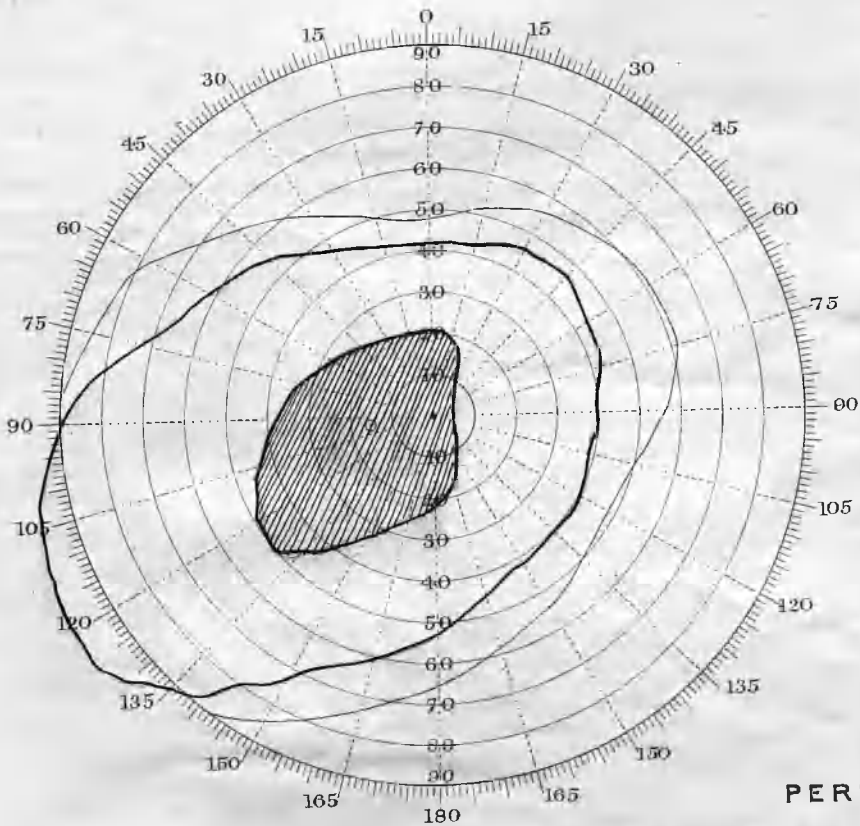
V. A. = R. - No. 1 L. = No. 20

Refraction + 2.0

Centre each chart with pointer at Zero before

LEFT.

40



PERIMETER

The eccentric continuous red line indicates the average normal field
Designed for use with Prof. M. Hardy's Registering Perimeter.

Bella King 20

11/8/88.

Strabismus Convergens in R. since childhood.

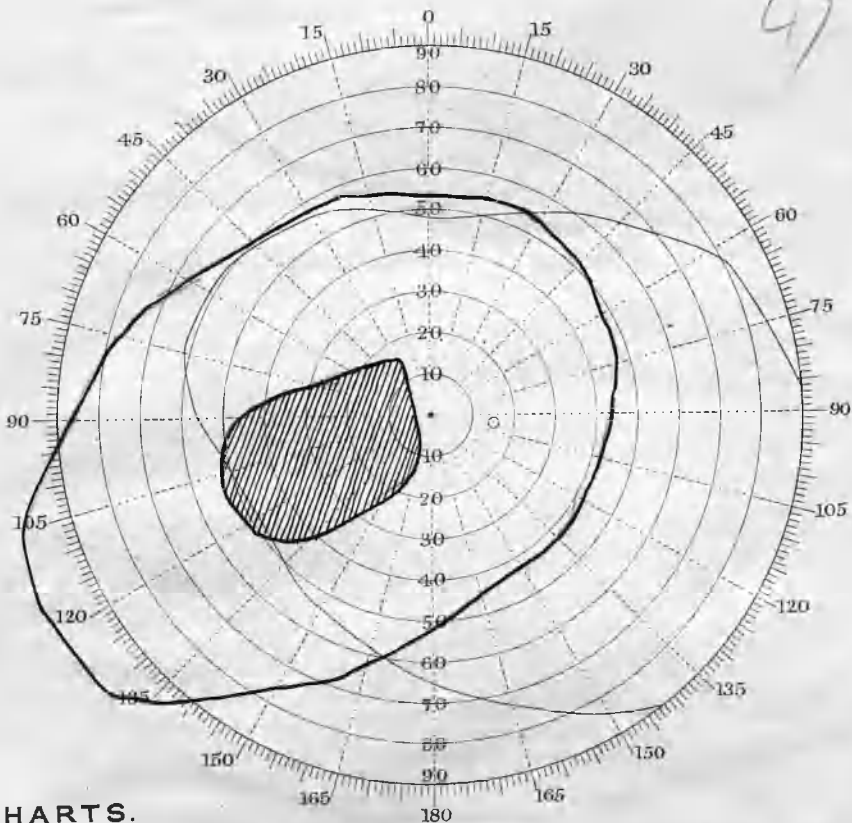
V. A.

R. = No. 20

L. = No. -6

Refraction $\pm 3.0^D$ *commencing to use the Automatic Registration.*

RIGHT.



R CHARTS.

Field of Indirect Vision: the small red circle the position of the blind spot.
 Published by Mess^{rs} Curry & Paxton, 195, Gt Portland St, London, W.

Amblyopia with Central Scotoma which could
not be limited by the perimeter.

W. Simpson 18

8/12/88.

Slight Strabismus Convergens in L.

Patient had strabismus from the age of 4.

V, A.

R. = No. 2

L. = No. 16

Refraction + 3.0^D

Scotoma roughly tested seemed considerable.

W. McCole 21

19/2/90.

Strabismus Convergens in R.

V, A.

R. = No. 20

L. = No. 1

Refraction + 2.0^D

Large central scotoma in R. not measure accurately.

Emily Beveridge 12

4/4/90.

Strabismus Convergens in L.

V, A.

R. = No. 1

L. = No. 20

Refraction + 4.0''

There was a central scotoma, patient could not wait to
have field taken.

Amblyopia with central scotoma which could not be limited
by the perimeter. Contd.

Ellen Robertson 9

26/2/90.

Strabismus Convergens in L.

V, A. R. = No. 1

L. = No. 20

Refraction + 6.0^D

Central Scotoma was not measured by perimeter.

Jane Sheilds 10

18/12/90.

Strabismus Convergens in L. Refraction + 5.0^D

V, A. R. = No. 1

L. No. 19

A central scotoma in left.

John Reid 8

5th. May 1896.

Strabismus Convergens in R.

V, A. R. = counts fingers only: Refraction +3.0^D

L. No.1 J. + 2.0^D

No vision in the centre, can see indistinctly at the
periphery of the field.

Amblyopia with central scotoma which could not be limited
by the perimeter. Contd.

M. Mair 14

12/12/88.

Strabismus Convergens in L.

V. A.

R. No. 1

L. No. 20

Refraction + 2.0^D

Central Scotoma in L.

Amblyopia.

Jessie Burtwell 15

28/2/90.

Strabismus Convergens in R.

L.

Reads No. 1 6/6

R.

under 6/60 No. 20

Refraction + 3.0^D

The patient was carefully tried to see if any central dimness. but could not be made out.

Geo. Ross 18

27/8/89.

Strabismus Convergens in R.

R.

V, A. No. 20 6/60

L.

+ 4.0^D H.

6/6 No. 1

Refraction + 6.0^D

No central defect could be made out by the perimeter although in reading the periphery of the field retained more vision than the central arm.

Amblyopia Contd.

John Robson 18

1890.

Internal Strabismus in L.

Refraction + 2.0 H

L. below No. 20 J.

R. No. 1 J.

Field was not taken eye too blind.


Jas. Provan 12

10/7/90.

Internal Strabismus in R.

V. A. R. No. 20

L. No. 2

Refraction + 3.0^D  1.50^D ast.

Field could not be taken, the boy said the middle was dim.

Mary Boyd 5

Largs

17/6/90.

Strabismus in R.

Refraction + 3.0^D

V. A.

R.

L.

No. 20 J.

No. I

Field of vision could not be taken.

Amblyopia Contd.

Jas. Walker 12

2/5/90.

Strabismus in R.

Refraction + 3.0^D

V. A.

L.

R.

No. I J.

No. 20 J.

Willie Houston 6 *

29/4/90

Strabismus Convergens in L.

Refraction + 3.0^D

V. A.

R. = No. I J.

L. = No. 20 J

The boy could not fix his eye sufficiently to have a field taken.

John Robin 18

30/4/90.

Strabismus Convergens in L.

Refraction + 3.0^D

V. A.

R. = No. I J.

L. No 20 below.

Field of vision could not be taken as the patient could not be got to fix his eye.

Amblyopia Contd.

Andrew Kelly 9

5/4/90.

Strabismus Convergens in L. Refraction + 2.0^D

V, A. L. = No. 20 J. below = R. = No. 1 J.

George Browning 9

Strabismus Convergens in R. Refraction + 3.50^D

V, A. R. = No. 20 J. below L. = No. 1 J. 6/6
No scotoma could be made out as the patient was too
amblyopic.

Jas. Gilchrist 10

26/2/90.

Strabismus Convergens in R. Refraction + 2.0^D

V, A. R. = No. 20 J. below L. = No. 1 J.
The field could not be taken.

Mary Agnew 9

6/5/90.

Convergens Strabismus in L. Refraction + 3.0^D

V, A. = R. No. 1 J. = L. No. 20 J.
+12'' brings the eyes almost straight.

Amblyopia Contd.

Thomas Scott 11

5/12/88.

Strabismus Convergens in L.

Refraction + 3.50^D

V. A. R. No. I J. 6/6 L. = counts fingers only
Left had a slight degree of strabismus was more marked
when patient was younger.

William Gilchrist 10

26/5/90

Strabismus Convergens in R.

Refraction + 2.0^D

V. A. R. = No. 20 6/60

L. = No. 1 6/6

William Wilson 15

26/10/89.

Strabismus Convergens in L.

Refraction + 6.0^D

V. A. R. No. 1 6/6

L. counts fingers with
difficulty.

Amblyopia Contd.

Jessie Scott 12

12/1/89.

Strabismus in R.

Refraction + 3.0^D

V. A.

R. No. 20 J. below.

L. No. 1 6/6

Patient could not fix eye so field of vision could not be taken.

Jas. Fulton 9

1890.

Extreme Strabismus Convergen in L.

Refraction + 2.50^D

V. A. R. = No. I J. 6/6

L. below 6/60 No. 20

No field could be taken.

Mary Wood 9

Strabismus Convergens in L. for 6 months.

Refraction + 2.0^D

V. A. R. = No. 1 6/6

L. = fingers only.

Amblyopia Contd.

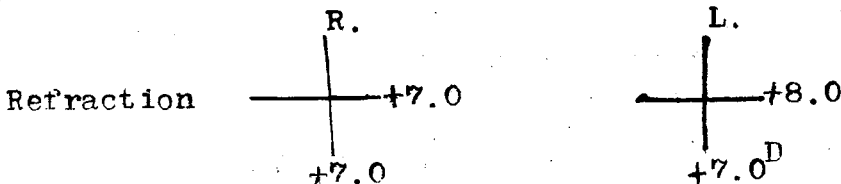
William Gates 10

7/7/96

Strabismus Alterans worse in L.

Mother states that the boy has squinted since he was 18 months old.

V. A. R. = No. I J. 6/6 L. = below No. 20 J.6/60

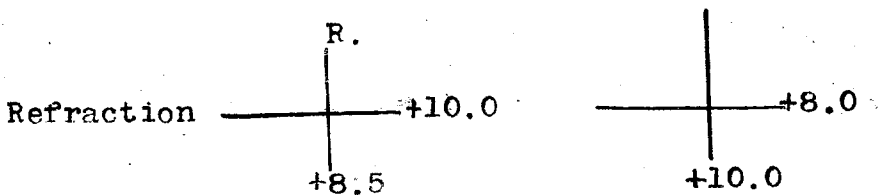


William Campbell 11

7/7/96.

Strab. Convergen in R.

V. A. R. = No. 20 J. not 6/60 L. = No. 12 J.6/30

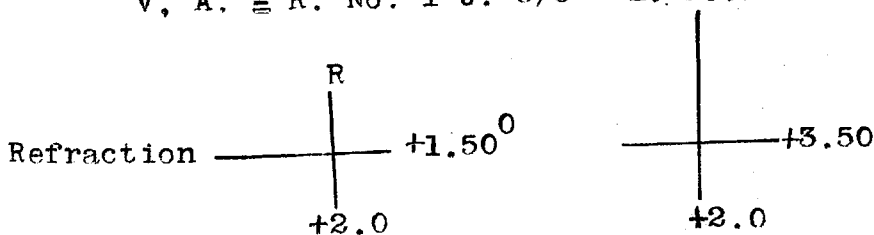


Alex. Murray 7

10/7/96.

Strabismus in L. for 3 years duration.

V. A. = R. No. 1 J. 6/6 L. No. 20 not 6/60



Amblyopia Contd.

David Shields 12

4th. July 1896.

A very pronounced strabismus in R., has squinted since he was 3 years of age.

Refraction + 2.0D

V. A. R. = fingers only L. = No. I J. 6/6

Mary Glanster 6

Strabismus Convergens in L.

Mother states that the squint has only been present for a year.

V. A.

R. = No. I J. 6/6

L. = No. 20 6/60

Refraction + 6.0

+ 7.0

Amblyopia less pronounced.

Joseph Wright 11

21/8/88

Strabismus Convergen in L.

Refraction + 2.50^D

V, A. R. = No. I J. 6/6 L. = No. 14 J.
Field very much contracted no central scotoma.

David McNicol 8

27/5/89

Strabismus Convergens in L.

Refraction + 3.0^D



V, A. R. = No. I J. = L. = No. 16 J.

Agnes McAulay 13

19th. June 1889.

Strabismus Convergens in R.

V, A. R. = No. 16 J. L. = No. 12 J.

Refraction + 4.0  + 0.50^D astig. + 5.0  + 1.0^D astig.

Amblyopia less pronounced Contd.

Frank Collins 9

14/6/90.

Strabismus Convergens in R.

Refraction + 2.50^D

V, A. R. = No. 16

L. = No. I.

Agnes Fulton 9

24/1/90

Strabismus Convergens in L.

Refraction + 2.0^D

V, A. R. = No. 1 = 6/6

L. No. 16 6/36

Jessie Hepburn 12

Strabismus Convergens in L.

Refraction + 2.0^D

V, A. R. No. 1 6/6

L. No. 16 6/36.

Amblyopia less pronounced Contd.

John Huggins 8

7th. July 1896.

Strabismus in R. has been present for 6 years.

V. A. R. = No. 14 J. 6/36 L. = No 4 6/18

Refraction $\begin{array}{c} | \\ \hline +8.0 \\ \hline +5.50 \end{array}$

$\begin{array}{c} | \\ \hline +8.0 \\ \hline +6.0 \end{array}$

Mary McDonald 18

7th. Oct. 1889.

Strabismus Convergen in R.

Refraction + 2.0

V. A.

L. No. 1

R. No. 16

Slight degree of Amblyopia.

Janet Leiper 11

4th. August 1896.

Strabismus in R.

Refraction + 3.0^D

The strabismus has been present only for two years.

V, A. R. = No. 8 6/36 L. = No. 2 6/12.

Jas. McFarlane 10

10th. July 1896.

Strabismus in R. The strabismus has been present since he was 3 years of age.

V, A. R. = No. 8 6/36

L. No. 2 6/9

 Refraction $\begin{array}{c} // \\ // \end{array} \begin{array}{c} + \\ + \end{array} \begin{array}{c} \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \end{array} \begin{array}{c} +8.0^D \\ +7.50 \end{array}$
 $\begin{array}{c} \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \end{array} \begin{array}{c} +6.50 \\ +7.50 \end{array}$

Lizzie Morton 12

1889.

Strabismus Convergens in L.

Refraction + 3.0^D

V, A. R. = No. I J.

L. No. 6 J.

Slight degree of Amblyopia Contd.

Bella McIntosh 6

Strabismus Convergens in R.

Refraction + 3.0^D

V. A. R. = No. 8

L. = No. 1.

George Hay 6

22/3/90.

Strabismus in R.

Refraction + 4.0^D

V. A. = R. = No. 4

L. = No. 2

Very Slight Degree of Amblyopia.

 Matthew Baxter 8

24/6/90.

Strabismus Convergens in L.

Refraction + 3.0^D

V, A. R. = No. 1

L. = No. 2.

 Mary Thomson 7

6/5/90.

Strabismus Convergens in R.

Refraction + 2.0^D

V, A. R. = No. 2

L. = No. 2

 Robert Scott 18

5/4/90.

Strabismus Convergens in L.

Refraction + 2.0^D

V, A. R. = No. I.

L. = No. 2

 Helen McDiarmid 8

15/4/90.

Strabismus Convergens in R.

Refraction + 2.0^D

V, A. R. = No. 2

L. = No. 2

Vision Normal.

Edward Dawson 14

16/4/90.

Strabismus Convergen in R.

Refraction + 2.0^D

V, A. R. - No. 1 6/6

L. - No. 1 6/6

Norman McAulay 10

Strabismus Convergens in L.

Refraction + 1.50^D

V, A. R. = No. 1 6/6

L. = No. 1 6/6

Marion Galt 17

5/3/90.

Strabismus Convergens in R.

Refraction + 5.0^D

V, A. = R. = No. 1 6/6

L. = No. 1 6/6

Maggie McNaught 8

17/3/90.

Marked strabismus in R.

Refraction + 2.0^D

V, A. R. - No. 1 6/6


L. - No. 1 6/6

Vision Normal Contd.

Maggie Bell 12

8/3/90.

Strabismus Convergens in L.

Refraction + 4.0^D  + 1.0^D astig.

V. A. R. = No. 1 6/6

L. = No. 1 6/6

Ann Stevenson 12

5/3/90.

Marked strabismus in L.

Refraction + 2.0

V. A. R. = No. 1 6/6

L. = No. 1 6/6.

Lizzie Morton 12

28/1/90.

Strabismus Convergens Alterans.

Refraction + 3.0^D

V. A. R. = No. 1 6/6

L. = No. 1 6/6

Jas. Johnstone 20

25/3/89.

Strabismus Convergens in L.

Refraction + 3.0^D

V. A. R. = No. 1 6/6

L. = No. 1 6/6

Vision Normal Contd.

Ellen Noble 10

27/2/90.

Marked strabismus in R.

Refraction + 2.0^D

V, A. R. = No. 1 6/6

L. = No. 1 6/6.

Mary Thom 11

14th. August 1896.

Strabismus Convergens Alterans.

Refraction + 1.50

V, A. R. = 6/6

L. = 6/6

Jas. Scott 12

Strabismus Convergens in R.

Refraction + 2.0^D

V, A. R. = No. 1 6/6

L. = No. 1 6/6

R. Finney 9

30/7/90.

Strabismus Convergens in R.

Refraction + 4.0^D

V, A. R. = No. 1 6/6

L. = No. 1 6/6

Vision Normal Contd.

David Scobie 11

July 1896.

Strabismus Convergens Alterans

Refraction + 2.0

V. A. R. = No. 1 6/6

L. = No. 1 6/6

Lizzie Martin 6

July 1896.

Strabismus Convergens Alterans

V. A. R. = No. 1

L. = No. 1

Refraction $\begin{array}{c} | \\ \text{---} +7.0 \\ | \\ +5.0 \end{array}$

$\begin{array}{c} | \\ \text{---} +7.5 \\ | \\ +5.0 \end{array}$

Mary Louden 5

Strabismus Convergens Alterans of one year's duration.

V. A. R. = No. 1 6/6

L. = No. 1 6/6

Refraction $\begin{array}{c} | \\ \text{---} +6.0 \\ | \\ +7.0 \end{array}$

$\begin{array}{c} | \\ \text{---} +6.0 \\ | \\ +7.0 \end{array}$

Vision Normal Contd.

Jessie Gibsons 15

July 1896.

Strabismus Convergens Alterans

Refraction + 3.50^D

V. A. R. = No. 1 6/6

L. = No. 1 6/6

Glasses ordered by Dr. W. R. four years ago.

Isa Gray 7

Strabismus Convergens Alterans

Refraction + 1.75^D

V. A. R. = No. 1 J. 6/6

L. = No. 1 J. 6/6

Squint has been present for 3 years.

Neuritis.

Jas. Pringle 22

28/3/89.

Strabismus Convergens in R.

V. A. L. = No. 6 = R. = No. 20

Refraction + 2.0

Distinct optic Neuritis strabismus of long standing.

Neuritis in Strabismus.

Thomas Ferguson 14

13/1/90.

Strabismus Convergens in L.

V, A.

R. No. 6

L. fingers only.

Refraction + 6.0^D

Mother states that she has noticed the squint since infancy.

About a fortnight ago from the above date complained of
severe frontal headache.

Distinct optic Neuritis in L.

91

Age.

Maggie Fullerton Beath 4

22/11/88.

Marked degree of Strabismus in L.

Refraction + 3.0 retinoscope

V, A. child cannot read.

Age.

Lizzie Sprott 3

10/4/90,

Marked Strabismus Convergens in R.

V. A. child cannot read.

Refraction + 5.0 retinoscope.

From a study of the cases it appears that amblyopia is not caused by the squint but rather amblyopia is a cause of the squint. No doubt when the ametropia is Hypermetropic the extra convergence which the Hypermetrope requires to bring into play and keep up, especially for near vision, /and even for distant vision/ the old explanation that one of the muscles becomes worn out and gives way producing the strabismus. The reason for one muscle giving way before the other was said to be due to an insufficiency of that particular muscle. And, by the image not falling on the same part corresponding to the retina of the other eye, diplopia was brought about and that by time the image in the squinting eye was suppressed amblyopia ex anopsia.

But this is an explanation which I cannot agree with. It appears to me, how the strabismus is determined to one eye more than the other, that in one eye the power of fixation is much lower or if not altogether absent, hence there is no steadying of the eye by a sharp image on the retina. And as the convergence and accommodation are co-ordinate movements and when the extra straining

brought about by the Hypermetropia of the eye, the eye, which is not fixed naturally to relieve this strain, becomes affected, and on examining patients carefully I never could learn that they suffered at any time from diplopia: in paralytic squint this is generally the first and most distressing symptom complained of. And, likewise, when the vision is normal it generally remains so, one eye is used indifferently for fixing bringing about Strabismus Alterans.

From this series of cases, in 17 vision was normal in either eye, 6/6, and 7 of those the strabismus was alterous leaving only 11 cases in which the strabismus was permanent in one eye.

In correcting the strabismus in many cases of normal vision it is only necessary to put the patient on atropine for a week or two then carefully to measure the eye, and in this correction the greatest benefit is in accurately estimating the amount of ametropia, especially, by retinoscopy and in ordering a little less than the static refraction; in majority of instances this is all

that is needed.

In one of my cases in which the vision was normal, where it was found necessary to divide the tendon of the internal rectus, a troublesome diplopia was brought about but which disappeared by keeping the eye under atropine for some time.

I make a rule now never to divide the internal rectus when vision is normal, for by correcting the ametropia and keeping the squinting eye under atropine for some time, it is my opinion, that the strabismus will disappear without operation. In those cases in which the vision is normal, a large proportion are brought about by imitation, a boy who is hypermetropic imitates the squint in a companion, he is astonished to find that he sees more distinctly with the one eye, so when he wants to see clearly he voluntarily squints and the habit becomes fixed, but he may use either eye alternately, and as far as I have been able to make out in the nine years I have taken notes of cases of squint, he will never turn amblyopic.

It was likewise advanced in cases of amblyopia, amblyopia ex anopsia, caused by want of use, by correcting the squint by operation and ordering suitable glasses the amblyopia would be reduced.

In many of my cases which I have kept under observation this result was not accomplished, of course, the large majority do not report themselves after the operation and glasses have been prescribed. In one case, which I kept under observation for two years, the improvement was so slight as to discourage one in persevering in the following treatment:-

J. O. 12 Possilpark Oct. 1893.

was sent to me for a squint which the mother said had been present for 9 years.

V. A. R. No. 1 6/6 L. under 6/60 counts fingers with difficulty no changes in the fundus, was put under atropine + 3.0.

Left eye was operated on and kept under atropine for 2 months, he was told to keep the good eye bandaged for half an hour at night and endeavour to read, in carrying out

these instructions at the end of two years he could read No. 19 Jaeger, the letters in the middle were indistinct, clearer at the sides. The treatment was then given up as unsatisfactory.

This is the only case in which I know any improvement followed operation. But it is common for eyes affected strabismus to come straight, and the person not to be aware of any deficiency of sight till it is found out accidentally. In the first part I have noticed this as a common disqualification to intending candidates for the army, when on examination the story of a squint in childhood is elicited.

Before proceeding farther, I would like to state that after the operation for tenotomy which has been described in the first part, if glasses do not bring the eye straight, as they seldom do, when we have amblyopia and in no case which I have seen when we have a decided central scotoma, in those cases of scotoma it has been my practice to make the section of the tendon as free as possible, it is generally

stated we should be governed by the amount of hypermetropia in making our section of the muscle. But it has been my practice to be guided entirely by the amount of amblyopia and especially by the presence of the scotoma.

And in estimating the amount of ametropia in the good eye the manifest hypermetropia is only corrected, and if any astigmatism is present to order what the patient sees best with, without being under atropine. In the squinting eye the whole or static refraction is ordered, and in the case of astigmatism I estimate the amount under atropine and order from this correction.

In all cases where the amblyopia is not great, the manifest hypermetropia is ordered for both eyes: in all cases of squint, when I can get the patient to submit, it is a rule always to have the eye affected with strabismus under atropine for a month after the glasses are ordered.

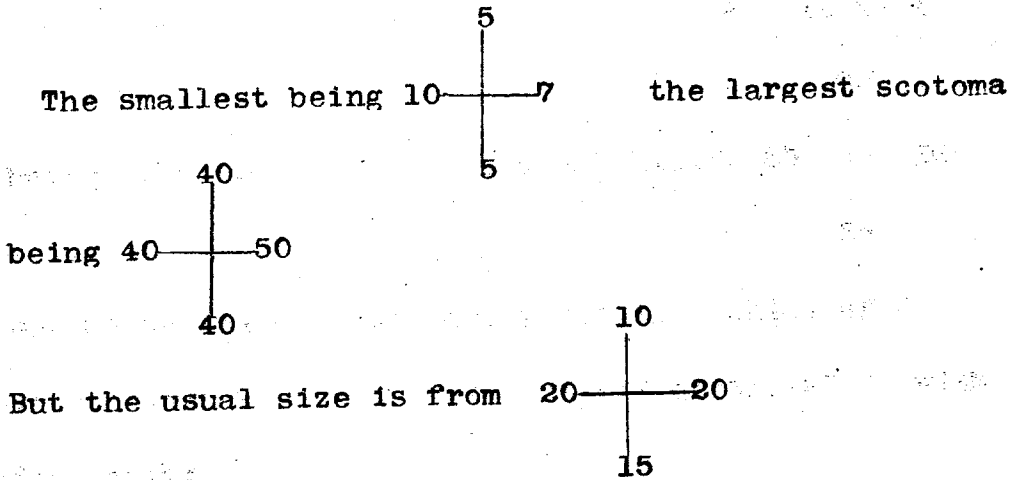
Central Scotoma.

Those cases are not selected but are taken from the clinic of the Eye Infirmary and private practice; I have excluded nebulae on cornea, opacity on the lens, and pathological conditions of the fundus.

In the 47 fields of vision 33 are contracted; the fields represented by the Nos., 5, 6, 7, and 33, are much lessened. The other fields represented by the Nos. 11, 16, 17, 23, 34, 35, and 38, are so much contracted they would naturally suggest some organic lesion, by the most careful examination nothing abnormal could be detected. The explanation which I would offer is that the periphery of the field possibly suffers from the same condition as affects the centre, but to a less degree.

With reference to the scotomata, with two exceptions they are distinctly central. In case 46 the scotoma just crossed the centre of the field about 5° towards the nasal side; on the temporal side it extends out

as far as 50° . The other case 47: the scotoma does come out to the middle but stops 5° from the centre; in this case pigment in macular seemed to have undergone a change but no definite choroiditis could be recognised. In all the other 45 cases the scotomata were distinctly central.

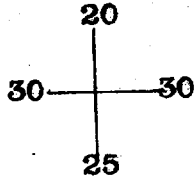


The other variations will be found in the annexed table.

In no case was this scotoma found to be reduced in size by treatment, possibly the cases were not long enough under observation. In one case only was the amblyopia reduced; this case has been given in another section.

The age at which this scotoma occurs at is difficult to say, two patients came with well marked strabismus at the ages of 3 and 4, but as they could not read no information could be got as to the presence of a scotoma.

The youngest in which a definite scotoma has been made out is 7 years, in case No. 4; it is a

well marked scotoma of the usual limits  20
30—30
25

but we have a distinct amblyopia in a child of 5 years, only recognised the letters of No. 20 J. with difficulty.

The refraction of Table I shows that most of those who have strabismus have a low degree of hypermetropia $+2.0 = 23$. $+3.0 = 12 =$ higher degree of refractive errors are not common, we have one of $+9.0 =$

In all the five tables the low degree of hypermetropia are the most common. But this condition applies to all hypermetropes not affected with strabismus,

+2.0, +3.0, are the degrees representing the great majority of hypermetropes. We have had only case of anisometropia and case of myopia.

In all cases there are only 7 cases of astigmatism representing a + 0.50^D up to + 2.0^D

From what data I have given, in my opinion, the cause of strabismus is the central scotoma. At the early age of seven we have a distinct one, and from the fact that after an operation and proper glasses prescribed they are no improvement, seems to me as if the defect was congenital and incurable.

Hypermetropia may tend to bring about the deviation, but in the 5th. table we have 17 cases of strabismus in which vision is normal, how did the strabismus not bring on what is known as amblyopia ex anopsia.?

Some of the patients have had the squint for many years, yet with either the vision was 6/6. And further we have in this class the alternating squint in which he can use either eye at pleasure, with perfect vision. In this table we have 17 cases, and 7 cases are examples

of strabismus alterans.

/In my 14 cases two cases are affected with neuritis, the history points in both instances to slight injuries which are not commonly followed in healthy eyes by inflammation/.

The want of fixation, caused by the central defect, is what brings about the majority of squints.

We will not take the last 4 = so we have 110

Amblyopia

93

17

So we have only the 17 in which vision is normal, the other 93 all having an amblyopia which appears to be congenital.

Scotoma.

Table I.

Age	Sex	Refraction	Amblyopia	Scotomata	
				Vertical	Horizontal
				5	
				1 = 1	
				5	
				10	10 - 5 = 1
				1 = 7	
7 = 1				10	10 - 10 = 1
				10	
				1 = 2	10 - 20 = 2
8 = 2				15	
				10	15 - 15 = 1
				1 = 3	
9 = 6				20	15 - 20 = 2
				15	
10 = 4				1 = 7	20 - 10 = 1
				15	
11 = 1				15	20 - 20 = 18
				1 = 1	
12 = 7				25	20 - 25 = 1
				20	
13 = 2				1 = 1	20 - 30 = 3
				20	
14 = 2				20	20 - 40 = 1
				1 = 1	
15 = 3				25	25 - 25 = 2
				20	
16 = 2				1 = 1	25 - 30 = 1
				30	
17 = 2				25	30 - 20 = 1
				1 = 1	
18 = 1				25	

Scotoma, Table I. Contd.

Age	Sex	Refraction	Amblyopia	Scotomata	
				{ Vertical	Horizontal }
19 = 6		Anisometropia			30 - 25 = 1
20 = 1		-2.0 = 1		25	
		+1.0		1 = 1	30 - 30 = 4
21 = 1		+2.0 = 23		30	
				<u>30</u>	30 - 35 = 1
22 = 2		+2.50 = 3	Reads	1 = 1	
			No. 16 J = 4	<u>20</u>	30 - 40 = 1
24 = 1		+3.0 = 12		30	
			18 J = 4	1 = 1	30 - 45 = 1
26 = 1		+4.0 = 4		<u>25</u>	
			20 J = 35	30	35 - 40 = 1
34 = 1	B 22	+5.0 = 2		1 = 3	
			Under	<u>30</u>	40 - 45 = 1
39 = 1	G 25	+9.0 = 1	No. 20 J = 4	40	
				1 = 1	40 - 50 = 1
				<u>40</u>	

47

47

47

47

47

47

Left 29
Right 18

47

Central Scotoma, present field could not be taken.

II.

Age	Sex	Refraction	Amblyopia	R.	L.
18 = 1					
21 = 1		+3.0 = 2			
12 = 1		+2.0 = 1	No. = 16 = 1		
9 = 1		+4.0 = 1	No. = 19 = 1		
10 = 1	B = 3	+5.0 = 1	No. = 20 = 3		
8 = 1	G = 3	+6.0 = 1	under- 20 = 1	2	4
<hr/>			<hr/>		
6	6	6	6	6	

Amblyopia.

III

Age	Sex	Refraction	Amblyopia
5 = 1		+2.0 = 6	
6 = 2		+2.50 = 1	
7 = 1		+3.0 = 8	
9 = 5		+3.50 = 2	
10 = 3		+6.0 = 2	
11 = 2		+7.0 = 1	
12 = 4		+8.0 = 1	No.20 = 8 R. 9
15 = 2	G. = 6	R. +8.50 L. +10.0 +10.0 +8.0 = 1	under No.20 = 15 L.14
18 = 3	B. = 17	R. +1.50 L. +3.50 2.0 +2.0	
23	23	23	23 23

Amblyopia less.

IV.

Age	Sex	Refraction	Amblyopia	R. L.
6 = 2				
7 = 1		+2.0 = 6	No. 2.J. = 4	
8 = 4		+2.50 = 3	No. 4 = 1	
9 = 2		+3.0 = 4	No. 6 = 1	
10 = 2		+4.0 = 1	No. 8 = 3	
11 = 2		+4.0 \odot + 0.50 ast. = 1	No. 12 = 1	R 12
12 = 2	G.9	+8.0 \odot + 1.0 ast. = 1	No. 14 = 2	L 5
18 = 2	B.8	+8.0 \odot + 2.0 ast. = 1	No. 16 = 5	
17	17	17	17	17

Vision Normal.

V.

Age	Sex	Refraction	R.	L.
5 = 1				
6 = 1				
7 = 1				
8 = 1				
9 = 1				
10 = 1		+1.50 = 3		
11 = 2		+2.0 = 6		
12 = 4		+3.0 = 2		
14 = 1		+3.50 = 1		
15 = 1		+4.0 = 2		
17 = 1		+5.0 = 1		L 5
19 - 1	G 6	+5.0 \ominus +2.0 ast. = 1		R 5
20 - 1	B 11	+6.0 \ominus +1.0 ast. = 1	alterans	7
-----	-----	-----	-----	-----
17	17	17		17

Fields taken in Scotomata present	47
Fields could not be taken	6
Amblyopia	23
Amblyopia less	17
Vision Normal	17
Taken for the sake of age 3, 4	2
Neuritis present	2

124
