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A STATISTICAL ANALYSIS OF PERSONS CERTIFIED BLIND IN SCOTLAND*

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A STATISTICAL analysis of 3,219 persons certified blind at the Regional Clinic for Glasgow and South-West Scotland was published in the *Brit. J. of Ophthal.* in 1942 by John Marshall and H. E. Seiler¹.

The present analysis relates to the rest of Scotland, comprising the regional clinics for Edinburgh, Dundee, Dumfries; Aberdeen and Inverness for the period November, 1930, to the end of 1938. During that period a total of 5,953 persons were examined by ophthalmologists and 4,078 or 68.5 per cent. were certified blind within the meaning of the Blind Persons Act.

The definition of blindness is the same for the whole of Scotland and is based on visual standards. The standard is divided into 3 categories, *viz* :—

Group I. Visual acuity of less than 3/60 Snellen. Regarded as blind.

Group II. Visual acuity of 6/60 Snellen or better. Not regarded as blind unless the field of vision is contracted to 10 degrees or less throughout the greater part of its extent and particularly in the lower part of the field.

* Received for publication, January, 1946.

Group III. Intermediate degrees of visual acuity, *i.e.*, 3/60 Snellen but less than 6/60. Regarded as blind—(a) When the visual defect is associated with a restricted field of vision although it exceeds the limit of 10 degrees laid down in Group II. (b) If aphakic.

The form of medical certificate recommended by the Department of Health for Scotland is used at all regional clinics, and all cases were examined by two ophthalmologists.

A scrutiny of the certificates of blindness was made to ensure that the diagnosis and causes of eye defects found had been entered in accordance with the nomenclature on the certificate, and to verify as far as possible the age of onset of eye trouble and the age of onset of blindness.

This scrutiny revealed that the Wassermann test for syphilis had been employed in selected cases only, and it has therefore been excluded from the tables. The family history has also been omitted as the records were too scanty to be of any statistical value. The recording of different examiners was made to a uniform standard and the code numbers were transcribed from the certificates on to sheets in preparation for machine card recording. The preliminary survey to this point was completed in 1939 but owing to the war it was not found possible to proceed until now. The subsequent compilation of the statistical tables has been carried out on Powers' machines by the Department of Health for Scotland.

The number of certified blind persons dealt with in the present investigation reinforced by Marshall and Seiler's figures is 7,297 but this does not cover the whole population, and it is difficult to obtain authoritative information on the total extent of blindness in the country.

Enquiry has been made of the Associations for Teaching the Blind and the consensus of opinion seems to be that about 2 per cent. of blind persons belong to the higher social groups and have not applied for pension or other form of special assistance.

On March 31, 1935, there were 8,332 blind persons on the registers of the local authorities, and the discrepancy is attributed to the following difficulties experienced in the scrutiny of medical certificates.

A large number of certificates related to persons who were not blind. Re-examination forms were commonly not attached to the original certificates and if blindness supervened there was not sufficient information on the re-examination form for classification. In a considerable number of the earlier certificates the information was so meagre that they could not be included in the survey. A further consideration of importance regarding the total number of the blind is the considerable lag in registering blindness which frequently occurs, *e.g.*, Blindness is recorded for 420 persons in the

age group 0—under 1, but only one case was registered as blind at that age.

This lag occurs up to the age group 16-29 and below this group few people appear to register at the onset of blindness.

Out of the total of 4,078 for the rest of Scotland, 612 cases stated they were blind before the age of 16 years, but blindness at ages under 16 on the register amounts to only slightly over 100 cases.

The 50-64 group shows the number of persons blind and on the register as about the same as the number who stated they became blind in this age range, and nearly all the lag is made up in the age group 65 and over.

Speculation about the causes of this lag in registration suggests that while there may be an element of exaggeration in the claims as to the date of onset of blindness this is not the main cause of the apparent deferment in registration. Economic considerations no doubt largely explain the lag because many blind persons only register to obtain the monetary benefits derived after registering when a worsening of their financial circumstances or deterioration in health make this course necessary. It is not without significance that the lag in registration is only made up when pensionable ages are reached. It is thought therefore that the tables showing the alleged age at onset of blindness provide the best clue to the number of persons actually blind at these ages.

It seems that roughly one in eight blind persons do not register at the time of blindness, and in estimating the total blindness in Scotland fully 1,000 would have to be added to the 8,332 on the registers. It may be assumed therefore that the total number of blind persons between the years 1932 and 1939, including the higher social groups, is between 9,500 and 10,000.

Assuming the same incidence of blindness in the populations of England, Wales and Northern Ireland and without making any allowance for the different age and sex constitutions of these populations compared with Scotland, the number of blind persons in the United Kingdom may be estimated approximately at between 80,000 and 90,000.

A recent estimation by Sorsby for England and Wales puts the total at not less than 80,000 and unlikely to exceed 100,000².

A point of importance bearing on the accuracy of the tables as reflecting the age distribution of blindness in Scotland is the period covered by the investigation which represents about 8 years. During that time new entrants to the register were brought into the review but persons going off the register were not included. Since death is the main reason for ceasing to be a registered blind person it will be obvious that an influence selective of the younger ages has been operating. To an extent, which, however, it is impossible to assess, certain tables such as that showing the

distribution of present ages, will be more seriously affected than others. Though the data presented here do not therefore represent an accurate cross section of the blind population at any one time most of the tables are relatively unaffected by the age selective element in sampling, and it is considered that they may be used to show the relative importance of age, cause and condition in the blind state. Guidance of the future course of recording and analyses answering questions bearing on the prevention and treatment of blindness are also unaffected.

The chief value of a statistical analysis of the blind is the insight it gives into the study of prevention of blindness, and for this purpose records of monocular blindness would be of great importance. On practical grounds it is appreciated that difficulties exist in making blindness, whether monocular or total, a notifiable disease. Information on the extent of monocular blindness, particularly of the traumatic type whether industrial or otherwise, might be available from the certificates of incapacity for work granted to insured persons and contained in the records of approved societies. An attempt is being made to obtain information from that source.

Marshall and Seiler have discussed very fully the results of their analysis of the cases covered by their investigation, and the figures for the rest of Scotland confirm largely what has been brought out by them. To avoid repetition only comments are given on the tables now published and an explanation of some of the differences in the figures has been suggested.

In order to simplify comparison of the results of this analysis with the figures for Glasgow and South-West Scotland, reference in parenthesis is given at the head of each table to the relevant figures in the Glasgow report.

The aim has been to present an analysis for Scotland by supplementing that already made by Marshall and Seiler for Glasgow and the South-West. In the absence of data always comparable between the two investigations it has not been possible in every case to keep the tables published now for the rest of Scotland in line with those for Glasgow and the South-West. This object, however, has been kept in view and certain tables have been amalgamated to present now for the first time as complete a record as possible of the blind position in Scotland.

It would seem that the difficulties mentioned could be overcome by the adoption of a simple scheme based on the records of local authorities.

A central register was kept in the Department of Health until about the year 1929. If this register were re-established the Statutory Department might in future publish annual statistics showing the number of registered blind at different ages, the cause

of blindness, the age at onset for the different causes and the age at death. It is suggested that 5 yearly age groups should be adopted, and further subdivision may be found desirable, *e.g.*, to separate infancy, pre-school and school years from the adolescent stage. Further details such as school education, training and occupation, would simplify the application of the Prevention and Treatment of Blindness (Scotland) Act.

TABLE 1. (III and IV)

*Age and sex distribution at onset of eye trouble
and at onset of blindness.*

"Eye Trouble" means the condition which led to blindness. Females are slightly in excess of males, the difference being only 0.58 per cent.

Blindness occurred at 50 years and over in 55.8 per cent., and the age of onset of the condition causing blindness was under that age in 63.5 per cent.

It will be noted that the higher age groups are 50-64 and 65 plus compared with the Glasgow subdivision into 50-59, 60-69, 70 and over.

TABLE I (III & IV)

AGE AND SEX DISTRIBUTION AT ONSET OF EYE TROUBLE
ONSET OF BLINDNESS AND PRESENT

Age Group	Number of Persons in Group at					
	Onset Eye Trouble		Onset Blindness		Present Age	
	Male	Female	Male	Female	Male	Female
Under 1	291	272	130	134	—	—
1 - 4	152	188	47	54	17	16
5 - 15	312	377	148	99	57	32
16 - 29	221	146	245	164	179	120
30 - 39	159	119	174	130	152	143
40 - 49	185	170	243	234	255	188
50 - 64	392	406	562	645	649	658
65 +	303	385	466	603	706	906
Totals	2015	2063	2015	2063	2015	2063

TABLE 2. (VI, VII, B Appendix)

Causes of blindness second eye: at present age.

An excerpt of the more important causes is given below to show the general agreement with the Glasgow figures.

	Rest of Scotland Cases	Per cent.	Glasgow Per cent.
Cataract	706	17.3	16.77
Myopia	563	13.8	16.34
Venereal Disease	525	12.8	13.9
Chronic Septicaemia	445	10.9	10.72
Glaucoma	314	7.6	8.7
Injury	164	4.0	6.4
Others		33.6	27.17
		<hr/> 100.0	<hr/> 100.0

TABLE 3. (Appendix E)
*Causes of blindness: second eye:
age at onset of blindness.*

Sex Incidence.

Table 3 shows the sex incidence for all causes in age groups and the totals are also given.

It is evident that there is little difference in the incidence of blindness between the sexes and the total number of males, 2,015, and females, 2,063, nearly conforms to the proportion of each sex in the population.

Considering the causes separately, there is a significant difference in a number of causes.

The following are commoner in males:— Congenital anomalies and abiotrophies, particularly the latter; acquired syphilis; trauma is very much commoner in men, showing a ratio for all forms of over 5-1; vascular diseases.

The following are commoner in females:— Myopia; cataract; congenital syphilis; septicaemia, diabetes.

Comments on causes of blindness are made under age groups to conform with the Glasgow report.

Pre-School period (0-4 years):— Congenital anomalies and ophthalmia neonatorum are together chiefly responsible for blindness, accounting for 62.8 per cent. of the total of 366 cases. Congenital syphilis is next in importance with a percentage of 8.4.

School period (5-15 years):— With a total of 247 cases, this period shows a decidedly lower incidence than the pre-school period.

Congenital syphilis is the commonest cause, with 53 cases accounting for 22.6 per cent. of the total.

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Congenital anomalies and abiotrophies show 47 cases=19 per cent.

Sympathetic ophthalmia with 17 cases is the highest incidence of any period.

Blindness is attributed to myopia at this early age in 8 cases, 3.2 per cent. of the total.

Adolescent period (16-29 years):—Total cases 409. The causes in order of frequency are as follows:—Congenital anomalies and abiotrophies 82=20 per cent. Congenital syphilis 54=13.2 per cent. Chronic septicaemia 50=12.2 per cent. Trauma 48=11.7 per cent. Myopia 45=11 per cent. Acquired syphilis makes its first appearance with 10 cases.

Working period (30-49 years):—Total cases 781.

Myopia heads the list of causes with 131 cases, 16.7 per cent. of the total. Chronic septicaemia 118 cases, 15.1 per cent. Abiotrophies 72 cases, 9.2 per cent. Acquired syphilis 63 cases and congenital syphilis 58 cases, 8.06 and 7.4 per cent. respectively. Trauma, including sympathetic ophthalmia, accounts for 56 cases, 7.1 per cent.

50 years and over:—Total cases 2,272. The number of cases in this extensive period shows that 55.7 per cent. of the total cases of blindness occur at 50 years and over.

Cataract takes first place with 663 cases, 29.1 per cent. Myopia 376 cases, 16.3 per cent. Glaucoma, 274, 12 per cent. Chronic septicaemia 240, 10.5 per cent. Vascular diseases 151, 6.6 per cent.

It will be noted that the degenerative diseases are now the prominent causes, cataract showing the highest incidence.

Comparing the figures in this table with the Glasgow report, the greatest difference is in the incidence of acquired syphilis as a cause of blindness. In Glasgow and the South-West acquired syphilis is responsible for 196 cases, or 6.08 per cent. of the total, compared with 151 cases, or 3.7 per cent. in the rest of Scotland.

TABLE 4. (Appendix E)

*Causes of blindness: second eye:
age at onset of eye trouble.*

A table recording the age at onset of eye trouble can profess to a fair degree of accuracy only, as there may be considerable doubt in conditions where the onset is insidious. The history given by the patient is frequently vague or misleading, and the age recorded is the considered opinion of the examiners. Instructions to examiners by the Department of Health for Scotland show an appreciation of the difficulty: "It is expected that examiners will usually be able to obtain the approximate age of onset. The surgeon's opinion is more reliable than the patient's statement."

TABLE 2. APPENDIX

CAUSES OF BLINDNESS, SECOND EYE AT PRESENT AGE

CAUSES	TOTALS			CASES BY AGE GROUPS														
	Total	M.	F.	Total	1-4		5-15		16-29		30-39		40-49		50-64		65+	
					M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
CONGENITAL AND UNDETERMINED																		
Congenital anomalies	235	128	107	6	6	22	14	41	25	28	12	10	14	15	28	6	8	
Abiotrophies, etc. (Retinitis Pigmentosa) (Leber) (Tay Sachs)	213	137	76	1	1	8	3	15	13	15	9	29	10	55	31	14	10	
Tumour of Globe and Orbit	4	3	1									1		1				
Myopia	563	220	343			2		22	14	9	17	35	25	93	142	59	145	
Other errors of refraction	4	3	1						1	1						2		
Glaucoma, primary	314	161	153					2		3	2	6	7	41	44	109	100	
Cataract, primary	706	371	335					4			3	7	6	70	66	190	360	
Other primary ocular defects (Primary Detachment)	54	33	21			2		1		3	1	6	2	13	12	8	6	
INFECTIOUS AND TOXIC																		
Ophthalmia Neonatorum	140	70	70	2	2	4	1	14	12	11	13	13	19	12	18	10	5	
Trachoma	35	17	18					1		2	2	2	2	3	9	9	5	
Local septic infection of coats of eye	153	71	82					1	3	2	3	6	8	30	33	32	33	
Other local specific infections (Gonorrhoea) (Mycosis)	5	1	4									1		1	2		2	
Gonorrhoea	3	2	1									2						
Syphilis, congenital	231	103	128	1	1	4	5	27	20	12	33	23	23	28	41	8	5	
Syphilis, acquired including not definitely congenital	151	103	48					2	2	7	3	21	9	53	24	20	10	
Specific fevers (Smallpox) (Measles) (Scarlet) (Diphtheria)	37	20	17					4	3	5	1	3	2	4	5	4	5	
Meningitis (non-tuberculous) including Cerebro-Spinal Fever	12	4	8			1	2	1	2	1	1	1	2					
Tuberculosis	24	13	11					3	1	3	2	2	4	2	6	14	8	
Phlyctenular, Strumous and similar, not definitely tuberculous	57	23	34			2		2	3	1	1					3	2	
Septicaemia, acute	5	3	2							2								
Septicaemia, chronic, auto-toxic-focal sepsis	445	190	255	1	1	11		7	8	6	13	34	27	74	103	67	103	
Other general infections and organismal diseases	13	6	7					1	1			1	1	2	2	2	3	
TRAUMATIC AND CHEMICAL																		
Birth Trauma	5	3	2			1	1	1	1	1			3	5	4	6	5	
Non-industrial Trauma	37	23	14			1		5	1					41		25	2	
Industrial Trauma	95	92	3					6		8	1	12		7		1		
War Trauma	25	25						1		4		12						
Trauma, category not ascertainable	2	2																
Sympathetic Ophthalmia	57	42	15			2		3	3	7	3	2		16	8	12	1	
Chemico-toxic, non-industrial (Tobacco) (Alcohol) (Lead)	11	11												6		5		
SYSTEMIC DISEASE																		
Anaemia and Blood Diseases	7	2	5						1				1	1	1	1	2	
Diabetes	50	15	35							1			1	6	23	7	12	
Nephritis	9	5	4											5	3			
Pregnancy, diseases of pregnancy or Child Birth (i.e. Eclampsia)	5		5						1		3		1					
Vascular diseases, including cerebral vascular lesions	163	97	66					2		2	2	3		22	16	68	48	
Intracranial Neoplasm	29	12	17			4	1	5		5	5	4	5	3	4	1	2	
Other diseases of central nervous system	33	17	16			1	1		3	4	4	4	2	6	3	1	2	
Functional disturbances (Hysteria) (malingering)	7	4	3											3	1	1	2	
Other general diseases	15	9	6					1			2	2	1	1	2	5	1	
Not classified owing to lack of data	124	73	51			2	2	7	2	8	7	11	10	24	16	21	13	
Totals	4078	2015	2063	33	17	57	32	179	120	152	143	255	188	649	658	706	906	
							89		299		295	443			1307		1612	

TABLE 3 (APPENDIX E)
CAUSES OF BLINDNESS. SECOND FIVE AGE AT ONSET OF BLINDNESS

CAUSES	TOTALS			CASES BY AGE GROUPS													
	Total	Total	Total	Under 5		5-15		16-29		30-39		40-49		50-64		65+	
				M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
CONGENITAL AND UNDETERMINED	235	128	107	58	30	16	9	23	12	5	4	9	11	7	6	1	
	213	137	76	7	5	15	7	32	15	22	8	29	13	29	20	5	
	4	3	1	—	—	—	—	—	—	—	—	—	—	1	—	—	
	563	229	334	4	2	5	2	24	21	19	20	43	49	95	184	62	
	4	3	1	—	—	—	—	—	—	—	—	—	—	1	—	—	
	314	161	153	—	—	—	—	—	—	—	—	—	—	—	—	—	
	706	271	435	1	1	2	1	5	3	3	4	12	15	90	115	76	
	54	33	21	—	—	3	—	7	2	4	2	5	5	9	10	2	
	140	70	70	43	27	8	5	2	1	4	—	5	2	3	5	—	1
	35	17	18	1	1	1	1	1	2	3	—	12	3	5	7	—	5
153	71	82	1	1	4	4	4	5	2	4	11	16	25	31	—	18	
5	1	4	—	—	—	—	—	—	—	—	—	—	—	—	—	2	
3	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
231	103	128	19	8	26	30	23	31	14	11	11	15	18	11	18	—	1
151	103	48	—	—	—	—	5	5	20	8	20	22	13	45	20	—	2
37	20	17	—	—	7	1	6	1	1	1	1	1	1	2	4	—	1
12	4	8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24	13	11	1	—	2	4	4	2	4	2	2	1	2	—	—	—	—
57	22	34	—	—	5	3	4	4	6	2	2	4	7	2	3	—	1
5	3	2	—	—	1	—	—	—	—	1	1	—	—	—	—	—	—
445	190	255	1	4	15	9	17	33	23	23	29	28	38	67	85	34	54
13	6	7	—	—	1	1	—	1	1	—	—	1	1	1	2	1	2
5	3	2	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—
37	23	14	—	—	8	—	1	5	1	1	3	2	2	5	4	—	2
95	92	3	—	—	1	—	—	27	—	17	1	15	1	20	—	—	1
25	25	—	—	—	1	—	—	16	—	4	—	3	—	1	—	—	—
2	2	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—
57	42	15	—	—	11	6	—	13	3	5	3	2	—	4	3	—	—
11	11	—	—	—	—	—	—	—	—	1	—	1	—	6	—	—	—
7	2	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50	15	35	—	—	—	—	1	—	1	1	—	—	1	1	—	1	2
9	5	4	—	—	—	—	—	—	—	—	—	1	1	4	2	—	10
5	—	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
163	97	66	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29	12	17	—	—	—	—	—	2	1	2	2	3	2	35	20	55	41
33	17	16	—	—	4	1	—	3	2	2	5	2	8	1	1	1	1
7	4	3	—	—	—	—	—	2	3	3	3	4	—	5	3	1	1
15	9	6	—	—	—	—	—	1	—	—	—	1	—	1	1	—	—
124	73	51	—	—	2	6	6	10	8	1	6	13	7	—	1	5	1
4078	2015	2063	130	134	148	99	245	164	174	130	243	234	562	645	1207	466	603
Totals																	1069
Not classified owing to lack of data																	

TABLE 4 (APPENDIX E)
CAUSES OF BLINDNESS. SECOND EYE AFTER AT ONSET OF EYE TROUBLE

CAUSES	TOTALS			CASES BY AGE GROUPS													
	Total	Total	Total	1-4		5-15		16-29		30-39		40-49		50-64		65+	
	M. & F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
CONGENITAL AND UNDETERMINED																	
Congenital anomalies	235	128	107	108	94	11	4	7	5	1	3	—	—	—	—	1	—
Abiotrophies, etc. (Retinitis Pigmentosa) (Leber) (Tay Sachs)	213	137	76	35	11	21	18	28	22	31	9	—	—	—	—	—	—
Tumour of Globe and Orbit	4	3	1	1	—	1	—	—	—	—	—	—	—	—	—	—	—
Myopia	563	220	343	24	68	46	9	118	192	6	9	7	8	1	14	2	5
Others errors of refraction	4	3	1	—	—	—	—	1	—	1	—	—	—	—	—	—	—
Glaucoma, primary	314	161	153	1	1	—	—	1	4	6	3	9	23	62	60	68	56
Cataract, primary	706	271	435	3	1	—	—	5	2	6	2	8	15	27	107	114	232
Other primary ocular defects (Primary Detachment)	54	33	21	—	—	1	—	3	1	9	3	4	5	8	8	3	1
INFECTIOUS AND TOXIC																	
Ophthalmia Neonatorum	140	70	70	70	70	—	—	—	—	—	—	—	—	—	—	—	—
Trachoma	35	17	18	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Local septic infection of coats of eye	153	71	82	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other local specific infections (Gonorrhoea) (Mycosis)	5	1	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Gonorrhoea	3	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Syphilis, congenital	231	103	128	12	23	12	23	49	56	16	18	3	5	1	1	—	—
Syphilis, acquired including not definitely congenital	151	103	48	—	—	—	—	1	1	6	12	28	11	35	10	5	1
Specific fevers (Smallpox) (Measles) (Scarlet) (Diphtheria)	37	20	17	—	—	7	11	5	2	4	1	—	—	1	2	—	—
Meningitis (non tuberculous) including Cerebro-Spinal Fever	12	4	8	—	—	3	3	3	3	1	—	—	—	—	—	—	—
Tuberculosis	24	13	11	1	1	1	—	4	1	2	3	1	5	2	—	—	—
Phyctenular, Strumous and similar, not definitely tuberculous	57	23	34	3	1	5	10	9	14	4	3	—	—	1	2	1	—
Septicaemia, acute	3	3	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—
Septicaemia, chronic, auto-toxic, focal sepsis	5	3	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other general infections and organismal diseases	445	190	255	2	10	14	16	22	29	33	44	30	35	38	47	22	34
13	6	7	—	—	—	2	2	—	1	1	3	—	—	1	1	—	—
TRAUMATIC AND CHEMICAL																	
Birth Trauma	5	3	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Non-industrial Trauma	37	23	14	1	1	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Trauma	95	92	3	—	—	3	1	9	3	29	—	18	2	3	4	2	1
War Trauma	25	26	—	—	—	—	—	1	1	16	—	7	—	1	1	—	—
Trauma, category not ascertainable	2	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sympathetic Ophthalmia	57	42	15	—	—	1	2	11	7	15	1	4	2	4	2	3	—
Chenico-toxic, non-industrial (Tobacco) (Alcohol) (Lead)	11	11	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—
136/93/101 septic	6/63/101 septic	101 septic	101 septic	101 septic	101 septic	101 septic	101 septic	101 septic	101 septic	101 septic	101 septic	101 septic	101 septic	101 septic	101 septic	101 septic	101 septic
SYSTEMIC DISEASE																	
Anaemia and Blood Diseases	7	2	5	—	—	—	—	—	1	—	2	—	—	—	—	—	—
Diabetes	50	15	35	—	—	—	—	1	—	—	—	1	—	8	24	3	6
Nephritis	9	5	4	—	—	—	—	—	—	—	—	—	—	3	1	—	—
Pregnancy diseases of pregnancy or child birth (i.e. Eclampsia)	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vascular diseases, including cerebral vascular lesions	163	97	66	—	—	—	—	2	—	4	1	2	3	4	28	41	30
Intracranial Neoplasm	29	12	17	1	—	1	—	4	1	3	4	3	6	4	8	3	—
Other diseases of central nervous system	33	17	16	2	—	—	—	—	7	3	3	4	2	3	2	1	1
Functional disturbances (Hysteria) (malingering)	7	4	3	—	—	—	—	—	—	1	—	—	—	1	2	1	—
Other general diseases	15	9	6	—	—	—	—	3	1	—	2	—	—	—	—	5	1
124	73	51	—	2	2	6	6	11	10	10	8	12	4	9	6	7	6
Not classified owing to lack of data	4078	2015	2063	291	272	152	188	312	377	221	146	159	119	185	170	392	406
Totals	4078	2015	2063	593	593	340	340	689	689	367	367	278	278	355	355	798	688

TABLE 5 (APPENDIX A)
OCCUPATIONS ENGAGED IN PRIOR TO BLINDNESS OF THE
4,078 CASES FOR THE REST OF SCOTLAND

	M.	F.
FISHING INDUSTRY	55	—
AGRICULTURAL OCCUPATIONS		
Dairyworkers, Ploughmen	130	17
Others	43	1
MINING AND QUARRYING OCCUPATIONS		
Miners (coal and shale)	205	—
Others	25	1
METAL WORKERS (<i>not electro-plate or precious metals</i>)	88	7
ELECTRICAL WORKERS	12	—
TEXTILE WORKERS		
Spinners, Weavers, Winders	81	259
Tailors, Milliners, Tailoresses	37	45
Others	33	9
MAKERS OF FOODS, DRINKS AND TOBACCO		
Bakers	19	1
Others	24	5
WORKERS IN WOOD AND FURNITURE	46	1
BUILDERS, BRICKLAYERS, STONE AND SLATE WORKERS	19	—
BUILDERS' ETC., LABOURERS	39	—
PAINTERS AND DECORATORS, FRENCH POLISHERS	16	—
TRANSPORT AND COMMUNICATIONS		
Railway Transport Workers	20	—
Road Transport Workers	57	—
Water Transport Workers	30	—
Others	74	1
COMMERCIAL OCCUPATIONS		
Salesmen and Shop Assistants	96	28
Others	32	8
PROFESSIONAL OCCUPATIONS (<i>excluding Clerical</i>)	56	29
CLERICAL OCCUPATIONS (<i>Clerks, Typists, etc.</i>)	28	12
PERSONS ENGAGED IN PERSONAL SERVICE (<i>including Institutions, Clubs, Hotels, etc.</i>)		
Domestic Service	11	198
Others	21	61
OTHER GENERAL OCCUPATIONS		
Labourers	201	2
Housewives	—	952
NO OCCUPATION	473	383
Totals	2015	2063

TABLE 6 (X AND APPENDIX D)
AVERAGE DURATION FROM ONSET TO ACTUAL BLINDNESS
OF THE MORE IMPORTANT CASES

Cause of Blindness	Number of Cases	Mean Age Onset	Mean Age Blindness	Average Duration in Years
Myopia	563	12.1	51.6	39.5
Trachoma	35	26.1	50.0	23.9
Phlyctenular Disease	57	15.8	41.5	25.7
Abiotrophy	213	15.5	35.6	20.1
Congenital Anomalies	235	—	14.4	14.4
Chronic Septicaemia	445	37.4	47.6	10.2
Congenital Syphilis	231	11.3	22.1	10.8
Local Infections	158	33.9	49.1	15.2
Ophthalmia Neonatorum	140	1.0	9.9	8.9
Specific Fevers (Smallpox) (Measles) (Scarlet) (Diphtheria)	37	13.3	23.1	9.8
Cataract	706	60.8	65.0	4.2
Diabetes	50	56.8	60.6	3.8
Non Industrial Injury	67	26.2	31.1	4.9
Glaucoma	314	57.8	61.9	4.1
Industrial Injury	95	40.5	42.6	2.1
Sympathetic Ophthalmia	57	25.9	29.4	3.5
Meningitis	12	9.0	11.5	2.5
Vascular Disease	163	60.0	63.8	3.8
Acquired Syphilis	151	43.9	49.3	5.4
Diseases of Central Nervous System	40	33.6	37.2	3.6
Others	309	34.4	50.9	16.5
	4078	33.5	47.1	13.6

TABLE 7 (IX)
CAUSES IN RELATION TO DURATION OF BLINDNESS

Cause of Blindness	Number of Cases	Percentage Distribution	Patient Years of Blindness as Percentage of Total
Others	644	15.8	13.5
Chronic Septicaemia	445	10.9	12.7
Syphilis Congenital	231	5.7	12.1
Congenital Anomalies	235	5.8	11.7
Ophthalmia Neonatorum	140	3.4	11.3
Injury—All Forms	221	5.4	9.0
Myopia	563	13.8	9.0
Cataract	706	17.3	4.6
Local Infections	158	3.9	4.5
Abiotrophy	213	5.2	4.4
Glaucoma	314	7.7	2.8
Syphilis Acquired	151	3.7	2.3
Phlyctenular Disease	57	1.4	2.1
All causes	4078	100.0	100.0

TABLE 8 (XXXII)
CASES WHICH TREATMENT MIGHT REMOVE FROM
BLIND CATEGORY

Defect	Number of Cases	Treatment Recom- mended	Percentage might Improve
Cataract	690	260	37.7
Aphakia	41	11	26.8
Inflammatory Disease of Cornea-Interstitial	147	32	21.8
Optic Neuritis or Atrophy (Primary and Extra-ocular)	349	59	16.9
Cataract (Congenital)	89	14	15.7
Irido-Cyclitis	432	56	13.0
Inflammatory Disease of Cornea-Ulcerative	421	54	12.8
Glaucoma-primary	317	39	12.3
Detachment of Retina	53	3	5.7
Total	2539	528	20.8

TABLE 8. (XXXII)

*A selection of the more important conditions where
treatment might remove from the blind category.*

Out of the total of 4,078 blind persons under review treatment was recommended by the examining surgeons in 703 cases—17.2 per cent. In the great majority of cases the treatment recommended was surgical.

In the Glasgow report it was considered that in 16.2 per cent. of the cases treatment might cure the blindness, the treatment being mainly surgical.

TABLE 9. (L and M Appendix)

*Defects in second blind eye with distribution
according to sex, age of onset, age of blindness.*

This table is given in detail and corresponds with the L and M Glasgow tables.

In the Glasgow report the six defects shown below were responsible for nearly three-quarters of the cases. For the rest of Scotland the same group was responsible for 68.8 per cent. The comparative percentages are given in this excerpt.

The next most important defects found were retinitis degenerative, including pigmentosa 238 cases, 5.84 per cent., and choroiditis, not myopic, 209 cases, 5.13 per cent.

The total congenital defects found was 202 cases of which cataract was commonest with 89 cases, 2.18 per cent.

	Cases	Percentage of Total	Glasgow Percentage
Cataract and Aphakia ...	731	17.93	17.6
Myopia	559	13.71	16.3
Optic Nerve Atrophy ...	349	8.56	11.8
Ulcer of Cornea ...	421	10.32	9.8
Primary Glaucoma ...	317	7.77	8.7
Irido cyclitis	432	10.59	8.7
	2,809	68.88	72.9

TABLE 10. (N Appendix)

Causes of blindness with defects found at examination.

The defects found are shown in their relationship to the different causes of blindness.

Congenital conditions are given in detail and this Table cannot be combined with the Glasgow figures so far as these conditions are concerned.

TABLE 11.

Occurrence of specified disease.

This table is designed to reveal the comparatively high incidence of certain causes of blindness in the different regions.

Cataract as a cause of blindness in the Inverness and Zetland regions is at least partly due to lack of facilities for operative treatment in the sparsely populated country areas.

Myopia shows a significantly high percentage in the Dundee clinic, where women textile workers are commonly affected.

Out of the total of 169 persons blind from myopia 99 were female jute workers, and of these 33 were blind in the age groups 16-49.

Retinitis pigmentosa is unusually common in the Aberdeen area where the subject is at present under investigation. Most cases are sporadic and the heredity of the disease is very complicated. The majority appear to be recessive in character and consanguinity must be a factor even although relationship cannot be traced.

TABLE 9 (APPENDIX L & M)

DEFECTS IN SECOND BLIND EYE WITH DISTRIBUTION ACCORDING TO SEX, AGE OF ONSET OF EYE TROUBLE AND AGE OF BLINDNESS

CONDITION	DISTRIBUTION			AGE OF ONSET OF EYE TROUBLE										AGE AT ONSET OF BLINDNESS									
	Cases	%	Males	%	Birth	1-4	5-15	16-29	30-39	40-49	50-64	65+	N.S.	Birth	1-4	5-15	16-29	30-39	40-49	50-64	65+	N.S.	
eyeball	107	2.62	98	4.86	—	3	14	37	18	13	14	8	—	—	—	9	37	19	16	15	11	—	
disease of conjunctiva...	38	0.93	18	0.89	7	5	8	6	2	1	6	3	—	4	2	5	3	3	3	12	6	—	
disease of lids and lacrymal sac	6	0.15	1	0.05	—	—	2	1	—	—	1	1	—	—	—	—	—	—	—	2	4	—	
disease of sclera	6	0.15	1	0.05	—	—	2	1	—	—	1	—	—	—	—	—	—	—	—	2	—	—	
disease of cornea, ulcerative	421	10.32	202	10.02	16	60	52	27	24	33	52	27	—	86	33	43	30	23	45	96	65	—	
disease of cornea, interstitial	147	3.60	72	3.57	16	22	74	26	5	3	1	—	—	5	6	36	32	20	24	20	4	—	
disease ...	22	0.54	6	0.30	7	2	3	4	1	1	4	—	—	2	—	—	3	4	8	4	1	—	
... Panophthalmitis, Sympathetic	432	10.59	189	9.38	22	34	71	81	60	69	67	28	—	5	12	41	68	52	64	138	52	—	
lative ...	45	1.10	32	1.59	—	5	15	14	4	1	5	1	—	—	3	15	12	6	2	5	2	—	
enerative inc. Pigmentosa	58	1.42	20	0.99	2	2	3	5	4	7	24	11	—	1	2	1	4	4	5	26	15	—	
f Retina ...	238	5.84	153	7.59	40	41	45	28	10	16	33	25	—	7	4	20	35	26	42	63	41	—	
Myopic	53	1.30	34	1.69	—	—	3	11	8	11	15	5	—	—	—	3	9	7	10	17	7	—	
or Atrophy (primary extra-ocular)	209	5.13	96	4.76	25	17	21	25	19	20	45	37	—	15	4	8	27	12	27	61	55	—	
Neuritis, Toxic Amblyopia	349	8.56	232	11.51	36	11	35	53	55	65	63	31	—	26	11	34	44	48	60	86	40	—	
... ocular	22	0.55	17	0.84	—	—	2	2	5	4	6	3	—	—	—	1	3	3	5	6	4	—	
... normalities	4	0.10	1	0.05	—	2	—	—	—	—	1	1	—	—	2	—	—	—	—	—	2	—	
... and refractive error	3	0.07	2	—	1	2	—	7	—	46	261	—	—	—	3	—	2	7	24	206	450	—	
haemorrhage	690	16.92	268	13.40	2	4	5	1	4	5	18	9	—	1	—	1	2	3	3	14	17	—	
mary	41	1.01	20	0.99	2	—	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
ondary (Haemorrhagic)	1	0.02	1	0.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
... tract Lesions	559	13.71	220	10.32	66	115	307	16	14	13	21	7	—	4	4	7	46	43	90	276	89	—	
... Anopsia	13	0.32	6	0.30	1	1	2	1	2	—	6	2	—	—	—	—	2	2	1	5	3	—	
... anomalies	29	0.71	17	0.84	—	—	—	5	3	—	9	10	—	—	—	—	5	3	7	14	—	—	
...	317	7.77	160	7.94	3	2	10	9	12	39	120	122	—	1	—	1	8	10	21	112	164	—	
...	2	0.05	2	0.10	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	
...	5	0.12	3	0.15	1	1	1	2	—	—	2	—	—	1	1	1	—	—	—	3	5	—	
...	15	0.37	6	0.30	2	—	—	—	—	1	6	3	—	—	—	—	—	—	—	—	—	—	
...	1	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
...	9	0.22	8	0.40	—	1	1	—	1	2	3	—	—	—	—	—	1	1	1	3	4	—	
...	202	4.93	114	5.66	180	8	9	2	1	2	—	2	—	103	13	19	30	5	19	10	3	—	
...	34	0.83	16	0.79	4	1	1	3	2	3	13	7	—	2	1	—	3	5	2	12	9	—	
				100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

TABLE 11.
Occurrence of Specified Diseases.

Clinic	Total No. of Cases	Cataract	Per cent.	Myopia	Per cent.	Abio- trophies	Per cent.
Aberdeen ...	711	83	11.1	93	13.1	71	10.0
Dumfries ...	96	24	25.0	11	11.5	4	4.2
Dundee ...	928	196	21.1	169	18.2	21	2.3
Edinburgh ...	2,061	306	14.8	257	12.5	107	5.2
Inverness ...	240	80	30.3	30	12.5	6	2.5

TABLES FOR ALL SCOTLAND.

The tables which follow are the result of amalgamation of the figures for Glasgow and South-West Scotland and the figures published in this report for the rest of Scotland.

The combined tables deal with 7,297 registered blind persons out of an estimated total of between 9,500 and 10,000 registered and unregistered in Scotland.

TABLE A. (ALL SCOTLAND)

*Age distribution at onset of eye trouble and
at onset of blindness.*

The higher age groups are combined as 50 and over, as further subdivision was not possible on account of the different methods of grouping in the two investigations. This applies to all the combined tables.

There is no separate record for males and females for the whole of Scotland but comments are made on sex incidence under Table 3 for the rest of Scotland.

The importance of the first year of life both as regards the onset of conditions causing blindness and the onset of blindness itself is shown in the table, the percentages of the total being 12.7 and 5.8 respectively.

This table emphasises the importance of the lag in registration of blindness. Only one case is registered as blind in the age group O—under 1 although in 420 cases it was stated that blindness occurred under the age of one year.

This question of lag in registration has been discussed in the introduction to this report where it is pointed out that the lag occurs up to the age group 16-29.

TABLE A. (ALL SCOTLAND).
AGE DISTRIBUTION AT ONSET OF EYE TROUBLE.
ONSET OF BLINDNESS AND PRESENT

Age Group	Number of Persons in Group at		
	Onset Eye Trouble	Onset Blindness	Present Age
Under 1	924	420	1
1-4	489	205	52
5-15	1,355	452	182
16-29	658	673	530
30-39	541	600	540
40-49	687	912	805
50+	2,623	4,017	5,187
Not stated	20	18	—
Totals	7,297	7,297	7,297

At the time of examination persons aged 50 years and over accounted for 71.1 per cent. of the cases; ages 16-49 for 25.7 per cent., and ages under 16 for 3.2 per cent.

TABLE B. (ALL SCOTLAND)

Causes of blindness second eye at present age.

The more important causes are given below with the number of cases and percentages.

Cause	Cases	Percentage
Cataract	1246	17.1
Myopia	1089	14.9
Chronic septicaemia	790	10.8
Syphilis congenital and acquired ...	730	10.0
Glaucoma	594	8.1
Others	2848	39.1
	7297	100.0

TABLE B (ALL IRELAND).
CAUSES OF BLINDNESS—SECOND EYE, AT PRESENT AGE

Causes	Totals Male and Female	Cases by Age Groups							Over 50	Not Stated
		Under 1	1-4	5-15	16-29	30-39	40-49	Over 50		
CONGENITAL AND UNDETERMINED										
Congenital Anomalies	388	1	20	64	109	54	44	96		
Abiotrophies, etc. (Retinitis Pigmentosa) (Leber) (Tay Sachs')	300	—	1	11	39	42	58	149		
Tumour of Globe and Orbit	8	—	1	2	1	—	1	3		
Myopia	1,089	—	—	5	56	50	116	862		
Other Errors of Refraction	5	—	—	—	1	1	—	3		
Glaucoma, Primary	594	—	—	—	3	7	24	560		
Cataract, Primary	1,246	—	—	—	5	5	26	1,210		
Other Primary Ocular Defects (Primary Detachment)	82	—	—	2	5	8	13	54		
Totals ...	3,712	1	22	84	219	167	282	2,937		
INFECTIOUS AND TOXIC										
Ophthalmia Neonatorum	239	—	10	18	43	46	45	77		
Trachoma	61	—	—	—	3	9	8	41		
Local Septic Infection of Coats of Eye	234	—	—	2	5	10	18	199		
Other Local Specific Infections (Gonorrhoea, Mycosis)	8	—	—	—	—	—	2	6		
Totals ...	542	—	10	20	51	65	73	323		
Endogenous										
Gonorrhoea	5	—	—	—	—	—	—	3		
Syphilis, Congenital	383	—	3	20	90	73	2	125		
Syphilis, Acquired, including not definitely Congenital	347	—	—	—	6	39	72	215		
Specific Fevers (Smallpox, Measles, Scarlet, Diphtheria)	76	—	1	6	14	10	13	32		
Meningitis (Non-Tuberculous) including Cerebro-Spinal Fever	51	—	3	10	15	5	7	11		
Tuberculosis	44	—	—	1	10	10	10	14		
Phlyctenular, Strumous and Similar, not definitely Tuberculous	141	—	—	5	13	14	18	91		
Septicaemia, Acute	15	—	—	—	2	3	1	9		
Septicaemia, Chronic; Auto-toxic, focal sepsis	790	—	3	4	31	52	104	596		
Other General Infections and Organismal Diseases	44	—	1	1	7	3	6	26		
Totals ...	1,896	—	11	47	188	208	320	1,122		
TRAUMATIC AND CHEMICAL										
Birth Trauma	8	—	3	2	2	1	—	—		
Non-industrial Trauma	65	—	1	1	9	8	11	35		
Industrial Trauma	176	—	—	—	10	18	29	119		
War Trauma	34	—	—	—	1	6	18	9		
Trauma of Other Organs	128	—	—	—	1	1	1	14		
Sympathetic Ophthalmia	18	—	—	5	10	16	6	91		
Chemico-toxic (Non-industrial) (Tobacco, Alcohol, Lead)	—	—	—	—	—	1	—	17		
Totals ...	446	—	4	8	33	51	65	285		
SYSTEMIC DISEASE										
Anaemia and Blood Diseases	8	—	—	—	1	—	1	6		
Diabetes	93	—	—	—	2	1	4	86		
Nephritis	14	—	—	—	—	1	1	12		
Pregnancy, Diseases of Pregnancy or Child Birth (i.e. Eclampsia)	11	—	—	—	1	3	2	5		
Vascular Diseases including Cerebral Vascular Lesions	263	—	—	—	2	5	4	252		
Intracranial Neoplasm	65	—	1	10	10	13	11	20		
Diseases of Central Nervous System	77	—	3	4	8	9	15	38		
Other General Diseases	23	—	—	3	1	2	5	12		
Totals ...	554	—	4	17	25	34	43	431		
Not Classified Owing to Lack of Data	147	—	1	6	14	15	22	89		
Totals	7,297	1	52	182	530	540	805	5,187		

CAUSES OF BLINDNESS. SECOND YEAR. AGE AT ONSET OF BLINDNESS

Causes	Totals Male and Female	Cases by Age Groups							Over 50	Not Stated	
		Under 1	1-4	5-15	16-29	30-39	40-49				
CONGENITAL AND UNDETERMINED											
Congenital Anomalies	388		22	37	42	14	32	35			
Abiotrophies, etc. (Retinitis Pigmentosa) (Leber) (Tay Sachs')	300		5	25	72	42	63	81			
Tumour of Globe and Orbit	8		5					3			
Myopia	1,089		4	16	80	83	179	712		9	
Other Errors of Refraction	5			1	2			2			
Glaucoma, Primary	594			1	10	22	41	519		1	
Cataract, Primary	1,246		1	2	5	14	57	1,163		2	
Other Primary Ocular Defects (Primary Detachment)	82			4	15	10	18	35			
Totals ...	3,712		37	86	226	185	390	2,550		12	
INFECTIOUS AND TOXIC											
Ophthalmia Neonatorum	239		44	15	6	10	12	15			
Trachoma	61		1	3	6	7	8	36			
Local Septic Infection of Coats of Eye	234		9	18	10	14	34	146			
Other Local Specific Infections (Gonorrhoea, Mycosis)	8			1	1	1	2	3			
Totals ...	542		54	37	23	32	56	200			
ENDOGENOUS											
Gonorrhoea	5										
Syphilis, Congenital	383		19	107	91	1	55	47		1	
Syphilis, Acquired, Including Not Definitely Congenital	347				20	41	98	150		1	
Specific Fevers (Smallpox, Measles, Scarlet, Diphtheria)	76		28	15	8	5	3	16			
Meningitis (Non-Tuberculous) Including Cerebro-Spinal Fever	51		17	18	5	3	4				
Tuberculosis	44		1	6	15	10	3	8			
Phlyctenular, Strumous and Similar Not Definitely Tuberculous	141		9	24	22	12	25	49			
Septicaemia, Acute	15		2	3		2	3	4			
Septicaemia, Chronic; auto-toxic Focal Sepsis	790		12	42	93	104	126	404		1	
Other General Infections and Organismal Diseases	44		4	7	5	7	3	18			
Totals ...	1,896		92	224	260	263	320	697		3	
TRAUMATIC AND CHEMICAL											
Birth Trauma	8		2	1							
Non-industrial Trauma	66		1	16	12	6	7	22			
Industrial Trauma	176			1	45	37	43	50			
War Trauma	34			1	23	5	3	2			
Trauma, Category Not Ascertainable	17			2	1	3	3	8			
Sympathetic Ophthalmia	128		3	36	29	14	14	32		1	
Chemical Injuries	18				1	1	2	13			
Totals ...	446		6	57	111	66	72	127		1	
SYSTEMIC DISEASE											
Anaemia and Blood Diseases	8			1	1		1	5			
Diabetes	93				2	1	5	85			
Nephritis	14					2	3	9			
Pregnancy, Diseases of Pregnancy or Childbirth (i.e. Eclampsia)	11				1	6	2	2			
Vascular Diseases Including Cerebral Vascular Lesions	263				3	5	11	243		1	
Intracranial Neoplasm	65		3	9	13	11	17	11			
Diseases of Central Nervous System	77		3	13	13	8	12	23			
Other General Diseases	23			6	2	4	2	9			
Totals ...	554		6	29	35	37	53	387		1	
Not Classified Owing to Lack of Data	147		10	19	18	17	21	56		1	
Totals ...	7,297	420	205	452	673	600	912	4,017		18	

TABLE D (ALL SCOTLAND).

CAUSES OF BLINDNESS. SECOND EYE. AGE AT ONSET OF EYE TROUBLE

Causes	Totals Male and Female	Under 1	Cases by Age Groups					Over 50	Not Stated	
			1-4	5-15	16-29	30-39	40-49			
CONGENITAL AND UNDETERMINED										
Congenital Anomalies ...	388	355	15	12	4	—	1	1	—	
Abiotrophies etc. (Retinitis pigmentosa) (Leber) (Tay Sachs') ...	300	49	45	75	75	21	20	14	1	
Tumour of Globe and Orbit ...	8	1	4	—	—	1	—	2	—	
Myopia ...	1,089	130	152	618	40	32	30	80	7	
Other Errors of Refraction ...	5	—	—	2	1	—	—	1	—	
Glaucoma, Primary ...	594	2	1	6	14	24	78	488	1	
Cataract, Primary ...	1,246	8	4	12	18	47	96	1,059	2	
Other Primary Ocular Defects (Primary Detachment) ...	82	—	1	5	20	12	18	26	—	
Totals ...	3,172	546	222	730	172	137	243	1,651	11	
INFECTIOUS AND TOXIC										
Ophthalmia Neonatorum ...	239	239	—	—	—	—	—	—	—	
Trachoma ...	61	4	7	19	9	7	1	14	—	
Local Septic Infection of Coats of Eye ...	234	14	26	35	17	21	35	86	—	
Other Local Specific Infections (Gonorrhoea, Mycosis) ...	8	1	1	1	1	—	3	1	—	
Totals ...	542	258	34	55	27	28	39	101	—	
Endogenous										
Gonorrhoea ...	5	—	—	2	3	—	—	—	—	
Syphilis, Congenital ...	383	51	49	197	58	13	11	4	—	
Syphilis, Acquired, including not definitely Congenital ...	347	2	—	3	38	104	99	100	1	
Specific Fevers (Smallpox, Measles, Scarlet, Diphtheria) ...	76	3	36	25	5	2	1	4	—	
Meningitis (Non-Tuberculous) including Cerebro-Spinal Fever ...	51	7	18	16	5	2	2	—	—	
Tuberculosis ...	44	2	4	16	9	8	3	2	—	
Phlyctenular, Strumous and Similar, not definitely Tuberculous ...	141	5	41	71	13	4	3	4	—	
Septicaemia Acute ...	15	2	3	2	—	1	5	2	—	
Septicaemia Chronic, Auto-toxic Focal Sepsis ...	790	16	38	102	141	115	121	254	3	
Other General Infections and Organismal Diseases ...	44	3	12	5	8	3	6	6	1	
Totals ...	1,896	91	201	439	280	252	251	376	6	
TRAUMATIC AND CHEMICAL										
Birth Trauma ...	8	7	1	—	—	—	—	—	—	
Non-Industrial Trauma ...	65	2	7	22	5	3	8	18	—	
Industrial Trauma ...	176	—	—	3	53	39	39	42	—	
Trauma, Category not ascertainable ...	17	—	—	1	23	8	1	1	—	
Sympathetic Ophthalmia ...	128	1	2	1	2	4	2	6	—	
Chemico-toxic (Non-Industrial) (Tobacco, Alcohol, Lead) ...	18	—	—	40	30	12	16	24	—	
Totals ...	446	10	15	67	116	66	68	103	1	
SYSTEMIC DISEASES										
Anaemia and Blood Diseases ...	8	—	—	1	2	—	—	5	—	
Diabetes ...	93	—	—	1	2	1	11	78	—	
Nephritis ...	14	—	—	—	1	2	4	7	—	
Pregnancy, Diseases of Pregnancy or Childbirth (i.e. Eclampsia) ...	11	—	—	—	1	8	2	—	—	
Vascular Diseases including Cerebral Vascular Lesions ...	263	—	1	2	5	8	21	225	1	
Intracranial Neoplasm ...	65	2	2	10	16	8	20	7	—	
Diseases of Central Nervous System ...	77	5	4	15	13	10	11	19	—	
Other General Diseases ...	23	2	—	6	4	2	1	8	—	
Totals ...	554	9	7	35	44	39	70	349	1	
Not Classified Owing to Lack of Data										
Totals ...	147	5	13	30	19	19	16	44	1	
Totals ...	7,297	919	492	1,356	658	541	687	2,624	20	

These five specified causes together account for 60·9 per cent. of blindness.

TABLE C. (ALL SCOTLAND)

Causes of blindness second eye. Age at onset of blindness.

AGE GROUPS:

0-4 years :—625 cases.

Congenital anomalies 228 cases, and ophthalmia neonatorum 181 cases, are chiefly responsible for blindness, accounting for 65·4 per cent. of the total.

Congenital syphilis is next in importance with 6·5 per cent.

5-15 years :—452 cases.

Apart from the age group 1-4 this group shows the lowest incidence of any period.

Congenital syphilis is the commonest cause with 107 cases, 23·7 per cent. of the total.

Congenital anomalies show 62 cases, 13·7 per cent.

Sympathetic ophthalmia with 36 cases shows the highest incidence of any age group.

Myopia is the cause at this early age in 16 cases.

16-29 years :—673 cases.

	cases	per cent.
Congenital anomalies	114	16·9
Trauma including sympathetic ophthalmia	110	16·3
Chronic septicaemia	93	13·8
Congenital syphilis	91	13·5
Myopia	80	11·9

Acquired syphilis makes its first appearance with 20 cases.

30-39 years :—600 cases.

Chronic septicaemia	104	17·3
Myopia	83	13·8
Syphilis acquired	78	13·0
Trauma	65	10·8
Congenital anomalies	56	9·3
Syphilis congenital	41	6·8

40-49 years :—912 cases.

Myopia	179	19·6
Chronic septicaemia	126	13·8
Syphilis acquired	98	10·7
Syphilis congenital	55	6·0
Congenital anomalies	95	10·4
Trauma all forms	70	7·7
Cataract	57	6·2
Glaucoma	41	4·5

50 and over :—4,014 cases.

Cataract	...	...	...	...	1,163	28.9
Myopia	...	...	...	...	712	17.7
Glaucoma	...	...	...	...	519	12.9
Chronic septicaemia	...	...	...	...	404	10.0
Vascular diseases	...	...	...	...	243	6.0

Analysis of the age distribution of the different causes shows that congenital anomalies and ophthalmia neonatorum account for blindness in 65.4 per cent. of the cases occurring in the first five years of life.

Syphilis, congenital and acquired, is a major cause from 16 to 49 years and is the commonest cause in the age group 30-39 with 19.8 per cent.

As would be expected, the degenerative diseases are the commonest causes of blindness with advancing years, and cataract, myopia and glaucoma together account for 59.6 per cent. of cases onsetting at 50 years and over.

TABLE D. (ALL SCOTLAND)

Causes of blindness second eye. Age at onset of eye trouble.

Under Table 4, the corresponding table for the rest of Scotland, it is pointed out that only a fair degree of accuracy is possible in the data here presented as there is often considerable doubt in the history given by the patient.

In a large number of cases, 919, the onset of eye trouble is attributed to the first year of life, the outstanding causes being congenital anomalies and ophthalmia neonatorum.

There is a decided drop in numbers in the age group 1-4 with myopia as the principal cause.

The onset of myopia is most frequent at 5-15 years, and congenital syphilis is commoner in this age group than in any other.

There is a sudden increase in acquired syphilis at 30-39 and this is maintained in the 40-49 group.

Chronic septicaemia is common from 5-15 throughout life with little variation.

Cataract, glaucoma, vascular diseases and diabetes are uncommon until the age of 50 years.

TABLE E. (ALL SCOTLAND)

Occupations engaged in prior to blindness.

This table is a statement of the facts given in the certificates of blindness.

Difficulty always exists in aligning the population at risk with the occupations recorded in an investigation such as this which covers practically the whole population.

TABLE E (ALL SCOTLAND).

Occupations engaged in prior to Blindness.

	M	F
FISHING INDUSTRY	61	—
AGRICULTURAL OCCUPATIONS		
Dairyworkers, Ploughmen	152	28
Others	63	1
MINING AND QUARRYING OCCUPATIONS		
Miners (coal and shale)	401	1
Others	62	5
METAL WORKERS (NOT ELECTRO PLATE OR PERVIOUS METALS)	387	7
Electrical Workers	15	—
Textile Workers	—	—
Spinners, Weavers, Winders	85	276
Tailors, Milliners, Tailoresses	71	72
Others	80	62
Makers of Foods, Drinks and		
Tobacco	30	2
Bakers	30	2
Others	34	7
Workers in Wood and Furniture	105	3
Builders, Bricklayers, Stone and Slate Workers	49	—
Builders' etc., labourers	43	—
Painters and Decorators, French Polishers	29	6
TRANSPORT AND COMMUNICATIONS		
Railway Transport Workers	64	1
Road Transport Workers	117	—
Water Transport Workers	83	1
Others	79	3
COMMERCIAL OCCUPATIONS		
Salesmen and Shop Assistants	152	49
Others	226	25
PROFESSIONAL OCCUPATIONS (EXCLUDING CLERICAL)	96	54
Glerical Occupations (Clerks, Typists, etc.)	55	17
PERSONS ENGAGED IN PERSONAL SERVICE (INCLUDING INSTITUTIONS, CLUBS, HOTELS, ETC.)		
Domestic Service	11	243
Others	37	107
OTHER GENERAL OCCUPATIONS	44	43
Labourers	373	2
Housewives	—	1,953
NO OCCUPATION	743	582
Totals	3,747	3,550

For information on the numbers at risk in each occupation the source is the 1931 census. In the census, subdivision by occupation and industry results in a fairly precise classification of the population; here, however, a statement has been obtained on occupation

only, and for that reason no attempt has been made to calculate the ratio to the appropriate population at risk.

In the table a large number, 856, is returned as of no occupation. This group comprises children, persons who became blind before entering an occupation, and persons who had been blind for a long time and regarded themselves as no longer employable.

In women, the highest number of blind occurs in housewives. This number undoubtedly covers all the older women whether married or single, who have ceased to be engaged in any other occupation.

For men with specified occupations the greatest number occurs in mining with 401, followed by metal workers 387, and labourers 373.

For women apart from housewives the main occupations are spinners, weavers and winders with 276, and domestic service with 243.

The figures suggest a higher rate of blindness in miners and metal workers than in other occupations in the aggregate in Scotland.

The proportion of spinners, weavers and winders shown blind is much higher than the proportion of these occupations in the female population.

While no precise application of the census figures can be made to determine incidence rates, the figures are suggestive that these three occupations (miners, metal workers and spinners, etc.) have a higher than average incidence of blindness.

Table E also shows the relative sex distribution of the registered blind. In Scotland the population comprises slightly more females than males while the blind population shows the reverse. The consequential higher incidence of blindness in the male sex may be largely accounted for by the greater exposure to injury as the cause of blindness. In Table 2 (*i.e.*, for Scotland other than Glasgow and the South-West) traumatic and chemical conditions show 232 cases of which 198 are for males.

TABLE F. (ALL SCOTLAND)

Average duration from onset to actual blindness of the more important causes.

The average duration in years shows for the different causes the length of the twilight period with progressive deterioration in sight until actual blindness supervenes.

Myopia, trachoma and phlyctenular disease head the list with the longest periods of increasing disability, and industrial injury comes last with an average duration of 2.4 years.

Cataract, with the largest number of cases, shows an average duration of 4.6 years.

The table illustrates that the time available for treatment for a number of causes, *e.g.*, glaucoma, is short.

TABLE F (ALL SCOTLAND).
*Average Duration from Onset to Actual
Blindness of the more Important Causes.*

Cause of Blindness	Number of Cases	Mean Age Onset	Mean Age Blindness	Average Duration in Years
Myopia	1,089	14.1	52.1	37.9
Phlyctenular	141	12.3	37.6	25.3
Trachoma	61	25.4	50.0	24.6
Abiotrophy	300	17.0	36.7	19.7
Congenital Anomalies	388	0.4	14.4	14.0
Local Infections	234	36.0	49.5	13.5
Chronic Septicaemia	790	35.9	47.0	11.2
Congenital Syphilis	383	12.4	23.1	10.7
Ophthalmia Neonatorum	237	1.0	9.5	8.5
Specific Fevers (Smallpox, Measles, Scarlet, Diphtheria)	65	10.1	18.4	8.3
Cataract	1,246	60.7	65.3	4.6
Non-industrial Injury	95	27.8	32.4	4.6
Diabetes	93	56.7	60.8	4.2
Glaucoma	594	58.3	61.9	3.5
Vascular Disease	263	60.3	63.6	3.3
Acquired Syphilis	347	42.9	46.2	3.3
Sympathetic Ophthalmia	128	29.4	32.5	3.1
Diseases of Central Nervous System	77	31.0	33.7	2.7
Meningitis	51	10.0	12.6	2.6
Industrial Injury	176	39.3	41.7	2.4

TABLE G. (ALL SCOTLAND)
Causes in relation to duration of blindness.

The duration of blindness for the different causes is an important aspect of the subject both from the social and personal points of view.

The relative importance of most causes of blindness is entirely changed when the duration in years is considered, and it will be seen from the table that the percentage distribution bears no relation to the "patient years" of blindness.

This is well illustrated in the case of cataract, the cause of the greatest number of cases, which is relegated to seventh place with 5.0 years of blindness.

A new significance is given to causes acting in the early years of life and chronic septicaemia, congenital anomalies, ophthalmia neonatorum and congenital syphilis become the prominent group, together accounting for 54.5 per cent. of the total years of blindness. Myopia, which also affects the early years, takes an intermediate place with 9.5 years.

TABLE G (ALL SCOTLAND).

Causes in Relation to Duration of Blindness.

Cause of Blindness	Number of Cases	Percentage Distribution	Patient Years of Blindness as Percentage of Total
Chronic Septicaemia	790	10.8	12.3
Congenital Anomalies	388	5.3	11.5
Ophthalmia Neonatorum	237	3.2	10.7
Injury—All Forms	428	5.9	10.0
Syphilis Congenital	383	5.3	10.0
Myopia	1,089	14.9	9.5
Cataract	1,246	17.1	5.0
Local Infections	239	3.3	4.0
Abiotrophy	300	4.1	3.7
Phlyctenular Disease	141	1.9	3.4
Glaucoma	594	8.1	3.1
Syphilis Acquired	347	4.8	3.0

TABLE H. (ALL SCOTLAND)

Causes of blindness with defects found at examination.

The defects found are given in their relation to the different causes of blindness.

Numerically the two most important defects were cataract and aphakia with 1,299 cases and myopia with 1,084 cases; 17.8 and 14.9 per cent. respectively. Other defects in order of frequency were as follows:—

	cases	per cent.
Ulceration of the cornea	737	10.0
Optic neuritis and atrophy	729	10.0
Iridocyclitis	711	9.7
Glaucoma primary	597	8.2

Ulceration of the cornea. The commonest causes were:—

	cases	per cent.
Local septic infection	216	29.1
Ophthalmia neonatorum	190	25.7
Phlyctenular disease	133	18.0

Interstitial keratitis caused blindness in 242 cases, 3.3 per cent., the great majority (215) being due to congenital syphilis.

Optic nerve atrophy. Acquired syphilis was the main cause with 236 cases, 32.3 per cent. Other causes were as follows:—

	cases	per cent.
Intracranial neoplasm	61	8.3
Other diseases of the C.N.S.	57	7.8
Vascular disease	52	7.1
Abiotrophies	48	6.5
Chronic septicaemia	42	5.7
Specific fevers	40	5.4

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		cases	per cent.
Congenital anomalies	...	25	3.4
Congenital syphilis	...	25	3.4

Iridocyclitis. Chronic septicaemia was the main cause with 516 cases, 72.6 per cent. Other causes were:—

Congenital syphilis	...	59	8.3
Acquired syphilis	...	35	4.9
Tuberculosis	...	22	3.1
Sympathetic ophthalmia	...	20	2.8

TABLE K (ALL SCOTLAND).
DEFECTS IN SECOND BLIND EYE ACCORDING TO
AGE OF BLINDNESS

CONDITION	CASES	AGE AT ONSET OF BLINDNESS								Not Sta- ted
		Un- der 1	1-4	5-15	16-29	30-39	40-49	50 +		
Congenital Anomalies	349	186	23	31	37	10	30	32	—	
Wounds of Eyeball	193	—	—	11	59	42	35	46	—	
Inflammatory Disease of Conjunctiva	93	19	18	8	6	7	4	31	—	
Inflammatory Disease of Lids and Lacrymal Sac	14	—	—	—	—	—	2	12	—	
Inflammatory Disease of Sclera	7	—	—	—	2	1	2	2	—	
Inflammatory Disease of Cornea, Ulcerative	737	121	70	80	59	53	84	270	—	
Inflammatory Disease of Cornea, Interstitial	242	6	10	68	57	32	36	33	—	
Other Corneal Disease	33	2	—	—	3	4	10	14	—	
Iridocyclitis	711	8	17	62	107	98	110	306	3	
Endophthalmitis, etc.	126	2	10	33	26	13	16	26	—	
Retinitis, Exudative	107	1	2	1	6	8	9	80	—	
Retinitis, Degenerative	370	9	6	26	54	41	74	159	1	
Detachment of Retina	88	—	—	4	17	11	19	37	—	
Choroiditis	318	16	5	18	36	34	45	164	—	
Optic Neuritis or Atrophy	729	38	27	83	87	109	140	244	1	
Retro-bulbar Neuritis	29	—	—	2	4	3	5	15	—	
Indeterminate	13	—	4	2	1	—	2	3	1	
Tumour, Extra-Ocular	3	—	—	—	—	—	—	3	—	
Tumour, Intra-Ocular	5	—	5	—	—	—	—	—	—	
Cataract	1,181	—	1	1	3	12	46	1,117	1	
Aphakia	118	1	—	1	3	5	12	95	1	
Other Lens Abnormalities	2	—	—	—	—	1	—	1	—	
Myopia	1,084	4	4	15	81	87	177	707	9	
Intra-ocular Haemorrhage	34	—	—	1	6	1	4	22	—	
Glaucoma	597	1	—	1	10	20	43	521	1	
Glaucoma (Secondary)	5	—	—	—	—	—	1	4	—	
Nystagmus	6	1	—	1	—	—	1	3	—	
Cortical and Tract Lesions	37	3	2	2	2	1	—	27	—	
Lid Paralysis	3	—	—	—	—	1	1	1	—	
Amblyopia ex Anopsia	10	—	—	1	1	—	1	7	—	
Others	53	2	1	—	5	7	3	35	—	
All Cases	7,297	420	205	452	673	600	912	4,017	18	

TABLE K. (ALL SCOTLAND)

Defects in second blind eye according to age group of onset of blindness.

Cataract and Glaucoma are defects of age and the onset of blindness resulting therefrom occurs at the age of 50 and over in the great majority of cases.

Myopia. Blindness is delayed until the age of 50 in 65 per cent. of the cases.

Ulceration of the Cornea. Blindness arises mainly at the two extremes of age.

Interstitial Keratitis. Blindness is spread over from the age group 5-15 and upwards.

Irido-cyclitis. The age of blindness is evenly distributed in the three age groups 16-49.

Optic Nerve Atrophy. The onset of blindness is initially heavy in the age group under 1, reaches the lowest incidence in the age group 1-4, thereafter increasing gradually to the highest incidence in the age group 50 and over.

Wounds of the Eyeball. The highest incidence occurs between the ages of 16 and 39 years.

SUMMARY.

A statistical analysis has been made of 4,087 persons certified blind at the regional clinics for Edinburgh, Dundee, Aberdeen and Inverness, and the results have been compared with the analysis for Glasgow and South-West Scotland published by Marshall and Seiler in 1942¹.

In general there is close agreement between the findings of the two investigations, and tables have been amalgamated to present as complete a record as possible of the blind position in the whole of Scotland.

The combined figures deal with 7,297 certified blind persons, but it has been estimated that the total number of the blind in Scotland is between 9,500 and 10,000.

It has been shown that the chief causes of blindness were cataract, 17.1 per cent.; myopia, 14.9 per cent.; chronic septicaemia, 10.8 per cent.; syphilis, 10.0 per cent.; and glaucoma, 8.1 per cent. Injury was responsible for only 5.9 per cent. of the cases.

An important consideration is the duration of blindness for each cause, as the percentage distribution bears no relation to the "patient years" of blindness. A new significance is given to causes operating in the early years of life and the most important causes from this point of view are chronic septicaemia, congenital anomalies, ophthalmia neonatorum and congenital syphilis which

together account for 44.5 per cent. of the total duration of blindness. Cataract, the cause of the greatest number of cases, is relegated to seventh place, with an average of 5.0 years of blindness.

Of the persons blind, 71 per cent. were over 50 years of age. Table B (All Scotland) shows 3.3 per cent. as blind in the age groups 0-15 but this is a considerable underestimation due to the lag in registration under the age of 16.

The eye trouble which led to blindness had its onset before the age of 50 in 64 per cent. of cases.

Analysis of the age distribution of the different causes shows that congenital anomalies and ophthalmia neonatorum cause blindness in 65.4 per cent. of cases in the first four years of life. Congenital syphilis is the commonest cause in the age group 5-15, accounting for 23.7 per cent. Next in importance is congenital anomalies with 13.7 per cent.

In the age group 16-29 injuries are prominent with 16.3 per cent. The other main causes in this group are congenital anomalies 16.9 per cent., chronic septicaemia 13.8 per cent., congenital syphilis 13.5 per cent., and myopia 11.9 per cent.

In the age group 30-39 chronic septicaemia takes first place with 17.3 per cent. and myopia is the cause in 13.8 per cent. Acquired syphilis 13.0 per cent. is the highest incidence in any group. Congenital anomalies drop to 9.3 per cent., and congenital syphilis with 6.8 per cent. is only half the percentage in the 16-29 age group.

Myopia is an important cause from age 40 onwards, and cataract, myopia and glaucoma together cause blindness in 59.6 per cent. at 50 years and over.

Occupations are discussed and it is suggestive from the figures that miners, metal workers, and spinners and weavers have a higher than average incidence of blindness.

When traumatic cases are omitted there appears to be no detectable difference in the relative total incidence of blindness in the sexes.

The findings of the present analysis compared with the results given by Sorsby for England and Wales are given below². Sorsby's figures relate to the following investigations and reports:

Prevention of Blindness Committee (1938).

Northern Counties Association for the Blind (1938).

Counties of London and Middlesex (Sorsby 1943).

For England and Wales 77.2 per cent. of the registered blind in 1943 were over 50 years of age; 20.8 per cent. fell in the age group 16-50 years, and 2.0 per cent. in that of 0-16 years. The comparative figures for Scotland are:—71.1 per cent. at 50 and over, 25.7 per cent. in the 16-49 age group, and 3.2 per cent. in the group 0-15 years.

Causes of Blindness	All Scotland	Prevention of Blindness Committee	Northern Counties	London and Middlesex
	7297 cases	5290 cases	10,000	9,562
	per cent.	per cent.	per cent.	per cent.
Cataract	17'1	25	33'6	21'2
Myopia	14'9	10'2	8'5	12'1
Glaucoma	8'1	11'8	10'0	14'0
Defects of congenital hereditary and devel- opmental origin ...	9'4	11'0	7'0	10'4

It is probable that some of the considerable differences in percentage are due to different methods of classification. In Scotland, *e.g.*, myopia has been noted as the main disease causing blindness when complicated by cataract. This may explain the higher incidence of myopia and the lower incidence of cataract, but an attempt at explanation can only be conjecture at present, and further statistics may make the comparison of figures more reliable.

Several difficulties have been encountered in compiling the tables, and a scheme for the annual publication of blindness statistics by the Statutory Department has been suggested.

Acknowledgments. The tables were compiled by the Statistical Branch of the Department of Health for Scotland and much patience and expert knowledge were required to overcome many difficulties.

Particular thanks are due to the head of that Branch for invaluable collaboration and advice without which the publication of this report would not have been possible.

The comprehensive report for Glasgow and South-West Scotland was kindly placed at our disposal by the authors, Dr. John Marshall and Dr. H. E. Seiler.

The report was submitted to the Sub-Committee on Prevention of Blindness of the Secretary of State's Scientific Advisory Committee and is published with their approval³.

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LOCAL TREATMENT OF INTRABULBAR INFECTIONS*†

6. Treatment of Staphylococcuspanophthalmia by Intrabulbar Injection of Penicillin

BY

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As shown in previous articles (Roenne^{1 8}) artificial intrabulbar infections can be cured by injecting chloramine-T into the vitreous body. This treatment has, however, only limited effect, as an inoculum of more than 5,000 microbes is difficult to sterilize. This being the case the testing of other bactericides was desirable, principally the sulphonamides and penicillin. From preliminary experiments it was found that sulphonamides, in conformity with the reports of other workers, have but a very slight effect, whereas penicillin proved to be particularly efficacious. Even with weak concentrations of 1-2 Oxford Units, the effect on infections in the vitreous humour was considerable. The effectivity improved with increasing concentrations of penicillin, even an inoculum of 5,000,000 virulent staphylococci was overcome and the eye preserved. It was also observed, that penicillin injected into the vitreous was extremely durable; it disappears so slowly that a bacteriostatic concentration is preserved for many hours, up to 48, all depending on the original quantity of penicillin (Roenne^{4 7}).

American workers have also taken an interest in the treatment of intrabulbar infections with penicillin. von Sallmann, for instance, tested the effectiveness of treatment of infections induced by pneumococci and staphylococci injected into the anterior chamber.

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