Ophthalmic conditions in the government schools in Egypt and their amelioration / [by A.F. MacCallan].

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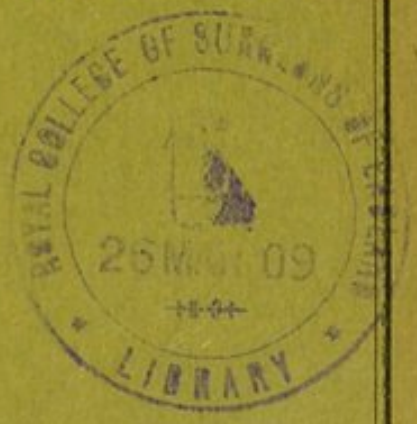

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OPHTHALMIC CONDITIONS IN THE GOVERNMENT SCHOOLS IN EGYPT AND THEIR AMELIORATION.

BY

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PART I.

AT the last Annual Meeting of the British Medical Association, I had the honour of reading a paper describing the work which had been carried on in Egypt by the ophthalmic hospitals during the previous four years.** This year, previous to giving some detailed information with regard to the ophthalmic conditions in one of the largest Government schools, I propose to report shortly on last year's (1907) clinical work at the two travelling hospitals.

The number of new patients treated was 7,446, about one-third of the actual applicants. The average number of attendances of patients under regular treatment was 19. 3,173 patients were seen who were incurable and who were sent away after the first examination.

The total number of operations performed was 6,794, of which 194 were for the removal of cataract. 2,175 cases of absolute blindness were seen, in 326 of which the cause was primary glaucoma.

The number of patients blind in one or both eyes was 8.7 per cent. of the total number examined.

2,197 persons were seen who had been operated on by charlatans for trichiasis; in most of the cases lagophthalmos had been produced without curing the trichiasis.

The work has been carried on during the last year by the two travelling hospitals originally established by Sir Ernest Cassel. One new permanent hospital, established and maintained by the Government, will be opened this year, and one permanent hospital, built partly by local effort but maintained by the Government, will be opened next year.

The Egyptian Government has been kept fully aware of the ophthalmic needs of the country during the last year by Mr. Graham, the Director-General of the Public Health Department; and it is probable that money for further ophthalmic relief will be forthcoming from the Ministry of Finance as soon as funds become available.

*A communication read in the Section of Ophthalmology at the Annual Meeting of the British Medical Association, July, 1908.

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Part II.

Means of Education in Egypt.

Education is carried on in Egypt, mainly by the Ministry of Education, by means of primary schools established in Cairo and Alexandria and in the capital town of each province; and by means of secondary schools established in Cairo and Alexandria.

At the primary schools the goal of the pupils' ambition is the primary certificate, without which he cannot enter the Government service as a clerk; and at the secondary schools the object to be attained is the secondary certificate or baccalaureate, a necessary qualification for the higher Government posts and for admission to the schools of medicine, law, etc.

The school with which I have had to deal is one of the provincial schools containing nearly 500 pupils.

Attention Previously Paid to the Ophthalmic Condition of the Schools.

The late Chief Medical Officer of the schools, Dr. Eloui Pacha, himself an ophthalmic surgeon, on various occasions drew attention to the prevalence of trachoma among the pupils, and during his tenure of office the hygienic conditions were greatly improved; but it is obvious that he himself, in the absence of a trained staff of ophthalmic surgeons, could do little or nothing in the way of treatment on a large scale.

Proposals for Ophthalmic Treatment.

Attention was drawn by me to the condition of the schools in 1904, but it was not until 1907 that my knowledge of the country and of the schools was complete enough to enable me to draft a proposal for the treatment experimentally of one school.

Financial Aid from Public Health Department.

My proposal, however, was likely to have fallen on stony soil (for the Minister of Education had no fund at his disposal which would have enabled him to assist financially in any form of treatment) had not the Director-General of the Public Health Department come to the rescue with funds which enabled me to commence at Tantah, in October, 1907, the treatment of a school of 485 boys.

Difficulties under which the work was carried out.

The novel conditions under which work had to be carried on and in deference to the educational authorities, the very much less thorough methods than those which I originally hoped to adopt, delayed the completion of any routine plan and has diminished the value of the results which I hoped to show.

It is probable that my original intentions were too drastic considering that they would no doubt have interfered to some extent with the curriculum and interrupted the normal course of instruction.

It is, nevertheless, a matter for congratulation that 87·2 per cent. of the pupils who were treated showed improvement at the end of six months (altough many of them attended very irregularly), while of the untreated only 5·9 per cent. were better at the end of the same interval.

Of the non-trachomatous scholars, 21 in all, it is noteworthy that 15 pupils became infected with trachoma during the period October to June ; these pupils, of course, had received no treatment previous to infection.

Cause of the Prevalence of Eye Disease in Egypt and Nature of the Disease.

Trachoma has been endemic in Egypt for untold centuries. It is less than the truth to say that it is widely disseminated, for it is comparatively rare to find anyone above the age of twenty years who exhibits no trace either of active or passive trachoma.

It is usually only in the presence of conjunctival irritation that infection by trachoma occurs. Now, in Egypt causes of conjunctival irritation are ever present.

The uncleanly habits of the lower classes, habits in some cases consecrated by custom, and in others aggravated by the difficulty in obtaining water ; the crowded huts with crumbling mud walls in which the poorer fellahin sleep together with their cattle ; the dust of the streets, unpaved and unwatered except in a few of the larger towns, and continually ground to powder by the trampling of the cattle which are daily driven from the huts to the fields ; the gales of daily occurrence during some periods of the year, and without which Egyptian villages would be perfect death-traps, drive this dust about until it permeates the whole atmosphere ; all these are fertile causes of conjunctivitis.

While the poorer classes by their habits, which cannot be changed by law or by decree, are constantly suffering from conjunctivitis, the ubiquitous virus of trachoma is ever ready to attack a conjunctiva, the resistance of which to infection has been lowered.

The richer classes, again, are infected by their servants, who are drawn from the highly trachomatous classes.

In addition to trachomatous conjunctivitis, there are at various periods of the year outbreaks of purulent conjunctivitis, due to the Koch-Weeks' bacillus and to the gonococcus, as well as to other organisms. Meyerhof* believes that these outbreaks occur at stated and fixed periods depending on the atmospheric

(*) Annales d'Oculistique, 1906.

temperature and on the temperature most favourable to the multiplication of these organisms.

While it is probable that the non-secreting or passive form of trachoma is not very infective, the super-imposition of a purulent conjunctivitis on a passive trachoma renders its subject infective both of purulent conjunctivitis and of trachoma. In a patient, previously healthy, infected in this way, it is usually the case that not until the conjunctivitis has run its course do the signs of trachoma manifest themselves. This is the condition which has been called acute trachoma, a term which has done more than any thing else to obscure the clinical history of the disease. It was the condition in all probability which resulted in so much blindness among the participators in the various expeditions to Egypt in Napoleonic times, who, when the acute symptoms of purulent ophthalmia had subsided, exhibited the signs of trachoma. The theory that trachoma, now a chronic disease, was formerly more virulent and of an acute type, has, in my opinion, no foundation.

Trachoma is a purely local disease caused by an unknown but specific organism from which no race is immune, and which attacks with greater severity the individuals of a heavily trachomatised than the individuals of lightly trachomatised nations. I do not, of course, suggest by this that the severity of the disease depends on anything more than on the personal habits of the individual and the conditions under which he lives.

The absence of even a relative immunity among the individuals of any nation renders the diminution of virulence theory improbable.

Stages of Trachoma.

Various forms of trachoma have been described by authors, such as Fuchs, Stellwag, Peters, Boldt, and others. These forms are well-known, but during the last three years I have found it serviceable for clinical purposes to divide trachoma into stages in accordance with the life-history of the disease.

Trachoma is a condition of the mucous membrane of the eyelids, in which gross changes occur, resulting in the formation of so-called granulations (with or without a papillary hypertrophy), which in favourable cases disappear, and are replaced by connective tissue. My classification of four degrees is based on the comparative prominence of the three features—granulations, papillary hypertrophy, and connective tissue formation.

Trachoma I is the beginning of the disease, and trachoma IV is its end when a cure has resulted (either naturally or by treatment).

Trachoma I is well described by Hourmouziades : " One finds on the conjunctiva of the tarsus and of the superior *cul-de-sac*, especially at the two extremities of the tarsus, slight roughnesses,

forming grayish or grayish-yellow islands which are semi-transparent and almost avascular, with small blood vessels converging towards them. These roughnesses are larger in the *cul-de-sac* than on the tarsus, and generally resemble grains of sago. There may or may not be a mucous discharge."

This simple form does not last very long, for after the development to a certain degree of the granulations, the conjunctiva becomes easily vulnerable; inflammation sets in, and complications with other species of conjunctivitis than trachoma occur.

This form may pass into trachoma II, or in favourable cases, or cases which have been treated, into trachoma III.

Trachoma II is the stage in which granulations are numerous and large, or in which a papillary hypertrophy is present. It may be divided in the above sense into trachoma IIa, and trachoma IIb.

Trachoma IIa.—Gelatinous granules are present all over the tarsi and in the upper fornix. In some cases the individual granulations can no longer be distinguished, and they fuse into tumour-like masses or merge into a general infiltration, the tissue assuming a peculiar glassy gelatinous appearance.

Trachoma IIb.—There is formation and hypertrophy of pseudopapillæ consisting in red raspberry-like elevations which mask more or less the typical gelatinous granules. This papillary form, as it is called, is especially marked on the upper tarsus. This form may easily be mistaken for spring catarrh and for a condition occurring as the result of any long-continued irritation or of a protracted attack of purulent ophthalmia in non-trachomatous eyes (*fausses granulations*).

Trachoma III.—In this stage cicatrisation has definitely begun, and is more or less advanced. Islands of inflamed conjunctiva or of trachomatous granules are seen to be surrounded by a network of fine lines of connective tissue. It is in this stage that necrosis of tissue often results from the pressure of the shrinking connective tissue (post-trachomatous degeneration). The necrotic tissue may become calcareous. The cicatrisation which is typical of this stage is generally supposed to be pathognomonic of trachoma, this statement, however, is not strictly true. It is often more or less marked in trachoma II, especially in the fornix.

Cicatrisation is said not to be a constant sequel of either spring catarrh or of "*fausses granulations*." Spring catarrh, however, is not uncommon in Egypt in combination with trachoma, and the subject of "*fausses granulations*" may contract trachoma.

Trachoma IV is a condition in which there is a smooth conjunctiva seamed by white lines of connective tissue. This is the stage of complete cicatrisation of the conjunctiva or of cured trachoma,

In order to arrive as quickly as possible at the stage trachoma IV, or at any rate at as late a stage of trachoma III as possible

(for the change from trachoma III to trachoma IV is a slow process), treatment is advisable and treatment may be (a) by the application of drugs to the conjunctiva; (b) by operative procedure combined with the application of drugs to the conjunctiva; (c) by operative procedure alone.

It is of course well-known that trachoma is a purely local affection depending on no diathesis or constitutional state, but purely on a local infection with an unknown but specific organism. Every effort in treatment must therefore be directed to the focus of disease.

The application of suitable drugs to the conjunctiva quickly results in an amelioration of the subjective symptoms; objectively, improvement is often long delayed, perhaps for many years, and this is true of trachoma I, trachoma II, and trachoma III. Curiously enough, it is often trachoma I which responds least readily to drug treatment.

One of the reasons why this stage, though frequently quite a slight affection, so often drags out such a long and weary course, is that surgical procedure is not sufficiently often applied.

Treatment by operation combined with drugs is commonly carried out by surgeons in Egypt for trachoma II, and it usually results in great improvement, both subjectively and objectively. The operation consists in scraping or squeezing the diseased conjunctiva and, later, in the application of mercury or silver salts.

Although by operation and the subsequent application of drugs a good deal of cicatrisation can soon be produced, and trachoma II thereby changed to trachoma III, it is difficult to induce patients who feel so much relieved to submit to further treatment in order to attain to the condition of almost complete cicatrisation trachoma IV.

Radical treatment of trachoma by operation is applicable to severe cases of trachoma II and trachoma III in which cicatrisation of the fornix has already occurred. The operation is known as Kuhnt's combined excision of tarsus and conjunctiva. It is a comparatively new operation, a description of which has not yet found its way into the text-books. Even Boldt's monograph gives no description of the operation, which, however, may be found in THE OPHTHALMOSCOPE for 1906, p. 575.

It is an operation from which I have had some exceedingly good results. The presence of granulations in the fornix contraindicates the operation, which should be performed only when fornical cicatrisation has already occurred.

The especially suitable cases are those in which there is considerable thickening of the lid in the stage trachoma IIa or trachoma IIb.

The first case I operated on was in 1906, and resulted in the almost complete loss of the patient's vision in one eye, as result of ulceration of the cornea. I was obliged to go away for

about a week immediately after the operation, and left the case in the hands of an assistant, who removed the sutures early but left a knot of silk on the lid rubbing on the cornea. If foolish mistakes of this kind are avoided, and the operation is performed with dexterity in suitable cases, the results are almost constantly satisfactory. I say almost, and not quite, because in the last case I did the superior *cul-de-sac* was much contracted and on the stretch, so that when I removed the tarsus with its superjacent conjunctiva, there was not enough conjunctiva left to bring down to the free border of the lid. I therefore brought down the conjunctiva as low as possible and put in a van Millingen's graft to cure the resulting entropium.

Facilities for ophthalmic treatment in Egypt.

To produce any real effect on an average case of trachoma by drugs alone, it is probable that two or three months' daily treatment would be necessary, and this does not necessarily mean cure but merely improvement. By operation followed by daily treatment considerable improvement can be effected in one month (change from trachoma II to trachoma III.)

Let us suppose a Government *employé* on £E10 a month has in his household ten persons, or let us say eight persons to be sure of no exaggeration, namely, himself, his wife, three children, a dependent relation, and two servants. It is almost certain that each one of them will be suffering from trachoma, it is probable that he and his wife will have trachoma III: of the three children one will have trachoma I, and the other two trachoma II; the relation probably has trachoma III and trichiasis; of the servants one has trachoma II, and the other trachoma III.

Now, what will it cost him to have the whole family treated? But perhaps such an idea is ridiculous, let us suppose that he wishes to obtain treatment for the two children with trachoma II only. He will take them to a surgeon escorted naturally by the servant with trachoma II, who hopes to obtain treatment gratis. He consults the surgeon, who tells him that the two children both require operative treatment and the daily application of drugs for a period of at least one month. The recognised fee for a visit to any doctor is one dollar, so the Government *employé* on £E10 a month is asked to expend for the treatment of the two children at least £E5 a month, even though the doctor agrees not to charge for the operation under choloroform necessary for each child, and to charge only a single fee for each child, and to charge only a single fee for each visit of the two children. Is it any wonder that the father either does not take them any more to the surgeon, but buys some drops at the chemist's, or that he continues the visits to the surgeon until some slight improvement is manifested in the children's eyes, and then promptly discontinues the visits.

A story such as the above is quite common in the towns

where skilled advice can often be had if it is paid for. But what is to be said as regards the inhabitants of the country districts who, even though willing to pay the full legitimate fees of doctors, live perhaps 5 or 10 miles from medical aid. How are they to take their children to the doctor daily?

It is also true that there has been in the past so much charlatanry practised by eye doctors, that the people of Egypt are not all by any means ready to take even a well-qualified surgeon at his own valuation, or to follow his uncorroborated advice, which usually, of course, means the disbursement of money to him for operation or treatment.

It should also be remarked as regards the class of patient which in this country seeks relief at the Government hospitals, that it is certain that the hospitals would be absolutely swamped and general clinical and public health work disorganized if even those patients alone sought treatment who were in need of operation to prevent immediate depreciation of vision.

The establishment by Sir Ernest Cassel of the Ophthalmic Hospitals, and their extension by the Public Health Department of the Egyptian Government, has made a start in the ophthalmic campaign which I do not doubt must be waged for centuries before the worst of the actual causes of ophthalmia have been removed, and for decades before existing suffering has been relieved. Even at the ophthalmic hospitals, at each of which clinical work is carried on for five and a half hours *per diem* by two or more ophthalmic surgeons assisted by a large trained subordinate staff, only 30 per cent. of the applicants can be treated sufficiently.

Certain conclusions may be deduced from a knowledge of the general ophthalmic condition of the country, which are as follows: (a) In a very large number of cases boys suffering from trachoma at Government schools are unable to obtain treatment out of school as the result of inability or unwillingness of their parents to pay for treatment, and frequently on account of lack of well-qualified surgeons. (b) The importance of training ophthalmic surgeons, as is now being done, who will later be attached to ophthalmic hospitals in various parts of Egypt for the service of the poor, and will also be at the service of the better-off inhabitants for private consultation. (c) The importance of providing, as soon as possible, the services of a skilled ophthalmic surgeon at each large school in the country.

It must, however, be borne in mind that it is even less possible to provide ophthalmic surgeons at once for every school than it is to provide money to pay for them, and that treatment carelessly or inefficiently applied does much more harm than good.

(d) The practise afforded by school treatment is of too limited a nature to keep a surgeon *au fait* with the broad outlines of ophthalmology, since although the general plan of treatment and the results are interesting the details are tiresome. The

treatment should therefore be carried on by surgeons who are doing other and definite clinical work in ophthalmology.

Part III.

Statistics.*

(i) *Incidence of trachoma in its relation to school years.*— Four complete examinations of all the pupils were made by ophthalmic surgeons during the school year 1907-1908; at each of these examinations full notes were taken of each pupil's ophthalmic condition.

Out of 485 pupils in the school at the beginning of the school year only 21 were found to be absolutely healthy, the remainder 464, or 95·67 per cent., being infected with trachoma.

The stages of trachoma (trachoma I, trachoma II, trachoma III and trachoma IV, *vide* Part II of this report) in relation to school years are shown in the accompanying table:—

TRACHOMA.

	Healthy.	I.	II.	III.	IV.	Total.
Year I	6	15	68	29	2	120
,, II	6	26	69	34	3	138
,, III ...	4	26	53	60	2	145
,, IV ...	5	11	21	42	3	82
Totals ...	21	78	211	165	10	485

It is extremely interesting to see the way in which the percentage of trachoma II, the most severe stage of the disease, diminishes as the pupils grow older, illustrating what I have said with regard to the natural cure of trachoma, even in the absence of treatment:—

Percentage of trachoma II in school years.

Year I ... 56.6 per cent.
,, II ... 50 do.
,, III ... 36.5 do.
,, IV ... 25.6 do.

Also as might be expected as a corollary to the above facts, the percentage of trachoma III increases markedly, at any rate in the third and fourth years:—

Percentage of trachoma III in school years.

Year I ... 24.1 per cent.
,, II ... 24.6 do.
,, III ... 41.3 do.
,, IV ... 51.2 do.

*At the primary schools the pupils usually remain four years, hence my reference to the four school years.

Trachoma IV is a stage which is comparatively rarely reached by school boys, only ten out of the whole school having attained to it.

If pupils are infected after their admission to the school, being previously healthy, it would be found that the proportion of healthy and trachoma I pupils was much larger in the first year than in the second, third, and fourth years; this however, is not the case.

Percentage of healthy and trachoma I pupils.

Year I	...	17.5 per cent.
,, II	...	22.4 do.
,, III	...	20.6 do.
,, IV	...	19.5 do.

Nevertheless, as will be seen later, there were 15 pupils, at first classed as healthy, who during the school year became infected with trachoma; these, however, were not all of the first year, and may have acquired the disease at home or, at any rate, out of school hours.

(ii) *Incidence of trachoma in its relation to degrees of vision.**— In this table the degrees of vision are arbitrarily divided into:

(a) Normal vision; 6/6 in each eye, a correction by glasses of ametropia of not more than + or — 6D. being allowed.

(b) Fair vision; combinations of 6/6, 6/9, and 6/12 (other than 6/6 in each eye), correction by glasses of ametropia not greater than + or — 6D. being allowed; also 6/6 in one eye and less than 6/12 (including no perception of light) in the other, correction by glasses of ametropia not greater than + or — 3D. being allowed.

(c) Bad vision. Other degrees of visual acuity not already classified.

TRACHOMA.

Vision.	Healthy.	I.	II.	III.	IV.	Total.
Normal ...	7	31	19	37	1	85
Fair	12	32	96	72	6	218
Bad	2	15	96	66	3	182
Totals	21	78	211	165	10	485

There appears to be some relationship beween severe trachoma (trachoma II) and vision. At any rate, it is seen that there is a much larger percentage of trachoma II among bad vision pupils than among the normal and fair vision pupils.

*The normal and fair vision classes represent the standard recommended recently for admission to the clerical branches of the Civil Service.

Percentage of stages of trachoma calculated with reference to total numbers of each class of vision :—

	TRACHOMA.				
Vision.	Healthy.	I.	II.	III.	IV.
Normal ...	8·23	36·47	22·36	31·76	0·01.
Fair ...	5·50	14·67	44·03	33·02	0·27
Bad ...	0·01	8·24	52·74	36·26	0·02

From this the special influence of trachoma II in producing deterioration of sight is seen. As might be expected, there are comparatively few cases of bad vision among the pupils with healthy or but slightly defective conjunctivæ.

(iii) It has been seen in the last paragraph (ii) that out of 485 pupils there were 85 only with normal vision, and boys were reckoned as endowed with normal vision even though glasses were necessary for them to attain to 6/6 in each eye.

Therefore, only 17·5 per cent. had normal vision.

Four hundred pupils had sub-normal vision, or 82·5 per cent. of the whole school ; the causes have been classified as follows :—

Corneal opacity	110
Hypermetropia, including hypermetropic astigmatism	152
Myopia, including myopic and mixed astigmatism	128
Result of disease in iris	3
lens	3
fundus	1
central nervous system ...	3
	400

Of the 280 cases classed as ametropia 73 were atropinised at different times with a 1 per cent. solution of atropin three times a day for five days and retinoscopy was performed on the sixth day. Of the remaining 207 cases the direction of the shadows in the unatropinised eye was taken as a rough guide to the variety of ametropia.

An examination of the corneæ by focal illumination in the dark-room showed that 266 had both corneæ clear ; of the other 219 :—

One cornea clear, the other nebulous	92
Nebula of both cornea	116
Adherent leucoma	11

(iv) *Other conditions of interest :—*

(a) Trichiasis.—Nineteen pupils had trichiasis in one or both eyes; two other pupils had been operated upon for trichiasis, in one of them the operation had been performed with so little skill that lagophthalmos had been produced, and he is now unable to close either eye.

(b) Ptosis.—2 cases.

(c) Squint.—41 cases; of which 25 were convergent and 16 divergent.

(d) Nystagmus.—3 cases.

(e) Blindness (pupils were considered to be blind who could not count fingers at a greater distance than one metre), 8 cases. The causes were as follows :—

(i)	Ulcer of cornea, complicated by iritis.
(ii)	" " resulting in staphyloma.
(iii)	" " " shrunken globe.
(iv)	" " " adherent leucoma.
(v)	" " " total opacity of cornea.
(vi and vii)	Traumatic cataract.
(viii)	Amblyopia.

Part IV.

Means adopted at Tantah School with a view to the improvement of the ophthalmic conditions described in Chapter III.

The staff found to be necessary for the work has been an ophthalmic surgeon, a clerk, and a trained attendant, and during the past year they have been employed exclusively for the work of the school.

This work may be divided into several classes :—

(a) Detailed examination of the eyes and sight of every pupil at the beginning and end of the school-year, and the compilation of the statistics given in Chapter III.

(b) Prophylactic treatment for all pupils exhibiting the most severe form of trachoma, *i.e.*, trachoma II. This has been effected by the daily instillation of antiseptic drops into the eyes of all pupils with trachoma II. It indicates to the subjects of this stage of trachoma that they are considered to be in a condition in which treatment is especially advisable. The pupils have also been given to understand that this treatment, although not without some benefit, is by no means thorough, and that further treatment can be obtained out of school hours, if desired.

(c) Effective or voluntary treatment after school hours. This is carried out on demand of the pupil, and includes whenever

necessary, the performance of minor operations under chloroform, for which permission has been previously obtained from the pupil's parent or guardian.

(d) The examination under atropin of scholars who, having deficient vision, are likely to have their sight improved by the prescription of spectacles.

(e) Information is given to guardians when their wards have such a diseased condition of the eyes that operative procedure (other than for trachoma which is carried out in the schools free of charge) is advisable.

(f) The head-master can send any day to the ophthalmic surgeon any pupil who develops a discharge from his eyes or who suffers from headache.

Part V.

Results of Treatment.

(i) Two complete examinations of all the pupils were made by me, one at the beginning and the other at the end of the school year, and the full clinical notes prepared by the ophthalmic surgeon in charge of the work were verified.

(ii) Prophylactic treatment was carried out daily for the 211 pupils with trachoma II. As I do not consider that it has any real influence on the disease, these pupils have been counted among the untreated.

(iii) Effective or voluntary treatment was carried out for 149 pupils at their own request.

The following table shows the treated and the untreated in the various years :—

	YEARS.				
	I.	II.	III.	IV.	Total.
TREATED, Improved	32	44	44	10	130
Not improved ...	8	4	5	2	19
UNTREATED, Improved	11	12	10	6	39
Not improved ..	57	66	85	62	270
Total	108	126	144	80	458
Transferred to other schools ...					18
Absent at last examination... ...					9
Total number of pupils ...					485

It is therefore seen that of the treated cases 87·2 per cent. showed improvement at the end of the school-year, while of the untreated cases only 5·9 per cent. showed improvement.

Of the 130 pupils who exhibited improvement 68 had been operated on in the ophthalmic room (63 under the influence of chloroform and 5 under the influence of cocain).

(iv) 73 pupils were examined for errors of refraction, after thorough atropinisation, by retinoscopy and subsequent careful subjective testing.

The results obtained were as follows :—

Spectacles ordered and being worn regularly ...	25
Spectacles ordered found unsatisfactory	2
Spectacles ordered but not obtained	31
Examination made but no spectacles ordered (not found to be useful)	15
	73

It has been found extremely difficult to get frames to fit some of the pupils, owing to the extreme length of the eyelashes, often reaching 11 millimetres, necessitating the adjustment of the lenses at a considerable distance in front of the cornea.

(v) Notices were sent to the guardians of 12 pupils informing them that operations for the cure of trichiasis were advisable.

In 4 cases operations for iridectomy, and in one case an operation for cataract, were advised, but in no case was the advice complied with.

[It has only been by the cordial co-operation with me of the head-master, Mahmoud Effendi Rouchdi, and the painstaking labour of the ophthalmic surgeon, Dr. Abdul Aziz Fahmy elAguizy, that I have been able to compile the foregoing statistics.]

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