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EXPERT COMMITTEE ON TRACHOMA

First Report

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EXPERT COMMITTEE ON TRACHOMA

First Session

Geneva, 3-8 March 1952

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The report on the first session of this committee was originally issued in mimeographed form as document WHO/Trachoma/32, 8 March 1952.

EXPERT COMMITTEE ON TRACHOMA

First Report [1]

The Expert Committee on Trachoma held its first session in Geneva from 3 to 8 March 1952.[2]

In the absence of Dr. Brock Chisholm, Director-General of the World Health Organization, the session was opened by Dr. P. Dorolle, Acting Director-General, who outlined the administrative procedures which had led to the setting-up of the committee and to the definition of its terms of reference.

Professor G. B. Bietti and Professors P. Thygeson and Y. Mitsui were unanimously elected Chairman and Vice-Chairmen respectively. Dr. H. Moutinho and Professor P. Thygeson were appointed Rapporteurs.

The agenda presented by the Director-General was approved and adopted.

Terms of Reference

The committee noted that by its terms of reference, as defined by the Third and Fourth World Health Assemblies, it was directed " to study the problem of trachoma with a view to submitting practical recommendations " as to " the possibility of successfully eradicating it by the application of modern methods of control ",[3] and, bearing in mind that " in a great number of countries trachoma and other related ophthalmias constitute an urgent health problem ", to recommend " effective preventive measures against these diseases " on an international level.[4]

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[1] The Executive Board, at its tenth session, adopted the following resolution:

The Executive Board

1. NOTES the first report of the Expert Committee on Trachoma;
2. THANKS the members of the committee for their work;
3. RECOGNIZES that at the present time there are no international regulations dealing with the control of trachoma in international traffic;
4. DECIDES to refer this report to the Committee on International Quarantine for its consideration, from the practical point of view, of section 3, dealing with "Prophylaxis of trachoma in international traffic";
5. AUTHORIZES publication of the report.

(Resolution EB10.R15, *Off. Rec. World Hlth Org.* **43**, 5)

[2] The session was preceded by a meeting of the Joint OIHP/WHO Study-Group on Trachoma, held at the Office International d'Hygiène Publique, Paris, in October 1948 (see *Off. Rec. World Hlth Org.* **19**, 27).

[3] Resolution WHA3.22, *Off. Rec. World Hlth Org.* **28**, 23

[4] Resolution WHA4.29, *Off. Rec. World Hlth Org.* **35**, 27

1. Chemotherapy of Trachoma

1.1 Introduction

1.1.1 The Expert Committee on Trachoma, basing its conclusions on the personal experience of its members, on the results of studies undertaken during the past 18 months under the aegis of WHO, and on the treatment of several thousands of patients, is of the opinion that the majority of cases of trachoma can be cured by chemotherapy and antibiotic therapy. The clinical forms of the disease, both acute and chronic, are very varied. Nevertheless, the therapeutic methods described below make it possible to treat this disease with every chance of success. These methods have, moreover, the advantage of acting effectively on other inclusion conjunctivitis as well as on associated infections and epidemic conjunctivitis.

1.1.2 The committee recognizes that at the present stage of knowledge the most effective treatment for trachoma is the simultaneous use of certain antibiotics with sulfonamides, the former being administered locally, and the latter orally.

1.1.3 Such mixed treatment calls for the frequent application (every 2 or 3 hours) of antibiotics to the conjunctival sac and for the daily administration of 40-50 mg of sulfonamides per kg of body-weight, divided into two to (preferably) four doses.

1.1.4 *Antibiotics*

1.1.4.1 Aureomycin and terramycin are considered particularly active on the causal agent of the disease, and it has been recognized that these two antibiotics also act on most of the above-mentioned conditions.

1.1.4.2 For reasons of convenience in application, to ensure adequate diffusion in the conjunctival sac, for the sake of economy, and to ensure the use of a stable product these antibiotics must be applied locally, preferably in the form of a 1% (minimum) ointment.[5] Systemic administration is not to be recommended.

1.1.4.3 In particular cases (superimposed acute conjunctivitis, secondary bacterial infections) the association of other therapeutic agents may be considered.

1.1.5 *Sulfonamides*

The committee recognizes that the sulfonamides are active against trachoma. Nevertheless, in view of their toxic properties and the variations

[5] Present solutions are unstable.

of tolerance from one person to another, it is advisable to use the least toxic products: e.g., potassium and sodium salt of *p*-sulfonamido-phenyl-azosalicylic acid, sulfacetamide, polysulfonamide mixtures, dimethyl-sulfanilamido-isoxazole, etc. These are best given orally.

1.2 Mass treatment of uncomplicated trachoma

1.2.1 In view of the disadvantages in the use of sulfonamides mentioned above and the relatively high cost of long-term treatment with these products, the committee is of the opinion that in mass therapy their use should be confined to cases which prove resistant to antibiotics.

1.2.2 *Scheme for mass treatment*

1.2.2.1 Omitting the acute forms of trachoma and its corneal complications of a vascular, infiltrating, or ulcerating type, for which short-term treatment is generally sufficient, and excepting cases where, because of local circumstances or for economic reasons, the mixed treatment described above (see section 1.1.3) cannot be applied, the minimum therapy of which details are given below may be administered with every hope of obtaining a large percentage of cures:

(*a*) Application of aureomycin or terramycin 1% ointment four times daily without interruption for a period of two months.

(*b*) Evaluation of results and selection of resistant cases.

(*c*) For the resistant cases only, institution of the mixed treatment, local treatment being continued without interruption but with the addition of one of the above-mentioned sulfonamides given orally in a dose of 40-50 mg per kg of body-weight daily. This dose must be administered in at least two parts and must be adjusted with respect to the number of daily administrations: the larger the number the smaller the dosage. The doses should be spaced out as regularly as possible over the 24 hours and should be continued for three consecutive weeks. The usual precautions should be taken to detect reactions among those under treatment.

(*d*) Depending on the change in the clinical picture, and in the absence of cure, a second and even a third course of sulfonamide treatment similar to the first should be given, with an interval of ten days between each course.

1.2.2.2 Every endeavour should be made to continue the local application of antibiotics throughout the whole period of sulfonamide treatment, including the intervals.

1.3 Surgery and chemical desquamatives

1.3.1 The committee considers that as more and more effective medical treatment of trachoma becomes available to ophthalmologists, mechanical adjuncts will become less and less necessary. Nevertheless, in certain cases, very gentle and non-traumatizing expression of soft follicles which have a tendency to open spontaneously is permissible, as is also the painting of the conjunctiva with slightly caustic solutions (e.g., 1% or 2% silver nitrate, copper sulfate, etc.), or the instillation of such solutions into the conjunctival sac.

1.3.2 These measures must now be considered as complementary to purely medical treatment and as no longer needed except in a limited number of cases in which they may accelerate cure. In any case, they call for particular conditions (the existence of adequate equipment, sufficient medical personnel, etc.), and in mass treatment they may be dispensed with without any appreciable disadvantage.

1.3.3 Naturally, other methods of treatment (surgery, etc.) are still needed for the cicatricial sequelae of trachoma (trichiasis, entropion, corneal leukoma, etc.).

2. Methods of Trachoma Control Applicable in Underdeveloped Countries

2.1 Basic principles

2.1.1 Any programme for trachoma control must be directed not only against the disease itself but also against related and associated conditions and against epidemic conjunctivitis. In this section of the report, therefore, the term " trachoma " will refer to these eye diseases as a whole.

2.1.2 The basic principles of trachoma control include :

(*a*) case-finding and treatment of patients ;

(*b*) rational health education of the people, adapted to their particular conditions ;

(*c*) destruction of possible vector agents, and other environmental sanitation measures.

2.1.3 All such action has a prophylactic value.

2.1.4 The cost of trachoma control is relatively low since, in spite of the large number of staff required, the price of the necessary drugs is moderate. From the point of view of the community, the cost is very

rapidly more than compensated by the considerable economic value of the restoration to health of the workers.[6]

2.2 General organization

The committee considers that action against trachoma should include the following three elements :

(1) appropriate legislation ;
(2) health education of the people ;
(3) specialized control.

2.2.1 *Legislation*

Legislation should be adapted to the economic, social, cultural, and administrative development of the country, and should provide a legal basis for the organization of trachoma control in its various forms.

2.2.2 *Health education of the people*

2.2.2.1 The committee considers that health education is of primary importance in the prophylaxis of the disease, and that it should be developed to the greatest possible extent by all available means and by modern propaganda techniques adapted to local conditions. The interest of schoolteachers should be aroused and their close collaboration obtained. The aim should be to develop a sense of collective and individual responsibility with regard to trachoma control.

2.2.2.2 Teaching should emphasize the dangers and serious consequences—individual and familial, social and national—of the disease ; it should encourage the patient to obtain treatment for himself and for his family by pointing out that such treatment is both available and effective.

2.2.3 *Organization of specialized control*

2.2.3.1 The committee considers that for the control of trachoma to be effective, the existence of a permanent network of fixed and mobile centres, distributed over the whole of the territory in which trachoma is endemic, is desirable.

2.2.3.2 This network should be under the technical direction of a central organization, an institute of trachoma and eye diseases, which should act as the co-ordinating body, and as a centre for study, scientific research, and teaching ; it should provide facilities for consultation, treatment, and hospitalization.

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[6] In Tunisia, for example, a country of 3,500,000 inhabitants, about 25,000,000 working days per year are lost through trachoma and other eye diseases.

2.2.3.3 The network of local centres should include, in built-up areas, hospital services and specialized or general dispensaries according to local needs; in rural areas, specially equipped mobile units will be needed.

2.2.3.4 Hospital establishments and ophthalmological dispensaries must be under the control of medical personnel with adequate ophthalmological training. In addition to medical personnel in the narrow sense, nursing personnel (male and female nurses, visiting nurses, social workers, etc.) should be used to the fullest possible extent. They should have received ophthalmological training, adapted to their duties, in addition to their general training. Male and female teachers with an elementary but practical training in ophthalmology should also be employed. In fact, anyone with sufficient education and having received elementary training in ophthalmology could make a useful contribution to the campaign.

2.2.3.5 The network of centres for the control of trachoma and other eye diseases should be developed progressively, in the first instance covering effectively a selected region. The region should then be extended gradually as facilities permit. In the establishment of the network, both in the initial region and in the regions to which the services will gradually extend, it will be advisable to make the fullest possible use of existing institutions and of their possibilities for adaptation and development.

2.2.3.6 The ophthalmological services should be developed in complete co-ordination and co-operation with the other public-health services, in order to make it possible for the ophthalmological services to be adapted to other uses in the event of favourable developments with regard to the endemicity of eye diseases.

2.3 Large-scale control projects

2.3.1 The committee recognizes the effectiveness of large-scale projects for the control of trachoma and other infectious eye-diseases when the incidence is high. These projects may be undertaken without the previous existence of a complete network of ophthalmological centres, but will be more completely effective when supported by an organization of the kind mentioned above (see section 2.2.3).

2.3.2 The aim of the control projects is to reduce the sources of infection and the number of cases in the specified area.

2.3.3 The area covered by a project should depend on the personnel and equipment available.

2.3.4 In order to ensure success, an effort should be made to reach all sufferers from the disease, but in particular infants and children, since they are more frequently attacked than adults by the more infectious and more easily curable forms of the disease. It is in fact known that children suffer

from more active forms of trachoma than adults, in whom cicatrization is generally in a more advanced stage. If these active forms can be eliminated, the possibilities of reducing the incidence of the disease will be considerable.

2.3.5 Given present therapeutic methods, a project, to be effective, should be continued for at least two years.

2.3.6 All completed projects should be followed up, at regular intervals of not less than one year, by investigations to see whether the results achieved are being maintained and to determine whether or not the project should be repeated.

2.3.7 There is no necessity for the responsible team to be immobilized. Treatment begun by team members can in many cases be continued by local personnel (nurses, teachers, etc.) under the periodic control of the team in charge of the circuit.

2.4 Control of vectors

2.4.1 It is desirable that, in addition to treatment of patients, projects should include the control of flies and other possible vectors. Such measures, however, come within the framework of general hygiene and environmental sanitation and should not be a charge on the specific therapeutic undertaking.

2.4.2 The committee considers that fly control is really efficacious, at least in the prophylaxis of acute conjunctivitis.

2.4.3 It is recommended that studies be continued for the purpose of determining whether, in addition to the important role they play in the dissemination of seasonal conjunctivitis, flies do not also play a part in the propagation of trachoma.

2.5 Vaccination against acute conjunctivitis

In countries where seasonal epidemic conjunctivitis due to Koch-Weeks bacillus occurs it would be desirable to resume experiments in vaccination against these infections.

3. Prophylaxis of Trachoma in International Traffic

3.1 The committee wishes above all to make it quite clear that, in the present state of knowledge, trachoma should be considered as only slightly contagious.

3.2 The committee is of the opinion that a clear distinction should be made in both international and national sanitary legislation between measures applicable to travellers in transit and measures applicable to immigrants. It would be desirable that the measures applicable to travellers in transit should be extended to temporary visitors.

3.3 Travellers in transit

3.3.1 In its *chronic forms*, the infectivity of trachoma is sufficiently low to justify persons suffering from it being accepted as travellers in transit without their being subjected to quarantine measures.

3.3.2 In view of the greater infectivity of the *acute forms* (secreting forms) of trachoma, it is desirable that persons suffering from them be subjected, before undertaking an international journey, to treatment which would make them non-contagious. Such non-contagious persons may be subjected to " surveillance " [7] (in the quarantine sense of the term) by the sanitary authorities of the country through which they are passing or in which they are staying temporarily.

3.3.3 The existence of complications and corneal or palpebral sequelae (such as pannus, ulcers, trichiasis, entropion, etc.) is not in itself to be considered as an indication of infectivity or non-infectivity of the disease. In this connexion, only the stage reached by the concomitant trachoma (Tr I, II, III, or IV) [8] must be considered.

3.3.4 Modern chemotherapy and antibiotic therapy may also—and often relatively quickly—bring about cure of most of the complications. Certain sequelae need to be dealt with by ocular surgery.

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[7] The International Sanitary Regulations (WHO Regulations No. 2) contain the following provisions with regard to " surveillance " (Article 27) :

" 1. A person under surveillance shall not be isolated and shall be permitted to move about freely. The health authority may require him to report to it, if necessary, at specified intervals during the period of surveillance. . . . the health authority may also subject such a person to medical investigation and make any inquiries which are necessary for ascertaining his state of health.

" 2. When a person under surveillance departs for another place, within or without the same territory, he shall inform the health authority, which shall immediately notify the health authority for the place to which the person is proceeding. On arrival the person shall report to that health authority which may apply the measure provided for in paragraph 1 of this Article."

(*World Hlth Org. techn. Rep. Ser.* 1951, **41**, 16)

[8] See section 3.5, page 12.

3.4 Migrants [9]

3.4.1 It is recommended that candidates for emigration be examined in their countries of origin on two occasions separated by an interval of not less than two months.

3.4.2 In the first of these examinations (preselective) any person suspected of trachoma would be sent back to the competent ophthalmological service for examination and treatment if necessary. The therapeutic methods at present available should, in most cases, effect a cure.

3.4.3 Persons subjected to this procedure should be provided with a certificate to the effect that they are not suffering from trachoma, or a certificate of cure, issued by the competent ophthalmological authorities,[10] for production at the second examination a short time before departure.

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[9] A Migration Conference was convened in Naples, Italy, in October 1951 under the auspices of the International Labour Organisation. Observers from WHO were present. The recommendations made in sections 3.4 and 3.5 of this report were formulated after consideration of the resolutions adopted by this Conference, especially of the following:

The Conference,

Considering the Resolution on basic principles and criteria for medical examination of migrants adopted by the Conference,

Considering the need for consulting specialists on problems involved in application of certain uniform criteria recognised by the said Resolution, when candidates for emigration are suffering from diseases such as tuberculosis, venereal disease or trachoma,

Recommends that the Governing Body of the International Labour Office instruct the Director-General of the International Labour Office:

(a) to define, in collaboration with the other competent international organisations, the extent of these problems;

(b) to consider, with the Director-General of the World Health Organisation, the possibility of placing these problems on the agenda of the committees of experts of this Organisation at their next meetings with a view to communicating thereafter to the States concerned any recommendations which may be made by these committees.

(International Labour Organisation (1951) *Note on proceedings of the Migration Conference (Naples, 2-16 October 1951)*, p. 40 (Document C.Mig/I/11/1951))

In addition, the WHO Executive Board, at its ninth session, adopted the following resolution:

The Executive Board,

Having considered the report on "Basic principles and criteria for medical examination of migrants" and the resolutions therein as adopted by the Migration Conference convened by the International Labour Organisation at Naples in October 1951,

1. REQUESTS the Director-General to communicate the basic principles and criteria to Member Governments for consideration by their national health authorities with a view to utilizing them as a guide for the medical examination of migrants; and

2. REQUESTS the Director-General to collaborate with the International Labour Organisation in making further studies relating to this subject as requested by that organization.

(Resolution EB9.R15, *Off. Rec. World Hlth Org.* **40**, 6)

[10] Bilateral agreements could be negotiated between countries of immigration and countries of emigration establishing the qualifications required of physicians or institutions whose certificates of the absence or cure of trachoma, issued to immigrants in their country of origin, would be recognized as valid.

3.4.4 The committee considers that in certain circumstances a country of immigration could admit subjects suffering from evolutive trachoma if such a country were in a position to carry out or continue effective treatment. Such countries could place trachomatous immigrants under " surveillance " (in the quarantine sense of the term).

3.4.5 Corneal complications and sequelae should not be considered reasons for refusing immigration to a worker applying for it, or for refusing employment to an immigrant worker unless, after treatment and cure, his visual acuity has remained below the generally accepted standards.

3.5 Practical nomenclature recommended for administrative and quarantine purposes

3.5.1 Numerous difficulties are encountered in the interpretation of medical certificates by health and quarantine officials, owing to :

(*a*) the absence of any universally adopted classification of the various stages of trachoma, the variations in terminology used by ophthalmologists, as well as the use of certain terms which are difficult to translate ;

(*b*) the existing uncertainty with regard to the degree of infectivity of trachoma in its various stages.

3.5.2 In view of the foregoing, the committee is of the opinion that :

(*a*) for administrative or quarantine purposes the MacCallan classification in its most simple form (Tr I, II, III, IV) [11] should be universally adopted to the exclusion of any other system of classification ;

(*b*) in the present state of knowledge, stages I, II, and III of the disease (Tr I, Tr II, and Tr III) should be considered as more or less infectious ; stage IV (Tr IV) should be considered as non-infectious.

4. Observations on International Co-operation in Trachoma Research

4.1 The committee recognizes :

(1) the desirability of establishing criteria for typical uncomplicated trachoma in its various stages as it occurs in various parts of the world ;

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[11] Tr I = trachoma at onset
Tr II = established trachoma (including florid forms)
Tr III = cicatrizing trachoma
Tr IV = cicatrized or healed trachoma.

(2) the need for determining regional variation on the basis of
   (*a*) incidence,
   (*b*) age of onset,
   (*c*) mode of transmission,
   (*d*) histopathology,
   (*e*) clinical course and resultant disability,
   (*f*) incidence and effect of associated and predisposing factors, and
   (*g*) response to treatment.

4.2 The committee suggests that WHO undertake the publication of a comprehensive monograph dealing with the various aspects of trachoma throughout the world and its differential diagnosis. The individual members of the committee agree to provide the material for such a monograph.

4.3 The committee stresses the importance of providing by such means a clearly defined picture of the various aspects of trachoma and associated diseases as they occur in different parts of the world :

(*a*) as a basis for planning general programmes of research,

(*b*) in arranging for direct collaboration between workers in regions where conditions are comparable, and

(*c*) as a standard for correlating and interpreting the results of treatment.

4.4 The committee recognizes the important role already played by WHO in facilitating the interchange of information on trachoma among existing members of the WHO Expert Advisory Panel on Trachoma and between them and other interested workers, and recommends a continuation and elaboration of this existing service.

4.5 It further suggests that information should be obtained on the research potential of all university, governmental, and other laboratories where research on the trachoma agent and allied viruses is being conducted, with a view to enlisting the interest and aid of additional virologists.

4.6 In the committee's opinion, the usefulness of the Panel could not be other than enhanced by extending its geographical representation and by the addition of one or more virologists interested in and familiar with the group of diseases caused by related viruses.

4.7 In view of the present scarcity of trained virologists, the committee recommends that fellowships be established for the training of an adequate number of young ophthalmologists in virus research.

4.8 The committee deplores the fact that many important articles published in periodicals on the basic sciences and in non-ophthalmological journals escape the notice of trachomatologists for long periods and suggests that

a special effort be made by WHO, through its Expert Advisory Panel on Trachoma and by other means, to provide an abstract service in two languages which would lead to more rapid diffusion of important advances in this field.

4.9 The committee stresses the importance of regional conferences on trachoma, and recommends that members of the Panel make special efforts to obtain the inclusion of trachoma papers and symposia in programmes of both national and international meetings such as the International Congress of Ophthalmology, the Pan American Congress of Ophthalmology, etc.

4.10 The committee recognizes the necessity of standardizing, as far as possible, the recording of observations and results of investigations, particularly as related to

(*a*) the clinical features of trachoma, and

(*b*) the morphology of the causative agent and its inclusions.

4.11 The committee recommends that, after a suitable review of regional research potential, individual investigators and institutions in various parts of the world should undertake and co-ordinate research on designated problems (see Annexes 1 and 2, pages 19 and 21) for which they are particularly qualified and geographically located.

4.12 The committee suggests that its next session should be convened in New York City, N.Y., USA, in September 1954, at the time of the XVIIth International Congress of Ophthalmology, and that the following subjects should be included in the agenda:

(*a*) the results of mass treatment of trachoma by means of chemotherapy and antibiotic therapy;

(*b*) etiology and pathogenesis of the disease;

(*c*) pathology of trachoma;

(*d*) trachoma and labour.

4.13 The committee draws the attention of investigators to the subjects for study listed in Annexes 1 and 2 of the present report—subjects calling for either collective, co-ordinated research (Annex 1) or for individual research (Annex 2).

5. Classification of Trachoma

5.1 The committee considers that it has already met the needs of administrative and statistical control and of modern medico-social requirements by the simplified classification previously proposed (see section 3.5). On

the other hand, it is necessary to meet clinical and scientific needs. For this purpose the committee recommends the adoption of a system of notation of the clinical stages of the disease which would make precise recording possible and future studies comparable.

5.1.1 This system is based on the universally known classification of MacCallan, which, in the opinion of the committee, should continue to form the basis of any other classification of trachoma.

5.1.2 A certain number of notation systems which have been proposed in recent years afford indisputable advantages by adding to the chronological classification a reflection of the clinical picture of the illness.

5.2 The committee therefore proposes that some of these new features be embodied in the MacCallan classification for the purpose of establishing a new classification satisfying present-day needs and making it possible to record the evolution of patients' symptoms by means of concise but sufficiently detailed formulae.

5.2.1 The following are the elements of this notation given in alphabetical order of the proposed symbols :

Roman numerals I, II, III, and IV = "stage of the disease according to the MacCallan classification "

C = " scars "

F = " follicles "

i = " corneal infiltration " (extent in millimetres from the limbus)

m = " mixed form " (trachoma in association with another conjunctival disease) ; the letter " m " should be placed above and to the right of the Roman numeral indicating the stage of trachoma

P = " papillae "

prF = " prefollicular "

Tr = " trachoma "

V = " corneal vessels " (extent in millimetres from the limbus)

v = " verification of cure by a recognized test " (see Annex 1, paragraph 14, page 20)

< = " less than ... "

> = " more than ... "

±, +, ++, +++ = " severity of the conjunctival manifestations "

5.2.2 In administrative documents, only the indications of the basic stages of trachoma should be used (see section 3.5).

Examples

Tr I = trachoma at onset
Tr II = established trachoma (including florid forms)
Tr III = cicatrizing trachoma
Tr IV = cicatrized or healed trachoma

5.2.3 For documents requiring more precise clinical and scientific recording of observations the additional symbols should also be used.

These symbols, enumerated under section 5.2.1, should be used normally in the following order:

(1) Stage of trachoma (Tr I, Tr II, Tr III, Tr IV)
(2) Presence of an associated disease, mixed form (^{m})
(3) Indication of verification of cure by a recognized test (v)
(4) Presence of scars (C) *
(5) Presence of follicles (F) * or of prefollicular lesions (prF)
(6) Presence of papillae (P) *
(7) Presence of corneal vessels (V) **
(8) Infiltration of the cornea (i) **

* The signs $\pm$, +, ++, or +++ placed in front of the symbols, should be used to show the severity of the lesions; the signs $<$ or $>$ to show their relative importance.

** These symbols should be followed by a number, placed above and to the right of the symbol in question, expressing in millimetres the extent of corneal involvement.

Examples:

Tr I + prF	Trachoma at onset, of slight severity, before appearance of visible follicles
Tr II ++ F$<$P V^4 i^2	Florid trachoma of moderate severity with follicles less abundant than papillae; corneal vessels and corneal infiltration extending 4 mm and 2 mm, respectively, from the limbus
Tr II +++ F V^2 i^1	Florid trachoma of great severity with numerous follicles; corneal vessels and corneal infiltration extending 2 mm and 1 mm, respectively, from the limbus
Tr II^m +++ F$>$P V^5 i^4	Florid trachoma of great severity associated with conjunctivitis or some other conjunctival disease, with follicles more numerous than papillae; corneal vessels and corneal infiltration extending 5 mm and 4 mm, respectively, from the limbus

Tr III +++ C + P V^5 i^4	Trachoma in process of cicatrization with severe scarring and with some papillae; corneal vessels and corneal infiltration extending 5 mm and 4 mm, respectively, from the limbus
Tr III ± C ++ F V^5 i^4	Trachoma in process of cicatrization with very slight scarring and numerous follicles; corneal vessels and corneal infiltration extending 5 mm and 4 mm, respectively, from the limbus
Tr IV +++ C V^4	Cicatrized trachoma with severe scarring; corneal vessels extending 4 mm from the limbus
Tr IV v ++ C V^3	Cicatrized trachoma, verified by a recognized test of cure, and showing moderately severe scarring; corneal vessels extending 3 mm from the limbus
Tr IV v V^2	Healed trachoma, verified by a recognized test of cure, and without visible cicatrization; corneal vessels extending 2 mm from the limbus

5.2.4 *Complications and sequelae* should be added in words at the end of the formula.

Example :

Tr III + C + F V^5 i^4 trichiasis

Trachoma in process of cicatrization with slight scarring and some follicles; corneal vessels and corneal infiltration extending 5 mm and 4 mm, respectively, from the limbus; presence of trichiasis

5.2.5 *Special clinical forms of the disease* should also be indicated in words at the end of the formula.

Example :

Tr III + C + F V^5 i^4 { lardaceous / gelatinous / diffuse

5.2.6 Microscopical evidence of the trachoma virus, e.g., inclusion and extracellular bodies, should be added in brackets after the formula.

6. Miscellaneous

6.1 Onset of trachoma—various forms

6.1.1 The committee recognizes the scientific and practical interest attaching to the determination of the most usual form (acute or chronic) of onset of trachoma in the various parts of the world, and the importance of avoiding confusion in the diagnosis of trachoma and of acute conjunctival disorders.

6.1.2 It is of the opinion that in countries in which trachoma is endemic it is desirable that a systematic microscopic examination be made of conjunctival scrapings and smears from conjunctival secretions of patients presenting a clinical picture of acute conjunctival infection, for the purpose of discovering Halberstaedter–Prowazek bodies.

6.2 Keratoplasty

6.2.1 The committee considers that the practice of keratoplasty is an appropriate measure for the remedying of the disastrous consequences of certain eye diseases affecting the cornea.

6.2.2 It therefore expresses the warm hope that in all countries in which these diseases are prevalent and in which so far no legislation authorizing the general practice of this method of combating blindness exists, governments should institute legislation permitting the removal of the necessary material from corpses and facilitating the institution and functioning of organizations for the development of this branch of ophthalmology.

Annex 1

PROBLEMS CONSIDERED SUITABLE FOR CO-OPERATIVE RESEARCH ON AN INTERNATIONAL LEVEL[1]

(1) The development of a means of obtaining trachoma virus in quantity. This is the most important research problem now existing in relation to trachoma, as the study of the immunological, biochemical, and other properties of the virus of necessity depends upon it. It may be possible to accomplish this by tissue-culture techniques, by inoculation of chick-embryos, or by transmission to laboratory animals. The various growth-promoting effects of cortisone or related substances must be explored in both tissue-culture and experiments with small animals.

(2) The morphological, biochemical, and immunological properties of trachoma virus. Does it produce a soluble toxin comparable with the toxins produced by other members of its virus group?

(3) The relationship of trachoma virus to inclusion-conjunctivitis virus and to other members of the trachoma—psittacosis—lymphogranuloma-venereum group of viruses. Transmission of the virus to the genito-urinary tract.

(4) Characteristics and classification of the developmental stages of the inclusion body. Morphology and biochemistry of its components.

(5) Studies of incipient trachoma with emphasis on the incubation period and on changes of cornea and limbus demonstrable by means of the slit-lamp.

(6) Re-evaluation of the corneal signs of trachoma with particular reference to the limbal follicle.

(7) Differentiation between pure and secondarily infected trachoma in its various stages on the basis of clinical signs.

(8) Mechanism of action of the sulfonamides and antibiotics on trachoma.

(9) Mechanism of action of such non-specific chemical agents as silver nitrate and copper sulfate.

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[1] Subjects for research are obviously not restricted to this list.

(10) Study of possible factors concerned in racial resistance with particular reference to pigment in conjunctival and corneal epithelial cells.

(11) Study of the transmission of trachoma in man and in experimental animals ; the role of secondary infection ; the role of flies and other vectors ; the role of economic levels.

(12) Effect of ACTH and cortisone on clinical and experimental trachoma.

(13) Study of non-trachomatous follicular conjunctivitis.

(14) Study of latency in trachoma. The development of clinical and microbiological tests for cure :

(*a*) the fluorescein test, by instillation ;

(*b*) the cortisone test ;

(*c*) other tests.

Annex 2

PROBLEMS CONSIDERED SUITABLE FOR INDIVIDUAL RESEARCH [1]

Considerable research has already been carried out on the problems mentioned below ; the necessary evaluation and continuation of this work could perhaps best be effected by individual laboratories or investigators working independently.

(1) Reinfections.

(2) Latency in trachoma. Incidence of reactivation of latent trachoma as compared with incidence of reinfection in countries where trachoma is endemic.

(3) Correlation between conjunctival and corneal signs of trachoma. Factors predisposing to greater relative involvement of either conjunctiva or cornea.

(4) Factors underlying location of scar formation. Does it parallel the localization of the virus in the overlying epithelium ?

(5) The lacrimal sac in trachoma. Role of the trachoma virus in dacryocystitis. Role of secondary bacterial infection in lacrimal sac involvement.

(6) The acute and chronic types of follicular conjunctivitis and their differentiation from trachoma.

(7) Comparison of clinical signs of trachoma contracted in infancy with those of trachoma contracted in adult life and old age.

(8) The cytology of the trachomatous follicle as compared with that of the non-trachomatous follicle, especially when co-existent. Evidence for the existence of toxins produced by the virus.

(9) The cytology of the epithelium in trachoma. Are specific changes produced which can be used in differential diagnosis ?

(10) Keratinizing cell-changes in vitamin-A deficiency and in keratitis sicca as related to intracellular growth of trachoma virus. Clinical and experimental studies. Possible role of *Corynebacteria* in xerosis.

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[1] Subjects for research are obviously not restricted to this list.

(11) Complement-fixation, conglutinating complement-absorption, and haemagglutination studies on trachoma and related diseases.

(12) Study, by differential centrifugation or from culture when this method becomes available, of the antigenic properties of the virus in material concentrated from conjunctival scrapings.

(13) The development of rapid methods for the detection of inclusion bodies :

(*a*) thick scrapings ;

(*b*) iodine stain ;

(*c*) the phase microscope.

(14) Cytological variations of possible diagnostic value.

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