

WORLD HEALTH
ORGANIZATION

ORGANISATION MONDIALE
DE LA SANTÉ

SECOND WORLD HEALTH ASSEMBLY

A2/24 ✓
13 June 1949

ORIGINAL : ENGLISH

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REPORT ON THE THIRD SESSION OF THE
EXPERT COMMITTEE ON BIOLOGICAL STANDARDIZATION
(Provisional Agenda item 8.16.1.1)

The Director-General transmits to the Second World Health Assembly the Report on the third session of the Expert Committee on Biological Standardization.

This report was noted by an ad hoc Committee of the Executive Board at a meeting held on 10 June 1949, in accordance with the instructions of the Executive Board at its third session.^{1,2}

The Health Assembly may wish to adopt the following resolution:

The Second World Health Assembly

NOTES the Report on the third session of the Expert Committee on Biological Standardization:

REFERS this report to the Executive Board for consideration and action.

1 Off. Rec. World Hlth Org. 17, 13

2 Any comments of the ad hoc committee will be attached as an addendum to this document.

WORLD HEALTH
ORGANIZATIONORGANISATION MONDIALE
DE LA SANTÉEXPERT COMMITTEE ON
BIOLOGICAL STANDARDIZATIONWHO/BS/70
13 May 1949

ORIGINAL: ENGLISH

REPORT ON THE THIRD SESSION

Held 2 - 7 May 1949, in London

The Expert Committee on Biological Standardization met in London on the premises of the Medical Research Council, 26 Old Queen Street, from 2 to 7 May 1949. The following were present:

Members:

Professeur E. Grasset	Directeur de l'Institut d'Hygiène Geneva
Dr. A. A. Miles	Director Department of Biological Standards National Institute for Medical Research (Medical Research Council) London
Dr. J. Ørskov	Director State Serum Institute Copenhagen
Major-General Sir Sahib Singh Sokhey	Director Haffkine Institute Bombay
Dr. W. Aeg. Timmerman	Director Rijks Instituut voor de Volksgezondheid Utrecht
Professeur J. Tréfouël	Directeur de l'Institut Pasteur Paris
Dr. M. V. Veldee	Chief, Biologics Control Laboratory National Institutes of Health (US Public Health Service) Bethesda, Md

Co-opted Members:

Dr. J. Bretey	Chef de la Division de la Tuberculose Institut Pasteur Paris
Dr. J. Chev�	Directeur Annexe de l'Institut Pasteur Larocbe-Beaulieu (Dordogne)
Dr. N. K. Jerne	Acting Chief Department of Biological Standardization State Serum Institute Copenhagen

Secretary

Dr. R. Gautier

Assistant Director-General of the
World Health Organization

In addition, one expert on blood groups (Dr. E. R. Race, Director Blood-Group Research Unit, National Institute for Medical Research, London), two experts on endocrinology (Dr. A. S. Parkes, National Institute for Medical Research, London and C. Hewett, Organon Laboratories, Glasgow), two experts on immunology (Dr. A. Felix, Central Enteric Reference Laboratories, Colindale, London and Dr. D. A. Long, National Institute for Medical Research, London) one expert on pharmacology (Dr. W. L. M. Perry, National Institute for Medical Research, London), and one expert on Vitamin B₁₂ (E. Lester Smith, Glaxo Laboratories, Greenford, Mx) attended part of the session.

The Assistant Director-General outlined the steps taken to implement the decisions of the First World Health Assembly* regarding the establishment of an expert committee on Biological Standardization.

Dr. Timmerman was elected chairman and Dr. Miles rapporteur.

The chairman felt sure that the committee would first wish to express its sorrow for the recent death of Mr. P. Bruce White, who attended the second session of the Interim Commission's Expert Committee as a specialist on cholera. The committee would remember Mr. Bruce White not only as an outstanding bacteriologist and serologist, but also as a good friend.

1. Ogawa and Inaba Cholera Vaccines and Diagnostic Antisera
(Doc. WHO/BS/52, Doc. WHO/BS/66 and Doc. WHO/BS/69)

The committee noted that the recommendations made by the Expert Committee on Biological Standardization of the Interim Commission of WHO at its second session, regarding the provisions of reference prophylactic vaccines, of freeze-dried living cultures, and of freeze-dried antigens for the production of diagnostic antisera in rabbits, had been implemented. In the light of recent advances in the antigenic analysis of the cholera and other vibrios, however, the committee decided to defer the establishment of the freeze-dried antigens for rabbit immunization as reference preparations, pending a reinvestigation of the strains employed.

The committee recommends that the suitability of the Ogawa and Inaba prophylactic vaccines as reference preparations should be tested by comparative assay against three "unknown" vaccines of different potencies. Major-General Sir Sahib Singh Sokhey agreed to prepare the unknown vaccines. Laboratories in five countries will take part in the assay.

2. Anti-Pertussis Vaccine (Docs. WHO/BS/62 and WHO/BS/54)

The committee decided to defer the establishment of an international standard preparation for an H. Pertussis vaccine until sufficient information was available on the following points:

- (1) The relation between immunizing potency in laboratory animals and in man. It was noted that information on this point would probably be forthcoming within a year.
- (2) The consistency of results obtained by independent workers when several vaccines are compared with a standard preparation.

Among the difficulties in reaching agreement about the potency of pertussis vaccines as measured by current methods are the variable interpretations of turbidity of vaccines in terms of bacterial content, and the variable results obtained in the intra-cerebral tests in mice.

Dr. Veldee agreed to place at the disposal of the interested laboratories samples of the National Institutes of Health turbidity standard which is a suspension of particles of Pyrex glass in water, together with samples of the N.I.H. reference vaccine measured against this standard, with a view to obtaining opinions in various countries regarding the suitability of a Pyrex glass suspension for turbidity standard; and to make available the strains of H. Pertussis and of mice used in the N.I.H. Laboratories for the intra-cerebral test.

3. Smallpox Vaccine

The committee considered the investigations necessary for the definition of minimum requirements for smallpox vaccines. To this end it recommended that the seed vaccinia virus used in different countries for the preparation of smallpox vaccines be tested in rabbits for its immunizing potency against freshly isolated human variola virus.

The committee considered that India was a suitable country for such investigations and at the suggestion of Sir Sahib Singh Sokhey, it recommended that WHO should ask the Government of India to arrange for the testing of seed virus in this manner through the mediation of

the World Health Organization.

4. Diphtheria and Tetanus Toxoids (Docs. WHO/BS/43 and WHO/BS/68)

The committee decided that the purified diphtheria and tetanus toxoids intended to serve as international standard preparations should be compared with the plain toxoids currently prepared in different countries for the immunization of man, with a view to ascertaining the amount of the proposed standard preparations to which convenient unit immunizing potency might be assigned.

5. Streptococcus Antitoxin (Doc. WHO/BS/60)

A suitable preparation of streptococcus antitoxin has been procured by the Department of Biological Standards, N.I.M.R., London. Preliminary tests indicate that the preparation is suitable for an international standard. Estimation of the potency of this preparation in terms of the US National Institutes of Health standard streptococcus antitoxin is to be made by laboratories in four countries.

6. Tetanus Antitoxin

The committee noted that informal opinion in various countries was in favour of unifying the dual notation of potency - the international and American units - in current use. Having regard to the circumstances of the original definition of the first international unit for tetanus antitoxin, it recommended that the weight of the international standard preparation to which international unit potency is at present assigned, should be doubled, so that in future the international unit for tetanus antitoxin will be equal to the American (US National Institutes of Health) unit. The committee recommends that this change be announced as soon as possible; and that this notation should be universally adopted for new issues not later than 1 July, 1950.

7. The Detection of Tubercle Bacilli (Doc. WHO/BS/57)

The committee considered that the problem of devising standard techniques for the detection of tubercle bacilli in pathological material should be studied in close collaboration with the Expert Committee on Tuberculosis, preferably by a joint sub-committee.

8. Serodiagnosis of Enteric Infections (Doc. WHO/BS/53)

The committee accepted the proposal of Dr. A. Felix to prepare eight horse antisera for the specification of agglutinating suspensions for use in the serodiagnosis of enteric infections. Antisera specific for the following antigens will be made: Salmonella typhi (H);

Salmonella typhi (O); Salmonella typhi (Vi); Salmonella paratyphi A (H); Salmonella paratyphi A (O); Salmonella paratyphi B (H); Salmonella paratyphi B (O); Salmonella paratyphi, non-specific (H).

The committee recommended that the antisera should be examined in laboratories in six countries for their suitability as standard preparations; and that, if suitable, they should be adopted as international standard preparations. It decided to defer the definition of agglutinating potency until its next meeting.

9. Serodiagnosis of Rickettsial Infections (Doc. WHO/BS/63)

The committee accepted the proposal of Dr. A. Felix to prepare horse antisera for the specification of the X strains of Proteus vulgaris FOR Specifying agglutinating suspensions to be used in the serodiagnosis of rickettsial infections. Antisera for the following antigens will be made: P. vulgaris, OX19; P. vulgaris OXK; P. vulgaris OX2. The committee recommended that the antisera should be examined in laboratories in six countries for their suitability as international standard preparations.

The committee recommended that interested workers be asked for their opinion about the desirability of standard antisera for specifying rickettsial suspensions.

10. Serodiagnosis of Syphilis

The committee noted that the question of the serodiagnosis of syphilis was being considered by a special Sub-Committee of the Expert Committee on Venereal Infections, and expressed a wish that a member of the Expert Committee on Biological Standardization should be invited to attend the meetings of the sub-committee and the planned serological conference.

11. PPD (Doc. WHO/BS/59 and Doc. WHO/BS/64)

Further tests of various preparations of PPD have shown that their sensitizing properties do not debar them from use as standard preparations. The reaction they produce in hypersensitive animals and man, however, are qualitatively different in a significant degree. Moreover, PPD and similar materials prepared in different ways contain variable proportions of active fractions of different molecular weight. The committee therefore decided to defer the establishment of reference preparation until its next session, and meanwhile recommended and arranged for a comparative biological and physicochemical examination

in five laboratories of representative types of purified tuberculo-
proteins.

12. BCG (Doc. WHO/BS/45)

The committee approved the reports submitted at the request of UNICEF by Drs. Timmerman and Gautier (Documents JC2.UNICEF-WHO/1 and JC3.UNICEF-WHO/2), Dr. Timmerman (Document JC3.UNICEF-WHO/32) and Dr. Sokhey (Document JC3.UNICEF-WHO/1) on the preparation of BCG at the State Serum Institute, Copenhagen, the Pasteur Institute, Paris, the Institut Pasteur d'Algérie and the King Institute, Madras.

The committee discussed the conditions necessary for the production of safe and effective BCG vaccine, and defined them in Annex attached. It recommended that laboratories manufacturing BCG on behalf of UNICEF should conform to the specifications contained in this document.

The committee noted that the Institut Pasteur, Paris, was now ready to serve as the world centre for the preparation and distribution of freeze-dried cultures of living BCG for use as seed culture for the preparation of BCG vaccine. The distribution will be made monthly, directly to the laboratories producing BCG for the UNICEF vaccination campaign, and to other interested laboratories on recommendation of the National Control Centres.

13. Digitalis (Doc. WHO/BS/51)

Fifteen of the seventeen participants in the comparison of the proposed third international standard for digitalis with the second international standard have submitted their results. The proposed standard preparation is of suitable quality and its potency is almost identical with that of the second international standard. The exact designation of potency must await the completion of the assays. The committee recommends that the Department of Biological Standards, N.I.M.R., London, be authorized, after due consultation with participating laboratories, to assign to this standard the potency indicated by the combined results of the seventeen assays.

14. Sulpharsphenamin

A suitable batch of sulpharsphenamin has been procured by the Department of Biological Standards, N.I.M.R., London. Preliminary comparisons with the second international standard sulpharsphenamin indicate that the new preparation is suitable for the third international standard. A final comparison of the two preparations is to be made by laboratories in five countries.

15. Anti-pernicious-Anaemia Factor (Docs. WHO/BS/61 and WHO/BS/58)

A standard preparation for the measurement of the anti-pernicious-anaemia potency of extracts of liver and other animal tissues is urgently required. The recent isolation of the Vitamin B₁₂ provides a substance which may prove to be suitable for such a preparation. The scarcity and high potency of these materials entails dispensing the standard preparation in exceedingly small quantities. Tests of the stability of dry Vitamin B₁₂ in these conditions are in progress.

In the meantime, the committee recommends that the Department of Biological Standards, N.I.M.R., London, be authorized to procure pure Vitamin B₁₂ in a sufficient quantity to serve as a standard preparation for anti-pernicious-anaemia factors, and to ascertain the opinion of interested workers about the preferred size of a unit of activity.

16. Hormones

16.1 Oestrone and Oestradiol Monobenzoate (Doc. WHO/BS/50)

The committee recognizes that preparations of oestradiol monobenzoate and of oestrone are no longer necessary as biological standards, and recommends that their issue as international biological standards should cease on 1 January 1951. In the meantime users of the standards should be warned of this decision.

16.2 Thyrotrophin and Corticotrophin

The committee considered the need for continuing with the preparation of a standard for thyrotrophin recommended by the Third Conference on the Standardization of Hormones (1938) and interrupted by the war; and for a standard for corticotrophin. The committee recommended that opinion of interested workers should be sought on these matters.

16.3 Androsterone (Doc. WHO/BS/50)

The committee recognised that the international standard preparation of androsterone is mainly used as a pure chemical standard and, as such, is obsolete as a biological standard. However, since the standard is still to some extent used in biological assay, the committee recommends that the international standard androsterone, the stock of which is nearing exhaustion, should be replenished; but that users should be warned that the distribution of this standard when stocks again become low, will be restricted to those using it for biological assay.

The committee authorized the Department of Biological Standards, N.I.M.R., London, to proceed with the replenishment of the standard preparation.

16.4 Secretin

The committee considered the proposal for the establishment of an international standard for secretin, and recommended that more information about the demand for this standard be obtained.

17. Fat-soluble Vitamins (Doc. WHO/BS/65)

The committee adopted parts I, II and III of the Report of the Sub-Committee on Fat-soluble Vitamins and noted the proposal in part IV concerning the estimation of Vitamin content in foodstuffs.

The committee recommends that the international standard for Vitamin D shall be the preparation of crystalline Vitamin D₃ having the characteristics and unit potency described in Part I of the Report, and that the existing standard preparation of irradiated ergosterol ceases to be the international standard for Vitamin D but is maintained as a references preparation.

The committee recommends that the international standard for Vitamin A shall be crystalline all trans Vitamin A acetate, having the characteristics and potency described in Part II of the Report; and that the existing standard preparation of pure all trans B-carotene ceases to be the international standard for Vitamin A_c, and becomes the international standard for Provitamin A, having the unit potency indicated in the Report.

18. Antibiotics

18.1 Penicillin (Doc. WHO/BS/67)

The stocks of the international standard for penicillin are running low. The committee therefore decided to procure a preparation of pure penicillin G (II) to serve as the second international standard for penicillin. The Department of Biological Standards, N.I.M.R., London, was authorized to institute an assay of the proposed second international standard for penicillin in terms of the existing standard. The committee suggested that laboratories in six countries should participate in this work.

As regards the recommendation made at the first session of the Expert Committee on Biological Standardization of the Interim Commission

of WHO (1947)*, that the reference preparation of penicillin K (IV) should be set up, the committee noted that there was at present little demand for such a preparation as a standard in the differential biological assay of the penicillins, and recommended that no immediate action be taken.

18.2 Streptomycin (Doc. WHO/BS/67)

The committee decided that the reference preparation of streptomycin held by the Department of Biological Standards, N.I.M.R., London, since April 1948, should now be established as the international standard for streptomycin; and recommended that a preparation of dihydrostreptomycin should be obtained and held as a reference preparation.

The committee recommended that the potency of the international standard should be expressed either as units of activity or as gram-equivalents of streptomycin base or as both.

Unit activity should in the first place be assigned to that weight of the standard preparation which, as far as can be ascertained, contains one microgram of streptomycin base, thereby making the international unit as nearly as possible equivalent to the original Waksman unit.

19. Blood Groups

19.1 ABO (Doc. WHO/BS/49)

Eight of the eleven participants in an examination of the preparation of anti-A and anti-B sera proposed as standards for A and B blood-grouping sera have submitted their results. The proposed standard preparations are of suitable quality and potency. The exact designation of potency must await the completion of the examination.

The committee recommended the establishment of the international anti-A anti-B agglutinating serum standards and that the Department of Biological Standards, N.I.M.R., London, be authorized to assign to these standards potencies indicated by the modal macroscopic agglutination titres obtained in the eleven assays; the unit of agglutinating potency in each case to be reciprocal of the agglutination titre.

19.2 RH (Doc. WHO/BS/46)

The committee did not consider that at present it was expedient to establish international standard preparations of the various anti-Rh sera, or to make any recommendations about the notation of the Rh groups.

The committee decided that a universally acceptable definition of the term "Rh-negative" was desirable, and recommended that the following definitions should be adopted internationally.

The term "Rh-negative" should whenever possible be applied to a human blood donor only if his erythrocytes are not agglutinated by three anti-Rh sera; namely:

- (1) Anti-Rh₀ (Wiener notation); anti-D (Fisher-Race notation)
- (2) Anti-Rh' (" "); anti-C (" " ")
- (3) Anti-Rh" (" "); anti-E (" " ")

Tests for the antigens represented by antisera (1) and (2) are conveniently made by the mixed serum anti-Rh' (Wiener) anti-D + C (Fisher-Race); and for the antigens represented by antisera (1) and (3) by the mixed serum anti-Rh₀" (Wiener) anti-D + E (Fisher-Race).

The antisera (2) and (3) however are not always available. In this case tests with antiserum (1) may be considered sufficient for specifying an Rh negative donor, but it should be realized that the risk of incompatibility is thereby slightly increased. Tests with antiserum (1) anti-Rh₀ (Wiener) anti-D (Fisher-Race) are indispensable.

The term "Rh-negative" should be applied to a human blood recipient when his erythrocytes are not agglutinated by an anti-Rh₀ (Wiener) anti-D (Fisher-Race) serum. An Rh-negative recipient is not necessarily an Rh negative donor.

20. Request of the Expert Committee on the Unification of Pharmacopoeias (Doc. WHO/BS/47)

The committee agreed to collaborate with the Expert Committee on the Unification of Pharmacopoeias in preparing appendices on the determination of therapeutic potency of sulpharsphenamin, neoarsphenamin, digitalis, the vitamins, antitoxins and old tuberculin.

21. The Notation of Measures of Potency (Doc. WHO/BS/55)

The committee considered the circumstances in which the three current methods of designating the potency of biological substances

are valid. These circumstances are:

- (1) Whether or not the active principles in biological substances have been characterized by chemical and physical means, the potency of preparations of such substances should be expressed in units whenever the active principle in both standard preparation and preparations to be assayed may be heterogeneous.
- (2) The expression of potency in gram-equivalents is valid, although not always desirable, when the active principle in the standard preparation is known to be homogeneous and free from inert material, and the active principles in preparations to be assayed may be heterogeneous.
- (3) Designation of potency in grams is justified only when the active principle in the standard preparation is known to be homogeneous and free from inert material and when the active principle in the preparations to be assayed is known to be homogeneous. In such circumstances, however, biological assay will be necessary only when expense prohibits the routine characterization of preparations by physical and chemical means.

REQUIREMENTS FOR LABORATORIES ENGAGED IN THE PREPARATION
OF BCG VACCINE FOR THE UNICEF VACCINATION CAMPAIGN

1. General Observations

In the present state of our knowledge it is unfortunately unavoidable that vaccination with BCG should have to be performed on human subjects before all the necessary precautionary testing of the vaccine has been completed. This position is unsatisfactory and a reliable drying-technique, including a sufficiently accurate estimate of the viable bacilli together with their properties in the dried product is an urgent necessity. Meanwhile, in order to eliminate insofar as possible the dangers resulting from this situation, rigorous precautionary measures must be taken for safeguarding the purity of the vaccine. Contamination with other micro-organisms may take place at any stage in the process of preparation.

In the following, the factors which seem of importance are discussed in detail.

2. The Staff

It must be emphasized that, however ideal may be the conditions and precautionary measures adopted, an incompetent staff will imperil the safety and efficacy of the vaccine. Therefore the staff must be very carefully selected, special attention being paid both to its technical ability and to its sense of responsibility, the latter being as important as the former.

The number of workers on the staff should be sufficient to ensure that in the case of the absence of one of its members, the duties can be carried out by one of the others.

All staff members including the persons who clean the building, should be in good health and not suffering from infectious disease or carrying virulent micro-organisms. They should be medically examined by competent specialists before entering the BCG service; great attention being paid to the absence of tubercular infection in any form. These medical examinations should be repeated every three months.

Staff members should be immediately excused from duty when falling

ill and should not re-enter the BCG laboratories until a careful medical inspection has proved the absence of infectious disease.

It is highly desirable that all members of the staff work only on BCG. However, under special circumstances it may be unavoidable that other part time activities are performed. Permission to undertake other work should receive consideration only when it is certain that it in no way entails the danger of infection with viruses or virulent micro-organisms, especially spore-bearing and tubercle bacilli.

Visitors should not be permitted to enter any of the laboratories concerned in the production of BCG, unless proved free from tubercular infection.

3. The Building

The preparation of BCG vaccine shall be carried out in special rooms forming a topographically separate unit and self-contained.

An ideal BCG vaccine producing laboratory should be housed in a separate building, used exclusively for BCG work. However, a unit on a separate floor of a larger building or at the blind end of a corridor of such a building might be acceptable, provided the location is such as to render negligible any risk of contamination with virulent tubercle bacilli or other agents. Each situation as it occurs should be studied according to its merits. Glassware, utensils and other instruments should never leave the BCG unit. The preparation of all media and other materials, and all sterilizations should take place in the BCG unit.

The unit should consist of at least:

- (1) A laboratory for the maintenance of the BCG strains and for the inoculation of media to be used for the vaccine.
- (2) A laboratory for the preparation of the vaccine.
- (3) A laboratory for ampouling the vaccine.
- (4) A laboratory for the preparation of the media and for sterilization.
- (5) An office for administrative purposes.
- (6) Adequate changing rooms, lavatories and water closets.

4. Animal Quarters

No animals shall be permitted in the unit; the animal inoculation and post-mortem examinations necessary for the testing of the parent strain of BCG and the batches of vaccine shall be carried out in animal quarters topographically and functionally separate from the unit in which vaccine is prepared.

5. Special precautions against contamination

Full precautions shall be taken to prevent the introduction of bacterial contamination through the agency of air, water, equipment, material or personnel. All workers in the unit should wear laboratory gowns and laboratory footwear.

Workers immediately engaged in direct preparations of the vaccine should wear clean cap, mask, gown and foot-wear which are specially kept for the purpose in a room guarding the entrance to the rooms where the vaccine is handled. The cleaning and maintenance of these rooms should be under the direct supervision of a qualified technician. All rooms in the unit shall be kept locked when not in use.

- (1) incubators should be kept locked
- (2) The keys of both rooms and incubators to be kept in the custody of responsible workers.

6. Methods of cultivating the BCG Strains and of Vaccine Production

The methods of cultivating the BCG strains and of preparing the vaccine should be such that at no stage could contamination with other micro-organisms or viruses occur. The adequate fulfilment of this requirement depends on the staff, the location of the building, the laboratories, the animal house, the equipment, etc., all of which have already been discussed. A rigid prescription of techniques to be used is not recommendable, owing to the variety of methods possible. The following data shall be recorded in a permanent form under the supervision of the director:

- Origin and date of reception of the seed strain; the date of all subcultures of the strain and the method of subcultivation employed.
- The morphological character of the culture at all relevant stages during manufacture of the vaccine
- The method of preparation of each batch of the vaccine
- The tests for sterility, innocuity, infective and skin-sensitizing potency.

The vaccine should be stored at a suitable temperature.

7. The Control Tests

The following tests should be applied:

- (1) A sterility test. Suitable aerobic and anaerobic methods should be used.
- (2) An innocuity test. At least 5 mg of BCG bacilli of the prepared vaccine are injected subcutaneously or intraperitoneally into one or more guinea pigs. The animals are sacrificed and examined after 6 months' observation. An innocuity test should also be carried out with a subculture to serve as a step in the preparation of a particular batch of vaccine, at least three weeks before the batch is ready for use. One or more guinea pigs should be injected intraperitoneally with 10 mg of bacilli from this subculture and should be sacrificed and examined before the vaccine, prepared from this subculture, is approved.
- (3) A test for skin-sensitizing potency. Five mg of BCG bacilli of the prepared vaccine are injected subcutaneously or intraperitoneally into one or more guinea pigs. After 4 weeks the intracutaneous injection in 0.1 cc containing 100 I.U. O.T. should produce an area of induration and oedema not less than 5 mm in diameter.
- (4) A potency test. Graded doses of the finished vaccine should be injected intradermally into one or more albino guinea pigs. One of these doses should be equal to the human dose. The potency of the vaccine should also be compared with the results obtained in children. All control tests and their results should be carefully recorded.

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DE LA SANTÉSECOND WORLD HEALTH ASSEMBLYA2/24 Add.1 ✓
13 juin 1949

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✓ EXPERT COMMITTEE ON BIOLOGICAL STANDARDIZATION
Report of the Third Session

(Provisional Agenda Item 8.16.1)

The ad hoc Committee of the Executive Board, having noted the report of the Expert Committee on Biological Standardization as instructed by the third session of the Executive Board ¹ :

Endorsed the Committee's expression of regret on the loss of Mr. P. Bruce White, outstanding bacteriologist and serologist who had been closely connected with the work of the Committee.

¹ Off. Rec. World Hlth Org. 17, 13

DEUXIEME ASSEMBLEE MONDIALE
DE LA SANTEA2/24 Add.1
13 juin 1949

ORIGINAL : ANGLAIS

COMITE D'EXPERTS POUR LA STANDARDISATION BIOLOGIQUE
Rapport sur la Troisième Session

(Point 8.16.1 de l'Ordre du jour provisoire)

Le Comité ad hoc du Conseil Exécutif,

Ayant pris acte du rapport du Comité d'experts pour la Standardisation biologique, conformément aux instructions données par le Conseil Exécutif lors de sa troisième session, ¹

S'associe aux regrets exprimés par le Comité au sujet du décès de Mr. P. Bruce White, bactériologiste et sérologue éminent, qui avait collaboré étroitement aux travaux du Comité.

¹ Actes off. Org. mond. Santé, 17, 13