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ANALYTICAL REVIEW

OF

REPORTS FROM PASTEUR INSTITUTES

ON THE

RESULTS

OF

ANTI-RABIES TREATMENT

BY

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ANALYTICAL REVIEW

1. INTRODUCTION

In accordance with the resolution adopted by the International Rabies Conference, which was convened by the Health Organisation of the League of Nations at Paris in April 1927, the anti-rabies institutes of all countries were asked to submit the results of anti-rabies treatment in their respective institutes on a uniform plan. A schedule, drawn up in conformity with the recommendations adopted at the Conference, was sent to each institute. In response to that demand, replies have been received from thirty-one institutes. Though this is but a small proportion of all the institutes of the world, it must be remembered that, in certain cases, the establishment of statistical data in accordance with this scheme necessitated changes in procedure which could not be adopted immediately. We take this opportunity of expressing our acknowledgment to those institutes which have so kindly complied with our request. It is hoped that, in future years, this report will contain information regarding a much larger number of institutions. The larger figures so obtained will enable us to draw more definite conclusions than the size of the available figures would warrant.

A list of the institutes of the world is attached. Those marked with an asterisk are the institutes from which returns have been received. The statistical data dealt with in the present report relates to thirty-one institutes, and to 31,656 persons treated.

2. LIST OF PASTEUR INSTITUTES

EUROPE.

Austria: Vienna*, annex I.

Belgium: Brussels.

Bulgaria: Sofia.

Czechoslovakia: Prague.

Finland: Helsingfors (Helsinki)*, annex II.

France: Bordeaux.

Lille.

Lyons.

Marseilles.

Montpellier.

Paris, (25, rue Dutot)*, annex III.

Germany: Berlin*, annex IV.

Breslau*, annex V.

Dresden*, annex VI.

Freiburg i. Brisingau.

Munich-Schwabing*, annex VII.

Nuremberg*, annex VIII.

Regensburg*, annex IX.

Straubing ("Krankenhaus der Barmherzigen Brüder")*
annex X.

Straubing ("Weibl. Krankenhaus der Elisabetherinnen")*, annex XI.

Würzburg*, annex XII.

Greece: Athens.

Hungary: Budapest*, annex XIII.

Italy: Bologna.

Faenza.

Florence.

Messina.

Milan.

Naples.

Padova.

Palermo.

Pisa.

Rome.

Sassari.

Turin.

Latvia: Riga*, annex XIV.

Netherlands: Utrecht*, annex XV.

Poland : Cracow.
Lemberg (Lwow)*, annex XVI.
Warsaw*, annex XVII.
Vilna*, annex XVIII.

Portugal : Lisbon.

Roumania : Bucharest.
Jassy.

Spain : Barcelona.
Madrid.

Switzerland : Berne.

Turkey : Constantinople.

*Union of Soviet Socialist Republics*¹, annex XXXII :
Kherson.
Kharkov.
Leningrad.
Moscow.
Odessa.
Perm.
Samara.
Tiflis.

Yugoslavia : Belgrade*, annex XIX.
Nish*, annex XX.
Novi-Sad.
Sarajevo*, annex XXI.
Zagreb*, annex XXII.

ASIA.

Palestine : Jerusalem*, annex XXIII.

British India : Bombay*, annex XXIV.
Calcutta*, annex XXV.
Kasauli (Punjab)².
Rangoon.
Shillong*, annex XXVI.

Ceylon : Colombo*, annex XXVII.

Federated Malay States : Kuala Lumpur*, annex XXVIII.

Java (Netherlands East Indies) : Bandoeng.

¹ A special report on the work during 1927 of all Institutes (108) and anti-rabies stations (285) has been received from the Commissariat of the People's Health, but arrived after the analysis of information received from other Institutes had been made and therefore could not be included; it is, however, given as Annex XXXII.

² *Editor's Note.* — The important clinical material of the Pasteur Institute of India at Kasauli will form the subject of a special publication.

Siam : Bangkok*, annex XXIX.

French Indo-China : Hanōi.
Saïgon.

China : Shanghai*, annex XXX.

Chosen : Beul.

Japan : Kobe.
Tokio.
Taihoku.

AFRICA.

Senegal : Dakar.

Morocco : Rabat.
Tangier*, annex XXXI.

Algeria : Algiers.

Tunis : Tunis.

Madagascar : Antananarivo.

Egypt : Cairo.

AMERICA (Latin America).

Mexico : Mexico City.

Peru : Lima.

Chile : Santiago.

Brazil : Bahia.
Bello Horizonte.
Juiz de Fera.
Porto Alegre.
Recife.
Rio de Janeiro.
São Paulo.

Argentine : Buenos Aires.

The reviewer would draw attention to two points with regard to which the information asked for is, in many cases, incomplete :

(1) The method of treatment employed has, in certain instances, not been described with sufficient precision¹. When standard methods are employed, this presents no difficulty but,

¹ *Editor's Note.* — The reader will find the description of techniques for the preparation of anti-rabic vaccine in the League of Nations publications prepared for the International Rabies Conference (documents C. H. 487 (a), (b), (c), (d), etc., and C. H. 531 (1)).

when modifications in these methods have been introduced, the procedure of preparation of the vaccine, and full information as to the effects of such modifications, should be given in detail.

(2) Answers to the question regarding the " following-up " of treated cases are, in the main, indefinite. A full answer should state the proportion of cases regarding which complete returns have been received and after what period of time the information has been collected:

The returns, as received from the various institutes, are printed verbatim in the annexes, and in Table I¹ the main facts extracted from these returns are summarised.

In the analysis which follows, the numerical material has been examined by accepted statistical methods with the object of extracting evidence as to the relative efficacies of the various methods of treatment employed. Questions of economy, or of the applicability of the various methods of treatment in particular circumstances and under particular conditions are not discussed. It should be emphasised at the outset (1) that, as the number of institutes from which returns have been received fall far short of the total, any conclusions which may emerge can only be of a tentative nature, and (2) that these conclusions are based solely upon the numerical data submitted, and are made on the assumption that the figures are accurate.

In future years, when returns from all institutes are available, and when the resolution of the Conference regarding the following-up of treated cases has been more strictly complied with, more definite conclusions may be expected.

¹ Cf. p. 38.

3. METHODS OF TREATMENT EMPLOYED.

In the second column of Table I the method of treatment employed at each institute is given.

(a) The dried-cord method is employed at Warsaw for in-patients, the cords used having been dried for from one to four days.

(b) Glycerinated cords are employed at Bangkok, Paris, Vilna, and Tangier.

(c) At Riga and at Helsingfors, for the treatment of in-patients, cords are dried for 24 hours, and subsequently preserved in 50 per cent glycerine. For the treatment of out-patients at Riga, 0.5 per cent phenol is added.

(d) At Budapest the treatment is a modification of the method of Högyes. The cord is placed in 50 per cent of glycerine, phenolised to 0.5 per cent. At the end of 24 hours, an emulsion is prepared. The emulsion is administered to the patient after having been kept for from nine to thirteen days in the ice-chest.

(e) The method of Högyes-Phillips is employed at the Robert Koch Institute at Berlin, at Dresden, at Munich-Schwabing, and at the "Krankenhaus der barmherzigen Brüder" and at the "Weibliches Krankenhaus der Elizabetherrinnen" in Straubing, at Regensburg, at Nuremberg, and at Würzburg.

(f) Carbolised vaccine, prepared according to the method of Semple, is employed at Calcutta, Warsaw (for out-patients), Shillong, Colombo, Jerusalem, Bombay, Shanghai, Kuala Lumpur, Breslau. Vaccine obtained from the Mulford Laboratories is used at Lwow.

(g) Ether methods are used at Nish, Sarajevo, Zagreb and Belgrade.

Of these :

(1) The Högyes-Alivisatos method is employed at Nish ;

(2) The "Eterna" method is used at Sarajevo (brain and cord kept in ether for 96 hours, and then preserved up to twelve days in glycerine);

(3) The Alivisatos method is used at Zagreb (cerebrum and cerebellum placed in ether for 72 hours; for the emulsion, the grey matter of the cerebrum, cerebellum and hippocampus major are alone utilised);

(4) At Belgrade the Hempt rapid method is used. After five days etherisation, the brain substance is kept in phenol-glycerine for ten days.

(h) At Vienna, slightly-bitten persons are treated by Högyes methods using dilutions of 1/500 and 1/100. Severely-bitten persons receive similar treatment, coupled, during the first six days, with Alivisatos ether vaccine (etherised 72 hours).

In dealing with the statistics which have been examined, the method of treatment employed will be grouped, either :

(a) As shown in Table I¹ under the following categories :

1. Dried cords, with or without preservation in glycerine.

2. Dilution methods. This group includes eight German institutes which employ the methods of Högyes-Phillips, the institutes of Riga and Helsingfors in which dilutions are made from cords which have been dried for 24 hours, and the Institute of Budapest, where the method of Högyes, modified in that, before dilution, the cord is preserved for 24 hours in phenol-glycerine. In defining the group I have assumed that the vaccine has presumably not been killed by the addition of phenol, and that drying for 24 hours is insufficient to justify inclusion amongst dried-cord methods.

3. Vaccines killed by phenol, according to the methods either of Semple or of Mulford.

4. Ether vaccines without the addition of phenol.

5. Ether vaccine subsequently killed by phenol.

6. At Vienna two methods of treatment are employed. This forms a mixed group.

or (b) according to :

1. Treatment with vaccines containing a live virus (including 1, 2 and 4 above).

2. Treatment by vaccines containing killed virus, (including 3 and 5 above).

¹ See page 35.

4. NUMBER OF PATIENTS TREATED.

The total number of treated persons referred to in the returns which are under review was 31,656. These may be subdivided as follows :

	Patients	Average per institute
1. Dried cords	2,318	464
2. Dilutions	6,312	485
3. Killed phenol vaccines	17,538	1,754
4. Ether vaccines (not killed)	3,634	908
5. Ether vaccines (killed)	1,356	1,356
6. Mixed	448	448
Total	31,656	911

Or, again, the number of institutes at which varying annual numbers of patients were treated by the different methods may be tabulated :

	Annual number of patients		
	0-500	500-1,000	over 1,000
1. Dried cords	3	2	0
2. Dilutions	8	0	1
3. Killed phenol vaccines	4	1	5
4. Ether vaccines (not killed)	0	3	1
5. Ether vaccines (killed)	0	0	1
6. Mixed	1	0	0

It is apparent that the dried-cord method is only used where the number of patients is small, whilst, when numbers are large, phenol, ether and dilution methods are employed.

5. MORTALITIES FOR ALL PATIENTS

Of the total of 31,656 persons treated at the various institutes, 156 died of rabies — a mortality of 0.49 per cent. The detailed mortalities amongst persons treated by the different methods are as follows :

	Number treated	Deaths	Mortality per cent
1. Dried cords	2,318	17	0.73
2. Dilutions	6,362	8	0.126
3. Killed phenol vaccines .	17,538	119	0.68
4. Ether vaccines (not killed)	3,634	9	0.25
5. Ether vaccines (killed) .	1,356	3	0.22
6. Mixed	448	0	0
Total	31,656	156	0.49

Or, again, according to the second mode of subdivision :

	Number treated	Deaths	Mortality per cent
1. Living vaccines	12,762	34	0.27
2. Killed vaccines	18,894	122	0.65

The method of testing the significance of such variations as do occur is fully described by R. A. Fisher ("Statistical Methods for Research Workers", OLIVER & BOYD, Edinburgh, 1928), and discussed by G. Udney YULE (*Journal of the Royal Statistical Society*, 1922, Vol. 85, Part I, page 95).

The figures are grouped as follows :

	Died	Survived	Totals
Treatment (1)	<i>a</i>	<i>b</i>	<i>a + b</i>
Treatment (2)	<i>c</i>	<i>d</i>	<i>c + d</i>
Total	<i>a + c</i>	<i>b + d</i>	<i>a + b + c + d</i>

From this a value, χ^2 , is deduced, such that :

$$\chi^2 = \frac{(a + b + c + d) (ad - bc)^2}{(a + b) (c + d) (a + c) (b + d)}$$

From the value of χ^2 so obtained one finds :

$$P = \sqrt{\frac{2}{\pi}} \int_{\chi}^{\infty} e^{-\frac{1}{2}\chi^2} d\chi,$$

which is the probability that an equal or greater difference than that observed would be likely to occur in a population which was admittedly homogeneous. If, for example, $P = 0.01$, a difference as great as, or greater than, the observed is likely to occur

once in every 100 sets of observations. If P lies between 0.1 and 0.9, homogeneity may be presumed. It is usually safe to draw a conventional line at $P=0.05$, and to consider that any lesser value indicates a real discrepancy. A table, giving the value of P for serial values of χ^2 , is given by YULE (*loc. cit.*).

When this method is applied to the second table in this section, we find that $P = 0.0000027$. That is to say, if one assumes that the population of persons treated by live vaccines was under exactly the same conditions as the population of persons treated by killed vaccines, the likelihood of the observed figures occurring is about three in a million.

When, further, we apply this method to the first table of this section, we obtain values of P referring to any pair of the various groups. These values are as follows :

	Dried cords	Dilutions	Phenol	Ether not killed	Ether killed
Dried cords	1	0.0000046	0.76	0.0018	0.041
Dilutions		1	0.0000003	0.157	0.396
Phenol vaccines			1	0.0023	0.051
Ether vaccines (not killed)				1	0.864
Ether vaccines (killed)					1

It is clear that homogeneity may be presumed (1) between dried cords and phenol, but not between dried cords and any of the other groups; (2) between dilutions and ether vaccines, but not between phenol and dried cords; (3) between phenol and dried cords but not between phenol and any of the other groups except, possibly, ether (killed); (4) between ether (not killed) and either dilutions or ether (killed), but not between ether (not killed) and either dried cords or phenol vaccines; and (5) between ether (killed) and either dilutions or ether (not killed), but not between ether (killed) and either dried cords or phenol vaccines. It appears, therefore, that the various methods may be placed in two groups, the first comprising dried cord and phenol vaccines and the second dilutions and ether vaccines. Within each of these groups there is no evidence of heterogeneity, but discrepancies are found to exist when members of one group are compared with members of the other.

The following table offers a possible explanation of this phenomenon. The figures denote the percentages of patients classified according to race type.

	Europeans	Non-Europeans
1. Dried cords	57.6	42.5
2. Dilutions	100	0
3. Phenol vaccines	19.7	80.3
4. Ether vaccines (not killed)	100	0
5. Ether vaccines (killed)	99.7	0.3
Total	52.4	47.6

It is apparent that the first group to which reference has been made comprises mixed populations of European and non-European extraction, whilst the second is concerned almost entirely with Europeans. The correlation between race type and degree of mortality will be further examined in the succeeding paragraph.

6. RACIAL STATISTICS.

Of the total of 31,656 persons treated, 16,588 (52.4 per cent) were Europeans, and 15,068 (47.6 per cent) were of non-European birth. Of the former 29 contracted rabies (0.17 per cent), of the latter 127 succumbed (0.84 per cent).

When the figures are subdivided as before, we have :

	Europeans			Non-Europeans		
	Number of patients	Deaths	Mortality per cent	Number of patients	Deaths	Mortality per cent
1. Dried cords	1,334	7	0.52	984	10	1.02
2. Dilutions	6,362	8	0.126	0	0	
3. Killed phenol vaccines.	3,458	2	0.06	14,080	117	0.83
4. Ether vaccines (not killed)	3,634	9	0.25	0	0	
5. Ether vaccines (killed).	1,352	3	0.22	4	0	
6. Mixed	448	0	0			
Total	16,588	29	0.17	15,868	127	0.84

	Europeans			Non-Europeans		
	Number of patients	Deaths	Mortality per cent	Number of patients	Deaths	Mortality per cent
1. Living vaccines	11,778	24	0.20	984	10	1.02
2. Killed vaccines	4,810	5	0.10	14,084	117	0.83

From the second table of statistics (referring to living and killed vaccines) we find from the European figures $P = 0.16$ and from the non-European figures $P = 0.54$, both of which values are consistent with the assumption of homogeneity, that is to say, no advantage of treatment by living vaccines over treatment by killed vaccines has been detected.

Guided by this general result, and following the line of argument suggested at the end of the foregoing section, the values of P for each pair of methods of treatment may now be calculated from European and non-European statistics separately. The values of P are as follows.

EUROPEAN STATISTICS.

	Dried cords	Dilutions	Phenol	Ether not killed	Ether killed
Dried cords	1	0.0024	0.0009	0.125	0.195
Dilutions		1	0.32	0.157	0.396
Killed phenol vaccines			1	0.043	0.114
Ether vaccines (not killed)				1	0.864
Ether vaccines (killed)					1

NON-EUROPEAN STATISTICS.

Figures are available for the investigation of one pair of methods only — i.e., for dried cords as compared with killed phenol vaccines. For this pair the value of P is found to be 0.54.

The resulting values of P for statistics subdivided according to race are strikingly different from those obtained from the general statistics. The only significant discrepancies in the European group are between dried cords and dilutions, and between dried cords and killed phenol vaccines. A value of questionable significance occurs with killed phenol vaccines and ether vaccines (not killed), whilst in the non-European group of statistics no significant difference between treatment by dried cords and by killed phenol vaccines can be detected. Further light will be shed in a succeeding paragraph upon the discrepancy between dried cords and dilution methods as applied to European patients.

With regard to the pair of methods (dried cords as compared with killed phenol vaccines) it is to be noted that a significant discrepancy has been detected from the European statistics, whilst from the non-European statistics there is no evidence of heterogeneity. The fact that the European statistics show an advantage of killed phenol vaccines might be taken as evidence in favour of this method, but too much emphasis should not be laid on this result, especially as the non-European figures containing very much larger numbers give no evidence favouring one method over another.

It would thus appear (1) that a definite difference exists between the risks to which the two race groups have been subjected, in that the non-European group is at a higher state of risk than the European, and (2) that there is no decisive evidence that any clear advantage exists in favour of any one of the various types of methods of treatment, or of those methods in which living vaccines are employed as compared with those in which killed vaccines are used.

It has been thought advisable, however, to examine this deduction from a different point of view.

It can be shown that, in a number of samples drawn from a homogeneous population, the values of χ , derived from the equation

$$\chi^2 = \frac{(x - x_r)^2}{x_r}$$

where x is the observed value and x_r is the theoretical value, should be distributed in such a manner that the number of values of χ between χ and $\chi + d\chi$ is $e^{-\frac{1}{2}\chi^2} d\chi$. In practice we do not know x_r , but we calculate

$m_r \frac{\sum x_k}{\sum m_k}$, and we use this value as the best substitute for x_r . The substitution of this value will, however, affect the distribution of χ in two ways, since x_r occurs in both the numerator and the denominator of χ^2 . It appears, however, that the effect on χ will be small in comparison with

the probable error of χ , provided that more than a very few observations are included. It is therefore not necessary to correct for these effects and it is sufficient to use the relation $\chi^2 = \frac{(x - m_r p)^2}{m_r p}$, where m_r is the

number of individuals in the particular group, and $p = \frac{\sum x_k}{\sum m_k}$ is the mortality over the whole statistics. We can thus tabulate values of χ^2 obtained from the above expression, and examine their distribution.

We shall, in the first place, deal with the combined statistics, and then with Europeans and non-Europeans separately. In employing this method the expected number of deaths should not be less than unity. When this is so, it is necessary to combine sub-populations into groups. In the calculations which follow, the grouping was carried out from statistics arranged in the order given in Table I.

From the statistics for all races the following table was calculated.

%	Expected	Observed
∞	1.10	7
3.841	1.10	2
2.706	2.20	2
1.642	2.20	3
1.074	4.40	4
0.455	4.40	1
0.148	2.20	1
0.0642	2.20	1
0.00158	1.10	1
0		

The numbers in the column "expected" are the numbers of values of χ^2 corresponding to the range given in the first column as calculated from $e^{-\frac{1}{2}\chi^2} d\chi$, those in the column "observed" are the numbers of values of χ^2 deduced from the above relation.

There is clearly very little agreement between expectation and observation and, if one applies the χ^2 method to the second and third columns to test the "goodness of fit", one finds $\chi^2 = 38.89$, $n' = 9$, $P = 0.000003$, which indicates a very poor agreement.

If one applies this method to the statistics for *Europeans only* (after grouping which, in this case, on account of the smaller values of $m_r p$, is much more intensive) we find :

%	Expected	Observed
∞	2.2	1
1.642	3.3	5
0.455	3.3	3
0.0642	2.2	2
0		

Whence, as before, $\chi^2 = 1.53$, $n' = 4$, $P = 0.7$ — that is to say, there is close agreement.

In order to compare the two tables, it is advisable to apply exactly the same grouping to the table for all races as to the table for Europeans alone. The result is as follows :

χ^2	Expected	Observed
∞	2.2	6
1.642	3.3	0
0.455	3.3	5
0.0642	2.2	0
0		

Whence $\chi^2 = 12.93$, $n' = 4$, $P = 0.0046$.

Similarly for *non-Europeans* only, we have :

χ^2	Expected	Observed
∞	1.6	4
1.642	2.4	2
0.455	2.4	2
0.0642	1.6	0
0		

Whence $\chi^2 = 5.34$, $n' = 4$, $P = 0.17$.

It thus appears that, when we consider Europeans and non-Europeans separately, the distribution of deaths amongst the various sub-populations is such as might readily occur, as the result of random sampling, in two groups which were in themselves completely homogeneous, but that, when we consider the combined statistics, the distribution which is obtained is such that the probability that it would occur as the result of random sampling is quite small — namely, of the order of 1 in 200.

Thus, additional evidence is afforded in favour of our former deduction, viz., that the two groups (European and non-European) are heterogeneous with regard to each other, but are apparently not heterogeneous in themselves. Also, it is to be emphasised that — except in so far as it has been necessary to group the statistics of institutions where the expected number of deaths is less than unity ($m_r p < 1$) — this result shows that the deaths are distributed amongst the different institutes in accordance with expectation.

7. SPECIES OF BITING ANIMAL.

The adjoining table shows the percentages of cases classified according to the species of the biting animal, and according to the type of treatment used.

	Percentages						Rumi- nants	Human	Other
	Dog	Cat	Wolf	Jackal	Solipeds				
1. Dried cords	89.7	7.2	0.6	—	0.04	0.4	1.6	0.5	
2. Dilutions	77.4	9.7	—	—	0.9	8.6	0.1	3.4	
3. Phenol vaccines.	85.0	2.3	0.1	11.3	0.2	0.2	0	1.3	
4. Ether vaccines (not killed)	87.3	6.4	0.9	—	0.1	2.6	0.5	2.2	
5. Ether vaccines (killed)	89.5	5.8	0.3	—	0.1	1.8	0.6	1.9	
	<u>83.8</u>	<u>4.8</u>	<u>0.2</u>	<u>6.2</u>	<u>0.3</u>	<u>2.6</u>	<u>0.2</u>	<u>1.8</u>	

The mortalities amongst persons bitten by the various groups of animals are as follows.

(a) Dog.

	Number bitten	Deaths	Mortality per cent
1. Dried cords	2,079	13	0.63
2. Dilutions	4,921	8	0.16
3. Phenol vaccines	14,843	83	0.56
4. Ether vaccines (not killed)	3,171	5	0.16
5. Ether vaccines (killed)	1,213	3	0.25
6. Mixed	300	0	0.0
Total	<u>26,527</u>	<u>112</u>	<u>0.42</u>

(b) CAT.

	Number bitten
1. Dried cords	167
2. Dilutions	616
3. Phenol vaccines	401
4. Ether vaccines (not killed)	231
5. Ether vaccines (killed)	79
6. Mixed	38
Total	<u>1,532</u>

No deaths have been recorded.

(c) WOLF.

	Number bitten	Deaths	Mortality per cent
1. Dried cords	14	4	28.57
2. Dilutions	0		
3. Phenol vaccines	19	5	26.32
4. Ether vaccines (not killed)	34	4	11.76
5. Ether vaccines (killed)	4	0	0
6. Mixed	0		
Total	71	13	18.31

(d) JACKALS AND HYENAS.

Persons bitten by these animals were treated only by killed phenol vaccines. The number bitten was 1,965, the number of fatal cases was 31, i.e., a percentage mortality of 1.58.

(e) SOLIPEDS, RUMINANTS, HUMAN AND OTHER ANIMALS.

The mortalities of persons bitten by these groups of animals are all zero. The numbers of persons treated are as follows :

	Solipeds	Rumi- nants	Human beings	Other animals
1. Dried cords	1	9	36	13
2. Dilutions	56	550	6	213
3. Phenol vaccines	37	44	1	227
4. Ether vaccines (not killed)	3	95	19	81
5. Ether vaccines (killed)	1	25	8	26
6. Mixed	7	96	2	5
Total	105	819	72	564

The subdivision into "human beings" and "other animals" is not exact, in the returns from certain institutes the former group has been included in the latter.

The percentage mortalities in the case of persons bitten by dogs are very similar to those relating to persons bitten by all animals, and tabulated at the commencement of Section 3. The same agreement as to the effect of race type as was developed in Section 6 obviously applies to these figures also. On the other hand, in the case of an animal which bites very severely, and which, when it bites, has a high probability of being rabid, so that the total mortality of those bitten by such an animal is very high, it is to be expected that variations according to race type will not be so marked, for it is clear that, in the extreme case of a type of animal which was always rabid, and whose bites were so deep as to pierce through all protection, the degree of risk run by all bitten persons whatever their race, would be the same. As

compared with the dog, the wolf is an animal whose bites are much more severe, and which does not usually attack human beings unless it be rabid (we are not concerned in these statistics with persons attacked by packs of hungry wolves). It is therefore to be expected that, in the case of persons bitten by wolves, the mortalities amongst Europeans will approximate more closely to the mortalities amongst non-Europeans, than was the case in the statistics dealt with in the previous section. Reference to the figures for wolf bites shows that this expectation appears to be justified, for all of the five fatal cases of persons treated by killed phenol vaccines were Asiatics, whereas the four fatal cases treated by dried cords, and the four treated by ether (not killed) vaccines were Europeans. In fact, the P values calculated from this table are as follows :

	Dried cords	Killed phenol vaccines	Ether vaccines (not killed)
Dried cords	1	0.89	0.157
Phenol vaccines (killed)		1	0.179
Ether vaccines (not killed) . . .			1

It must, however, be pointed out that the figures which are available are very small, and that, when larger numbers are collected, a real difference of considerable magnitude might eventually appear. In the meantime it may be stated that the disappearance of the marked distinction between European and non-European mortalities, in the case of those bitten by wolves, is in agreement with the considerations outlined above. If this tendency towards equality in the mortalities of the two race groups in the case of wolf bites is confirmed by larger figures as they accumulate, it will serve as evidence that the difference in the mortalities of the two race groups, which we have observed in the general case, are due to variations in severity of biting and, in all probability, of rabidness and not to any specific racial immunity or susceptibility.

8. EVIDENCE OF RABIES IN THE BITING ANIMAL.

The proportion of cases in the various categories is as follows

	A	B	C	D
1. Dried cords	9.3	12.2	74.3	4.8
2. Dilutions	13.3	18.1	68.2	0.4
3. Phenol vaccines	6.8	4.5	83.6	5.1
4. Ether vaccines (not killed)	25.2	29.3	36.6	8.9
5. Ether vaccines (killed) . .	9.9	4.2	35.8	50.1
Total	11.1	10.6	71.9	6.4

The high figure, 50 per cent, in Category D for ether (killed) vaccine (Belgrade) is to be noted. When it is remembered that Category D comprises cases in which the biting animal has been proved to be free from rabies, it is clear that the mortality of 0.22 previously given is far too low.

The mortalities in the several categories are as follows :

CATEGORY A.

	Number treated	Deaths	Mortality per cent
1. Dried cords	216	1	0.46
2. Dilutions	845	2	0.21
3. Phenol vaccines	1,200	6	0.50
4. Ether vaccines (not killed)	914	0	0
5. Ether vaccines (killed) . .	134	1	0.74
Total	3,495	10	0.29

CATEGORY B.

1. Dried cords	282	0	0
2. Dilutions	1,145	2	0.17
3. Phenol vaccines	785	0	0
4. Ether vaccines (not killed)	1,064	4	0.38
5. Ether vaccines (killed) . .	57	0	0
Total	3,363	6	0.18

CATEGORY C.

1. Dried cords	1,721	14	0.81
2. Dilutions	4,320	3	0.07
3. Phenol vaccines	14,662	113	0.77
4. Ether vaccines (not killed)	1,331	5	0.38
5. Ether vaccines (killed) . .	486	2	0.41
Total	22,752	137	0.60

CATEGORY D.

	Number treated	Deaths	Mortality per cent
1. Dried cords	99	2	2.02
2. Dilutions	26	0	0
3. Phenol vaccines	891	0	0
4. Ether vaccines (not killed)	325	0	0
5. Ether vaccines (killed) . .	679	0	0
Total	<u>2,020</u>	<u>2</u>	<u>0.10</u>

The high mortality of 2.02 in Category D is to be noted. These cases occurred in Warsaw where the treatment was with cords dried for from four days to one day. The incubation periods of these cases were 30 and 76 days.

A comparison of the mortalities amongst persons treated by live and killed vaccines respectively may, in the first place, be made.

In *Categories A and B*, the figures are as follows :

	Number treated	Deaths	Mortality per cent
1. Living vaccines	4,672	9	0.19
2. Killed vaccines	2,176	7	0.32

Whence $\chi^2 = 1.06$, and $P = 0.30$; that is to say, there is no evidence of heterogeneity.

In *Category C* we have :

	Number treated	Deaths	Mortality per cent
1. Living vaccines	7,604	22	0.29
2. Killed vaccines	15,148	115	0.76

Whence $\chi^2 = 18.7$, and $P = 0.000013$; a very significant value.

These results show (1) that, when the two methods are compared with respect to persons bitten by animals proved or certified to be rabid, no significant difference can be detected, but (2) that, when they are compared with respect to animals suspected but not proved to be rabid, there is evidence of a very definite heterogeneity.

A closer examination yields further information. The P values for various pairs of methods of treatment from the statistics referring to *Categories A and B*, are as follows.

	Dried cords	Dilu- tions	Phenol (killed)
Dried cords	1	1	0.9
Dilutions		1	0.53
Killed phenol vaccines			1

that is to say, no evidence of heterogeneity has been detected. The figures dealt with are small, and it must always be remembered that proportionately greater aberrations are likely to occur in small groups as compared with large groups as the result of random sampling, and that, consequently, the mere subdivision of a group will tend to enhance the P values. Nevertheless, when the figures relating to Category C are similarly subdivided, two very low values of P are observed.

Thus : P values for Category C.

	Dried cords	Dilutions	Phenol (killed)
Dried cords	1	0.000001	0.84
Dilutions		1	0.0000003
Killed phenol vaccines			1

Thus there is no evidence of heterogeneity between dried cord and killed phenol methods, but there is very strong evidence of heterogeneity when the dilution method is compared with the other two.

Combining these results we conclude (1) that there is no evidence of heterogeneity between dried cord and killed phenol methods in either Category A and B, or in Category C, and (2) that, when dilution methods are compared with either of the other two methods, there is no evidence of heterogeneity in cases where rabidness of the biting animal is proved or certified, but that there is very definite evidence of heterogeneity in cases where the biting animal is suspected but not proved to be rabid.

The figures upon which these deductions are based are however small, and in view of the importance of the question at issue it is highly desirable that larger figures relating to this point should be available. It will be of the greatest interest, when these accumulate, to ascertain whether an advantage in favour of the dilution method does or does not appear in Categories A and B as well as in Category C.

9. SEVERITY OF BITING.

The proportions of cases in the several groups are as follows.

	Deep	Superficial	No visible lesion
1. Dried cords	33.0	59.5	7.5
2. Dilutions	17.8	62.8	19.6
3. Phenol vaccines	49.4	42.7	7.9
4. Ether vaccines (not killed)	22.6	68.2	9.2
5. Ether vaccines (killed) . .	2.6	85.3	12.1
Total	36.3	52.4	11.2

Attention may be drawn to the large number of deep bites amongst those treated by phenol vaccine, and to the high percentage of cases in which there was no visible lesion amongst those treated by dilution methods. The mortalities amongst the various groups are as follows :

(a) *Deep.*

	Number treated	Deaths	Mortality per cent
1. Dried cords	766	15	1.96
2. Dilutions	1,130	6	0.53
3. Phenol vaccines	8,613	105	1.22
4. Ether vaccines (not killed)	820	6	0.73
5. Ether vaccines (killed) . .	36	3	8.33
Total	11,468	135	1.18

The high mortality amongst those treated by killed ether vaccine is clearly abnormal, as the numbers are so small; also, one of the three fatal cases did not complete treatment.

(b) *Superficial.*

	Number treated	Deaths	Mortality per cent
1. Dried cords	1,379	2	0.15
2. Dilutions	3,985	2	0.05
3. Phenol vaccines	7,455	13	0.17
4. Ether vaccines (not killed)	2,478	3	0.16
5. Ether vaccines (killed) . .	1,156	0	0
Total	16,552	20	0.12

(c) *No Visible Lesion.*

In this class there were no deaths. The numbers treated were as follows :

1. Dried cords	173
2. Dilutions	1,245
3. Phenol vaccines	1,345
4. Ether vaccines (not killed)	336
5. Ether vaccines (killed)	164
Total	<u>3,509</u>

The mortality amongst the deeply bitten as compared with those whose bites are superficial is thus in ratio 9.8 to 1.

If, as before, we contrast statistics of persons treated with living vaccines with those treated with killed vaccines, we have :

(a) *Deep Bites.*

	Number treated	Deaths	Mortality per cent
1. Living vaccines	2,819	27	0.96
2. Killed vaccines	8,649	108	1.25

Whence $\chi^2 = 1.55$, and $P = 0.21$.

(b) *Superficial Bites.*

	Number treated	Deaths	Mortality per cent
1. Living vaccines	7,941	7	0.88
2. Killed vaccines	8,611	13	1.51

Whence $\chi^2 = 1.35$, and $P = 0.25$.

Neither of these values of P denotes a significant difference.



10. INTERVENTION OF CLOTHING.

The proportions of persons bitten on the bare skin, and through clothing, are as follows.

	On bare skin	Through clothing
1. Dried cords	75.5	24.4
2. Dilutions	72.0	28.0
3. Phenol vaccines	76.7	23.3
4. Ether vaccines (not killed)	52.4	47.6
5. Ether vaccines (killed)	55.8	44.2
Total	71.8	28.2

The mortalities in the various groups are :

(a) On Bare Skin.

	Number treated	Deaths	Mortality per cent
1. Dried cords	1,790	17	0.95
2. Dilutions	4,517	8	0.18
3. Phenol vaccines	13,099	110	0.84
4. Ether vaccines (not killed)	1,904	9	0.47
5. Ether vaccines (killed)	757	3	0.40
Total	22,355	147	0.66

(b) Through Clothing.

	Number treated	Deaths	Mortality per cent
1. Dried cords	578	0	0
2. Dilutions	1,753	0	0
3. Phenol vaccines	3,972	9	0.23 ¹
4. Ether vaccines (not killed)	1,730	0	0
5. Ether vaccines (killed)	599	0	0
Total	8,792	9	0.10

It appears that the effect of the intervention of clothing is to reduce the mortality in the proportion 6.4 to 1 (*cf.* MCKENDRICK, 1928, where the proportional reduction for 20,000 patients treated at Kasauli was 6.6 to 1).

¹ It is to be remembered that phenol vaccines are mainly employed in the treatment of Indians, whose clothing is very thin.

11. POSITION OF BITE.

The proportion of bites in the different regions is as follows.

	Head	Percentage of bites on :		
		Arm	Trunk	Leg
1. Dried cords	7.5	49.5	2.9	40.1
2. Dilutions	6.7	62.9	0.4	30.0
3. Phenol vaccines	5.3	32.7	4.2	57.8
4. Ether vaccines (not killed)	6.4	47.5	10.6	35.6
5. Ether vaccines (killed)	5.9	27.4	16.7	49.9
Total	5.9	42.0	4.6	47.5

The mortalities according to the various positions are :

(a) Head

	Number treated	Deaths	Mortality per cent
1. Dried cords	173	6	3.47
2. Dilutions	423	5	1.18
3. Phenol vaccines	902	34	3.77
4. Ether vaccines (not killed)	233	5	2.15
5. Ether vaccines (killed)	80	2	2.5
Total	1,825	52	2.85

(b) Arm.

	Number treated	Deaths	Mortality per cent
1. Dried cords	1,147	6	0.52
2. Dilutions	3,989	3	0.08
3. Phenol vaccines	5,579	39	0.70
4. Ether vaccines (not killed)	1,725	4	0.23
5. Ether vaccines (killed)	372	1	0.27
Total	13,101	53	0.40

(c) Trunk.

	Number treated	Deaths	Mortality per cent
1. Dried cords	68	0	0
2. Dilutions	28	0	0
3. Phenol vaccines	717	6	0.84
4. Ether vaccines (not killed)	384	0	0
5. Ether vaccines (killed)	227	0	0
Total	1,435	6	0.42

(d) *Leg.*

	Number treated	Deaths	Mortality per cent
1. Dried cords	930	5	0.54
2. Dilutions	1,828	0	0
3. Phenol vaccines	9,874	40	0.41
4. Ether vaccines (not killed)	1,292	0	0
5. Ether vaccines (killed) . .	677	0	0
Total	14,805	45	0.30

Of the fatal leg cases, four of the five treated by dried cords, and all of the 40 treated by phenol vaccines were Asiatics. All treated by dried cords were bitten on the bare skin, and 37 of the 40 treated by phenol vaccines were bitten on the bare skin.

12. DELAY IN COMMENCEMENT OF TREATMENT.

The following tables indicate the proportions of individuals who commenced treatment after various periods of delay:

	0-4 days	4-7 days	8-14 days	More than 14 days
1. Dried cords	57.8	20.8	13.9	7.6
2. Dilutions	63.5	18.3	13.2	5.0
3. Phenol vaccines	46.6	27.4	17.4	8.6
4. Ether vaccines (not killed)	61.2	23.8	9.0	6.1
5. Ether vaccines (killed)	<u>86.4</u>	<u>6.9</u>	<u>4.1</u>	<u>2.7</u>
Total	54.3	23.6	14.8	7.3

The percentage mortalities for the different periods are as follows:

(a) 0 — 4 days.

	Number treated	Deaths	Mortality per cent
1. Dried cords	1,339	15	1.12
2. Dilutions	4,041	6	0.15
3. Phenol vaccines	8,140	32	0.39
4. Ether vaccines (not killed)	2,223	5	0.22
5. Ether vaccines (killed)	<u>1,172</u>	<u>2</u>	<u>0.17</u>
Total	17,160	60	0.35

(b) 4 — 7 days.

	Number treated	Deaths	Mortality per cent
1. Dried cords	481	1	0.21
2. Dilutions	1,162	2	0.17
3. Phenol vaccines	4,796	39	0.81
4. Ether vaccines (not killed)	864	1	0.12
5. Ether vaccines (killed)	<u>93</u>	<u>1</u>	<u>1.08</u>
Total	7,451	44	0.59

(c) 8 — 14 days.

	Number treated	Deaths	Mortality per cent
1. Dried cords	321	1	0.31
2. Dilutions	842	0	0
3. Phenol vaccines	3,042	26	0.85
4. Ether vaccines (not killed)	326	3	0.92
5. Ether vaccines (killed)	<u>55</u>	<u>0</u>	<u>0</u>
Total	4,687	30	0.64

(d) *More than 14 days.*

	Number treated	Deaths	Mortality per cent
1. Dried cords	177	0	0
2. Dilutions	316	0	0
3. Phenol vaccines	1,508	24	1.59
4. Ether vaccines (not killed)	221	0	0
5. Ether vaccines (killed) . .	36	0	0
Total	2,305	24	1.04

These mortalities may also be tabulated serially :

	0-4 days	5-7 days	8-14 days	More than 14 days
1. Dried cords	1.12	0.21	0.31	0
2. Dilutions	0.15	0.17	0	0
3. Phenol vaccines	0.39	0.81	0.85	1.59
4. Ether vaccines (not killed)	0.22	0.12	0.92	0
5. Ether vaccines (killed) . .	0.17	1.08	0	0
Total	0.35	0.59	0.64	1.04

From this table it appears that the mortality amongst those treated by killed phenol vaccines increases steadily with lateness of arrival. As this group of figures refers mainly to institutes in Asia, this may indicate that lateness of arrival is largely due to the inaccessibility of the various institutes, and the long distances which have to be travelled. No such definite increase in mortality occurs amongst those treated by the other methods. The figures in this case refer mainly to institutes in Europe, where lateness of arrival probably depends not so much upon inaccessibility as upon procrastination on the part of those who are at doubtful risk.

13. PARALYTIC ACCIDENTS.

Eight accidents are reported as having occurred amongst the 31,656 persons who were treated. These were distributed as follows :

	Number treated	Number of accidents	Proportion	
1. Dried cords . . .	2,318	5	1 in 464	(0.22 per cent)
2. Dilutions . . .	6,362	2	1 in 3,181	(0.03 per cent)
3. Phenol vaccines.	17,538	1	1 in 17,538	(0.00006 per cent)
4. Ether vaccines (not killed) . . .	3,634	0	0 in 3,634	
5. Ether vaccines (killed) . . .	1,356	0	0 in 1,356	
6. Mixed	448	0	0 in 448	

Thus, significantly fewer accidents occur with dilutions than with dried cords ($P = 0.00074$), and still less when phenol ($P = \text{less than } 0.0000001$) and ether methods are employed.



14. SUMMARY AND CONCLUSIONS

The statistics relating to persons treated at thirty-one anti-rabies institutes have been analysed and, although this number forms only a small proportion of the number of institutes throughout the world, the following conclusions have been provisionally arrived at.

When the statistics are subdivided into the two race groups — European and non-European — it appears (1) that the non-European group is at a higher state of risk than the European, and (2) that there is no decisive evidence that any clear advantage exists in favour of any one of the various methods of treatment under consideration. In particular it has not been possible to demonstrate superiority of methods employing live vaccines over those in which killed vaccines are used.

Within the European group, the differences between the death rates of the various institutes are not greater than would be expected as the result of chance variations. A similar statement is also true with regard to the non-European group, but it is not true with regard to the whole statistics embracing the two groups.

It is emphasised that the negative conclusion regarding the relative efficiencies of the various methods of treatment are only provisional, and that more positive results may come to light when fuller and larger statistics are available. Likewise, accurate estimation of the part played by the various factors of rabidity, severity of biting, etc., will be possible only when more complete figures have accumulated.

I am deeply indebted to Dr. W. O. Kermack for advice and criticism in the compilation of this report, and in particular for indicating how the distribution of deaths amongst the various institutes could be compared with a random distribution.

15. TABLE I.

Institute	Year	Vaccine	Days of treatment	Number treated	Deaths	Mortality per cent	Paralytic Accidents
<i>1. Dried Cords with or without Preservation in Glycerine</i>							
Warsaw (in-patients)	1927	dried 4-1 days	20	399	3 ¹	0.75	1 ²
Bangkok (in-patients)	1928	„ 12-3 days (Glyc.)	15-25	942	10	1.06	4 ³
„ (out-patients)	1928	„ „ „	„	10	0	0	0
Paris	1928	dried Glyc.	15-25	671	0	0	0
Vilna	1927	„ 8-2 days Glyc.	14-20	283	4	1.41	0
Tangier	1927	„ 4-2 days Glyc.	9-29	13	0	0	0
<i>2. Modified Dilution Methods</i>							
Budapest	1927	modified Högyes	9-21	4,835	4	0.08	1 ⁴
Berlin	1928	Högyes-Phillips	20	109	1	0.9	1 ²
Dresden	1928	„ „	„	58	0		0
Munich	1928	„ „	„	19	1	5.3	0
Sträubing (male)	1928	„ „	„	17	0		0
„ (female)	1928	„ „	„	16	0		0
Rogensburg	1928	„ „	„	15	0		0
Nuremberg	1928	„ „	„	5	0		0
Würzburg	1928	„ „	„	1	0		0
Riga (in-patients)	1927	dried 1 day Glyc.	18-21	355	2	0.56	0
„	1928	„ „	„	296	0		0
„ (out-patients)	1927	dried 1 day phenol Glyc.	„	234	0		0
„	1928	„ „	„	188	0		0
Helsingfors	1926	dried 1 day Glyc.	12-21	104	0		0
„	1927	„ „	„	110	0		0

¹ Two deaths in Category D.

² Recovered.

³ All recovered.

⁴ Fatal case, died 36 days after commencement of treatment.

Institute	Year	Vaccine	Days of treatment	Number treated	Deaths	Mortality per cent	Paralytic Accidents
3. Killed Phenol Vaccines							
Calcutta	1927	700 mg. Semple	14	6,475	61	0.94	0
Warsaw (out-patients)	1927	2,000 mg. "	20	1,477	1	0.06	0
Shillong	1927	700 mg. "	14	1,146	15	1.30	0
Colombo	1927	700-1,000 mg. "	14-20	1,083	6	0.55	0
Palestine	1927	700 mg. "	14	788	0		0
Bombay (in-patients)	1927	" "	"	729	5	0.68	0
" (out-patients)	1927	" "	"	4,432	25	0.56	0
Shanghai	1927	750 mg. "	15	189	5	2.64	0
Kuala-Lumpur (in-patients)	1927	700-1,050 mg. "	14-21	146	1	0.68	0
" (out-patients)	1927	" "	"	52	0		0
Breslau	1928	700-1,400 mg. "	14	136	0		0
Lwow (in-patients)	1927	Mulford 200 mg.	20	126	0		0
" (out-patients)	1927	dried substance	"	759	0		1 ¹
4. Ether Vaccines (not killed)²							
Nish	1926	Högyes-Alivisatos 40-300 cc.	—	1,526	3	0.19	0
Sarajevo	1926	Ether (96 hours) Glyc.	—	575	2	0.35	0
"	1927	" " "	—	796	3	0.37	0
Zagreb	1926	Ether (72 hours) Glyc.	—	737	1	0.13	0
5. Ether Vaccine (killed)							
Belgrade	1927	Ether (120 hours) Phenol-glycerine	—	1,356	3 ³ (2)	0.22 ³ (0.14)	0
6. Mixed Group							
Vienna	1927	light cases : Högyes severe cases : Högyes -Alivisatos (Ether 72 hours)	—	448	0		0

¹ Recovered.

² In the succeeding statistics, for method and duration of treatment *vide* protocols.

³ One fatal case did not complete treatment.

Sample of the Questionnaire sent to the Pasteur Institutes.
and the Answers to which are given in the following pages.

RESULTS OF ANTI-RABIES TREATMENT.

Patients treated at Institute¹ during
the year

1. Method of treatment² :
 - (a) Schemes of dosage for light, medium and severe cases.
 - (b) If a preservative, such as glycerine or carbolic acid is used, during what period of preservation is the vaccine considered to be efficient ?

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients				
3. Classification according to races :				
.....				
.....				
.....				
4. Classification according to variety of biting animal :				
Dog				
Cat				
Wolf				
Jackal				
Solipeds				
Ruminants				
Other animals				
5. Evidence of rabies in biting animal :				
Category A				
" B				
" C				
" D				

¹ A separate form to be used for patients treated outside the Institute.

² If more than one method of treatment used, a schedule should be filled in for each group.

	Number of cases	Percentage of total	Number of fatal cases	Percentage of mortality
6. Depth of lesion :				
Deep				
Superficial				
No visible lesion				
7. Interposition of clothing :				
On bare skin				
Through clothing				
8. Position of bite :				
Head				
Arm				
Trunk				
Leg				
Multiple bites to be classified according to site of greatest danger, <i>i.e.</i> , in order : head, arm, trunk, leg.				
9. Number of days after bite when treatment was begun :				
0 — 4				
5 — 7				
8 — 14				
15 — 21				
Over 21 days				
10. Any further information or facts pertaining to the above figures.				
11. Steps that have been taken regarding following-up of subsequent history; 6 or 12 months ¹ .				
12. If paralytic accidents have been observed during the year, please give as detailed information as possible.				
13. Information regarding each fatal case of rabies. The entries to be made according to the foregoing system of classification (as exemplified in the case detailed on the attached form.)				

¹ " Each Institute should report its *total* mortality. In this connection, it is desirable that each Institute should follow the after history of its patients for at least six months and, whenever possible, for a period of one year after the termination of treatment; the co-operation of the local authorities should be enlisted for this purpose. Each Institute should intimate what it has been able to do regarding this matter." — Recommendation adopted by the International Rabies Conference.

Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
Dried cord	Severe case	21 days	European	Dog	A	Deep	On Bare Skin	Head	3 days	30 days	N/B	Guinea-pig

ANNEXES.

Annex I.

AUSTRIA.

FEDERAL ANTI-RABIES VACCINATION INSTITUTE,
VIENNA IX, 25a WÄHRINGERSTRASSE.

1927.

1. Method of treatment: Högyes and Högyes combined with Alivisatos (Cf. document C. H. 487(c)).

(a) *For light cases:*

Högyes Method, with injections during 13 days, according to the following scheme:

1st day	1	cc.	of	1:500	dilution
2nd	2	„	„	1:500	„
3rd	3	„	„	1:500	„
4th	4	„	„	1:500	„
5th	1	„	„	1:100	„
6th	1.5	„	„	1:100	„
7th	2	„	„	1:100	„
8th	2.25	„	„	1:100	„
9th	2.5	„	„	1:100	„
10th	2.75	„	„	1:100	„
11th	3	„	„	1:100	„
12th	3.25	„	„	1:100	„
13th	3.5	„	„	1:100	„

(b) *For severe cases:*

Method of Högyes, as indicated above, if possible combined during the six first days with the Alivisatos method, *i.e.*, 10 cc. of emulsion at 10 per cent of brain in ether (duration of immersion of the brain in ether: 72 hours).

Add. to (a): Amongst the 448 persons vaccinated in the course of the year 1927, 369 have been treated with the Högyes method and 79 with the Högyes method combined with the Alivisatos one.

Add. to (b): The brain and the cord freshly extracted are either used immediately, or preserved in the refrigerator in a solution of salted glycerine at 1:2 for a period up to 10 days. The virus preserved longer than 10 days in glycerine is not used any more. No carbolised virus is used.

The total number of bites known to the Institute for the year is 1,629. A total of 917 persons have been sent away without treatment, 264 did not undergo the complete treatment, the biting animal having been recognised as being healthy or the patient not having attended.

Only 448 persons received the full course of inoculations; no death occurred.

The Institute does not apply any treatment outside the establishment.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	448			
3. Classification according to races :				
White race	448			
4. Classification according to variety of biting animal :				
Dog	300	66.93		
Cat	38	8.49		
Rats	3	0.66		
Rabbits	2	0.44		
Solipeds	4	0.89		
Ruminants	95	21.22		
Pigs	1	0.22		
Monkeys	3	0.66		
Bitten by or in contact with man	2	0.44		
5. Evidence of rabies in biting animal :				
Category A				
" B				
" C				
" D ¹				
6. Depth of lesion :				
Deep	103	23		
Superficial	99	22.09		
No visible lesion	246	54.91		
7. Interposition of clothing :				
On bare skin	288	64.29		
Through clothing	160	35.71		
9. Number of days after bite when treatment was begun :				
0 — 4	245	54.69		
5 — 7	55	12.27		
8 — 14	101	22.55		
15 — 21	15	3.35		
Over 21 days	32	7.14		

¹ We have no heading "D". On the contrary — as we have already mentioned — the cases in which the healthy condition of the biting animal has eventually been proved are struck off the statistical tables.

11. The inoculated persons remain under observation of a medical officer during a year.
 13. No death amongst the vaccinated. The Institute was informed of three deaths in Austria from rabies among unvaccinated persons :
 - (1) Bite on the cheek : Incubation 49 days ; Negri : positive.
 - (2) Bite on the lobe of the ear : Incubation 2 $\frac{1}{2}$ months ; Negri : positive.
 - (3) Bite on the right hand : Incubation 23 days ; Negri : positive.
-

Annex II.

FINLAND.

PASTEUR INSTITUTE, HELSINGFORS.

1926.

1. Method of treatment : Dried cord.

(a) Schemes of dosage :

Light cases : 12 injections	} of 1 mm. dried cord (during 24 hours) in 1 cc. of physiological sa- liné solution.
Medium cases : 16 injections	
Severe cases : 21 injections	

(b) The cord preserved in glycerine is considered efficient up to 12 days.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	104			
3. Classification according to races :				
Finns	104			
4. Classification according to variety of biting animal :				
Dog	71	68.3		
Cat	24	23.0		
Solipeds	2	2.0		
Ruminants	7	7.0		
5. Evidence of rabies in biting animal :				
Category A positive microscopically	80	77		
,, B posit. clinically	10	9.6		
,, C uncertain	6	5.8		
,, D negative	8	7.6		
6. Depth of lesion :				
Deep	14	13.5		
Superficial	51	49		
No visible lesion	39	37.5		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
7. Interposition of clothing:				
On bare skin	85	81.7		
Through clothing	19	18.3		
8. Position of bite:				
Head	8	7.7		
Arm	80	77		
Trunk	1	1		
Leg	15	14.3		
9. Number of days after bite when treatment was begun:				
0 — 4	50	48		
5 — 7	32	31		
8 — 14	8	7.7		
15 — 21	14	13.3		

11. The total mortality for 1916-1926 was 0.24 per cent.

12. No paralytic accidents observed during the year.

Annex IIbis.

FINLAND.

PASTEUR INSTITUTE, HELSINGFORS.

1927.

1. Method of treatment : Dried cord.

(a) Schemes of dosage :

For severe cases : 21 injections
 For medium cases : 16 injections
 For light cases : 12 injections

} of 1 mm. dried cord
 (during 24 hours) in
 } 1 cc. of physiological solution.

(b) The cord preserved in glycerine is considered efficient up to 12 days.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	110			
3. Classification according to races :				
Finns	110			
4. Classification according to variety of biting animal :				
Dog	83	75.5		
Cat	26	23.6		
Rat	1	0.9		
5. Evidence of rabies in biting animal :				
Category A + microscopically	79	71.9		
" B + clinically	10	9.1		
" C uncertain	10	9.1		
" D negative	11	10		
6. Depth of lesion :				
Deep	50	45.5		
Superficial	48	43.5		
No visible lesion	12	11		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
7. Interposition of clothing :				
On bare skin	92	83.6		
Through clothing	18	16.4		
8. Position of bite :				
Head	17	15.5		
Arm	78	70.9		
Trunk	3	2.7		
Leg	12	10.9		
9. Number of days after bite when treatment was begun :				
0 — 4	15	13.6		
5 — 7	20	17.3		
8 — 14	56	50.9		
15 — 21	2	1.7		
Over 21 days	17	15.5		

11. The total mortality for 1916-1927 was 0.22 per cent.

12. No paralytic accident was observed during the year.

Annex III.

FRANCE.

PASTEUR INSTITUTE, PARIS.

1928.

1. Method of treatment : Dried cord preserved in glycerine.

Schemes of dosage :

Light cases : 15 days ;

Medium cases : 18 days ;

Severe cases : 25 days.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	671			
3. Classification according to races :				
Europeans	671			
4. Classification according to variety of biting animal :				
Dog	518	79		
Cat	138	20		
Ruminants	7	1		
Other animals	8	1		
5. Evidence of rabies in biting animal :				
Category A	76	11		
" B	208	30.9		
" C	387	57.6		
" D	—	—		
6. Depth of lésion :				
Deep	249	37		
Superficial	318	47		
No visible lesion	104	15		
7. Interposition of cloth- ing :				
On bare skin	497	74		
Through clothing	174	26		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
8. Position of bite :				
Head	43	6.4		
Arm	445	67		
Trunk	4	0.1		
Leg	179	26.6		
Multiple bites classified according to site of greatest danger, i.e., in order: head, arm, trunk, leg.	22	8.9		
	189	76.2		
	1	0.4		
	36	14.5		
9. Number of days after bite when treatment was begun :				
0 — 4	296	44		
5 — 7	192	29		
8 — 14	127	19		
15 — 21	39	8.3		
22 — 27	17	2.5		

11. Treated persons and their family are requested to keep us informed of any accident occurring to the patient. The same request is addressed to the physicians, and veterinary surgeons who had anything to do with the case and to the sanitary authorities of the districts inhabited by the patient.
12. No paralytic accident was observed during the year.
13. No fatal case of rabies.

STATISTICS 1903-1927.

25 years.

Persons treated : 20,118. Deaths : 37. Mortality per 100 = 1.84.

Bites on the Head.

Table A : The biting animal has been experimentally proved rabid by the development of the disease in the animal bitten by it or by inoculation with its bulb.

Table B : The biting animal has been proved rabid by veterinary examination.

Table C: The biting animal is suspected of rabies.

Table A: Persons treated: 390. Deaths: 5. Mortality per 100 = 1.28.

Table B: Persons treated: 832. Deaths: 3. Mortality per 100 = 0.37.

Table C: Persons treated: 503. Deaths: 3. Mortality per 100 = 0.06.

Treated persons bitten on the head: 1,725.

Deaths: 11.

Mortality: 1.57 per cent.

(From a Lecture by M. Bouley.)

Of 320 persons bitten by rabid animals (and untreated) 129 died of rabies. Result of an enquiry carried out between 1863 and 1868 (mortality of 40.4 per cent).

Annex IV.

GERMANY

ROBERT KOCH INSTITUTE, BERLIN.

1928.

1. Method of treatment: Högyes-Phillips (Cf. document C. H. 487 (a)).

The glycerinated vaccine is used in the fresh state for a period of time not exceeding 15 days.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	109		1	0.9
3. Classification according to races :				
Europeans	109			
4. Classification according to variety of biting animal :				
Dog	89	82.4	1	1.1
Cat	12	11.1		
Ruminants	7	6.5		
5. Evidence of rabies in biting animal :				
Category A	39	36.1		
" B	5	4.6	1	20
" C	59	54.6		
" D	5	4.6		
6. Depth of lesion :				
Deep	81	75	1	1.2
Superficial	20	18.5		
No visible lesion	7	6.5		
7. Interposition of clothing :				
On bare skin	72	66.7	1	1.4
Through clothing	36	33.3		
8. Position of bite :				
Head	10	9.3	1	10
Arm	66	61.1		
Trunk	—	—		
Leg	32	29.6		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
9. Number of days after bite when treatment was begun :				
0 — 4	52	48.1	1	1.9
5 — 7	16	14.8		
8 — 14	31	28.7		
15 — 21	4	3.7		
Over 21 days	5	4.5		

10. Another patient — included only in the general number of persons treated — had been infected by street virus, in the course of laboratory experiments.

11. The district health officers are entrusted with the following-up of the treated cases, for a period of one year.

12. A patient, who had been bitten by an animal of Category A showed slight polyneuritic symptoms a few days after the conclusion of treatment. So far, nothing further has been heard of the development of the illness, more particularly concerning possible paralysis.

13. A child 7 years old developed meningitis three days after the conclusion of treatment which he had stood without reaction. Violent headaches were the predominating symptom. Lumbar punctures showed a very high pressure and yielded a great quantity of fluid, first turbid and then clear, the examination of which revealed streptococci. The intra-lumbar injection of serum and intra-muscular injection of blood of a person who had been inoculated a short time previously gave no result. Slight but typical symptoms of hydrophobia appeared on the third day of the illness: marked salivation, spasm of deglutition, hydrophobia, agitation. Death occurred the same day. Post-mortem examination did not reveal anything abnormal. The microscopic examination showed infiltrations with inflammatory reaction in the spinal cord, infiltrations which are characteristic of rabies. Negri bodies could not be demonstrated. The inoculation of guinea-pigs or rabbits with different parts of the brain induced rabies without any possible doubt. These animals died after a long incubation (24-66 days) and after having shown all the characteristic symptoms. The microscopic examination of their nervous system revealed Negri bodies.

See following table.

Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
Högyes-Phillips	—	20 days	Europeans	Dog	B	Deep	On bare skin	Face	1 day	26 days	N. B.	Rabbits and guinea-pigs Negri bodies were present

Annex V.

GERMANY.

PASTEUR INSTITUTE, BRISLAU.

1928.

1. Method of treatment : Semple (Cf. document C. H. 487 (d)).

(a) Schemes of dosage :

For severe cases (8a, 9d) the period of treatment is doubled.

(b) The vaccine is considered to be efficient for two months.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	136			
3. Classification according to races :				
Europeans	136			
4. Classification according to variety of biting animal :				
Dog	126	92.6		
Cat	9	6.6		
Ruminants	1	0.8		
5. Evidence of rabies in biting animal :				
Category A	30	22		
" B	1	0.8		
" C ¹	36	26.5		
" D	69	50.7		
6. Depth of lesion :				
Deep	29	21.4		
Superficial	94	69.1		
No visible lesion	13	9.5		
7. Interposition of clothing :				
On bare skin	71	52.2		
Through clothing	65	47.8		

¹ In category C, four cases are included for which the diagnosis has not yet been definitely ascertained, the animal inoculations not being yet completed.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
8. Position of bite :				
Head	14	10.3		
Arm	58	42.6		
Trunk	5	3.7		
Leg	59	43.4		
9. Number of days after bite when treatment was begun :				
0 — 4	95	69.8		
5 — 7	24	17.6		
8 — 14	12	8.8		
15 — 21	5	3.8		

- 11. A printed form is sent to the police authorities and the district health officers to be filled in.
- 12. No paralytic accidents have been observed during the year.
- 14. No fatal case of rabies.

Annex VI.

GERMANY.

STATE LYMPH INSTITUTE, DRESDEN.

1928.

1. Method of treatment: Högyes-Phillips as in Berlin. (Cf. C. H. 487 (a)).
 - (a) Schemes of dosage. Absolutely the same as in Berlin.
 - (b) The vaccine is considered to be efficient during 5 weeks.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	58			
3. Classification according to races:				
Europeans	58	100		
4. Classification according to variety of biting animal:				
Dog	50	86.2		
Cat	8	13.8		
5. Evidence of rabies in biting animal:				
Category A	29	50		
" B	4	6.9		
" C	23	39.6		
" D	2	3.4		
6. Depth of lesion:				
Deep	8	13.8		
Superficial	31	53.4		
No visible lesion	19	32.7		
7. Interposition of clothing:				
On bare skin	27	46.5		
Through clothing	12	20.7		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
8. Position of bite :				
Head	—	—		
Arm	27	46.5		
Trunk	1	1.7		
Leg	11	18.9		
9. Number of days after bite when treatment was begun :				
0 — 4	22	37.9		
5 — 7	6	10.3		
8 — 14	18	31.2		
15 — 21	6	10.3		
Over 21 days	6	10.3		

12. No paralytic accident has been observed during the year.

14. No fatal case of rabies.

Annex VII.

GERMANY.

SCHWABING HOSPITAL, MUNICH-SCHWABING.

1928.

1. Method of treatment: Fresh glycerinated cord from the Institute "Robert Koch", Berlin.
The vaccine is considered to be efficient for 14 days.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	19		1	5.3
3. Classification according to races:				
Europeans	19	100		
4. Classification according to variety of biting animal:				
Dog	13	68.4	1	7.7
Cat	1	5.3		
Ruminants	4	21.1		
Pig	1	5.3		
5. Evidence of rabies in biting animal:				
Category A	}		unknown	
" B				
" C				
" D				
6. Depth of lesion:				
Deep	1	5.6	1	100
Superficial	16	88.9		
No visible lesion	1	5.6		
7. Interposition of clothing:				
On bare skin	17	89.5		
Through clothing	2	10.5		
8. Position of bite:				
Head	3	16.7		
Arm	9	50	1	11.1
Leg	6	33.3		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
9. Number of days after bite when treatment was begun :				
0 — 4	9	47.4		
5 — 7	3	15.8		
8 — 14	3	15.8		
15 — 21	1	5.3		
Over 21 days	3	15.8		

11. Cases are notified to the competent district authorities with the request to examine them after a period of one year.

12. No paralytic accidents observed during the year, with the exception of the fatal case (*cf.* No. 13).

13. *Extract of the Patient's History.* — No previous illness. Four weeks before had been bitten by a dog on the forefinger of the left hand and on the upper and lower left arm. Then underwent complete treatment in the Schwabing Hospital. Eight days before leaving the Hospital, amputation of the bitten forefinger at the level of the first knuckle because of suppuration of the bone. The following symptoms had been noted at the hospital: Paresis of the left side of the face, of the left hypoglossal nerve, disturbance of ocular co-ordination, diplopia, the external rectus of the eye being more particularly affected. Absence of reflectivity of the abdominal walls; alternated knee-jerk and clonus of the foot. More accentuated reflex action first to the right, then to the left, Babinski and Oppenheim reflexes on the left foot, ataxy of the left extremity. Hypotonus of the right leg, no disturbance of the sensitivity. Mitral defect, decompensation of the heart. Suppuration at the sites of the bites. *Diagnosis:* Encephalitis, multiple embolism (at the site of the suppuration (?)) Mitral insufficiency (?). Several attacks of angina pectoris during his stay at the hospital. Stay at the hospital: from August the 20th to September the 8th, 1928. Died out of the hospital. No post-mortem. The correlation between the illness and the anti-rabies inoculation is very doubtful.

Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
Högyes-Philipps	—	20 days	European	Dog	Unknown	Deep	On bare skin and through clothing	Left hand and lower part of left leg	Arrived the same day	Unknown	—	—

Annexes VIII, IX, X, XI and XII.

**DATA FURNISHED BY GERMAN INSTITUTIONS USING
THE GLYCERINATED CORD METHOD AS APPLIED AT
THE ROBERT KOCH INSTITUTE, BERLIN.**

The total number of patients treated by the five institutions being 54 only, percentages of each are considered insignificant. Among the total of 54 cases there was no death or paralytic accident.

Number of patients treated reported upon was :

Municipal General Hospital, Nuremberg (April 1st,
1927-March 31st, 1928): 5 cases.

General Hospital, Ratisbon (1928): 15 cases.

Krankenhaus der Barmherzigen Brüder, Straubing (1928):
17 cases.

Weibliches Krankenhaus, Straubing (1928): 16 cases.

Luitpold Krankenhaus, Würzburg (1928): 1 case.

Annex XIII.

HUNGARY.

PASTEUR INSTITUTE, BUDAPEST.

1927.

1. Method of treatment: Högyes dilution method modified (Cf. document C. H. 487 (a)).

(a) For adults :

I II III	}	1st day dilution of 1/2000 ; 4 cc.
		2nd " " " 1/1000 ; 4 cc.
		3rd " " " 1/5000 ; 3 cc.
		4th " " " 1/5000 ; 4 cc.
		5th " " " 1/2000 ; 2 cc.
		6th " " " 1/2000 ; 3 cc.
		7th " " " 1/1000 ; 2 cc.
		8th " " " 1/1000 ; 2.25 cc.
		9th " " " 1/1000 ; 2.5 cc.

Delicate individuals and children according to their age are given only part of these doses

(for mild cases of the legs and body with slight bleeding).

10th day dilution of 1/100; 2.75 cc.

13th day dilution of 1/100; 3 cc.

(in the case of superficial bites on the hands or deeper bites on the arms, the trunk and lower extremities).

For children, as above

15th day dilution of 1/100 ; 3 cc.

17th " " 1/100 ; 3 cc.

(in the case of deep wounds on any part of the body).

For children, as above

Note. — In the case of bites on the hands and the face, caused by animals known to be infected with rabies, we have, during the last six months, begun to give a fourth vaccination, that is : 4 cc. of a 1/500 dilution, and we have increased the dose according to the degree of individual tolerance. Children only received the amount of dosage fitting to their age.

(b) We preserve the fixed virus cord in a 50 per cent solution of glycerine to which 0.5 per cent of phenol has been added and we use it after 24 hours for the emulsion. Experience has shown that fixed virus preserved in the ice - chest, keeps its potency for 28 days, but we make a practice of never using it after 9 to 13 days. The spinal cord loses its potency at the end of 3 days if preserved at 37° C. in the above - mentioned solution.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	4,835		4	0.083
3. Classification according to races :				
Europeans	4,835			
Hungarians				
4. Classification according to variety of biting animal :				
Dog	3,783	78.24	4	0.10
Cat	400	8.27		
Solipeds	33	0.68		
Ruminants	408	8.43		
Other animals	211	4.36		
5. Evidence of rabies in biting animal :				
Category A	279	5.77	1	0.11
" B	897	18.55		
" C	3,654	75.67		
6. Depth of lesion :				
Deep	938	19.40	4	0.42
Superficial	3,293	68.10		
No visible lesion	604	12.49		
7. Interposition of clothing :				
On bare skin	3,443	71.18	4	0.11
Through clothing	1,393	28.71		
8. Position of bite :				
Head	287	5.93	4	1.39
Trunk	2,942	60.84		
Leg	1,606	33.21		
9. Number of days after bite when treatment was begun :				
0 — 4	3,502	72.43	3	0.086
5 — 7	771	15.94	1	0.13
8 — 14	426	8.81		
15 — 21	136	2.81		

10. The mortality rate amongst the 4,835 persons infected and vaccinated is 0.08 per cent. The figures in Category D referring to bites by healthy animals is not taken into account in computing this percentage.
11. Information is received through the administrative authorities and reports concerning individuals with deep bites are obtained after 6 months and in serious cases at the end of 12 months.
12. A single paralytic accident has been recorded among individuals after having left the Institute.

This was the case of a woman who became ill in the country and died with symptoms of acute infectious ascending myelitis.

We have been able to collect the following details in respect of this case. Mme B. S., 36 years of age, the wife of a schoolmaster, thin and very pallid. Suffered much from headache and nervous pain. For this reason was said to take frequently large amounts of tonics and as much as 5 to 10 grammes of aspirin a day. Between November 15th and 20th, 1927, her dog became ill and was destroyed as it was suspected to be suffering from rabies. She attended to her dog and during this time excoriations present on her skin were covered with saliva from the animal. These were not washed immediately and were not disinfected. On November 25th, she came to the Institute and was treated in accordance with the second category of doses, vaccination being continued to December 10th. During the vaccination she was very nervous and stated that she suffered from it very considerably.

Her doctor, on December 23rd, made the following report: Mme B. S., when she became ill, suffered from abdominal pain and spinal pain extending throughout the whole length of the back from the lower part upwards. Her body was very sensitive to touch and she suffered from insomnia. On December 18th, her temperature was 40° C. and the abdominal and dorsal muscles were contracted in tonic and clonic spasms accompanied by hiccough and vomiting. Kernig negative. After the attacks she suffered severe pain which was eased by the use of hot compresses. There was no loss of consciousness. On December 19th, the use of a catheter was necessary and the administration of an enema which was retained. The temperature was again 40° C. Towards the evening of the same day the pain became extreme and continued until 1.30 P. M. on the following day, when she died.

At no time was there any sign suggestive of hydrophobia. The patient was not suffering from convulsions and was able to take food without difficulty. In spite of repeated efforts it has been impossible to obtain further information.

Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
Högyes dilution method	III	18 days	European (Hungarian)	Dog	C	Deep	bare skin	nose and palate	1 day	20 days	rabies	
Fixed virus	III	17 "	"	"	C	penetrating the muscle	"	face	same day	18 "	—	
"	III	19 "	"	"	B	Deep	"	ear and mouth	6 days	35 "	rabies	
"	III	21 "	"	"	C	"	"	face	3 "	26 "	"	

Annex XIV.

LATVIA.

PASTEUR INSTITUTE, RIGA.

1927.

1. Method of treatment (Cf. document C. H. 487 (d)):

(a) Emulsion at 3-4 per cent of *dried cord* (during 24 hours at 18° C.) prepared *ex tempore*; is preserved in a solution of 50 per cent glycerine in physiological solution. The injections consisting of 2 cc. of emulsion are made daily during 18 to 21 days according to the gravity of the cases. For the preparation of the emulsion, cords preserved longer than 3 weeks are never used.

(b) The carbolised vaccine used for cases treated outside the Institute is considered to be efficient for a period of 2 months.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	355		2	0.56
3. Classification according to races :				
Europeans	355		2	0.56
4. Classification according to variety of biting animal :				
Dog	295	83.10		
Cat	30	8.45		
Sheep	2	0.56		
Pig	2	0.56		
Solipeds	6	1.69		
Ruminants	16	4.50		
Man	4	1.12		
5. Evidence of rabies in biting animal :				
Category A	80	22.53		
" B	61	17.18		
" C	214	60.28		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
6. Depth of lesion :				
Deep	6	1.69		
Superficial	170	47.88		
No visible lesion	179	50.70		
7. Interposition of clothing :				
On bare skin	237	66.76		
Through clothing	98	27.60		
8. Position of bite :				
Head	18	5.07		
Arm	250	70.42		
9. Number of days after bite when treatment was begun :				
0 — 4	117	32.95		
5 — 7	102	28.73		
8 — 14	89	25.07		
15 — 21,	23	6.47		
Over 21 days	24	6.76		

11. The treated cases remain under observation of the district medical officer and practitioner 12 months after the conclusion of treatment.

12. No paralytic accident has been observed during the year.

13. Information regarding each fatal case of rabies :
See following table.

Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
Dried cord during 24 hours	Ordinary method of the Institute (see p.65)	18 days	European	Dog	A	Superficial	bare skin	finger	2 days	25 days	post-mortem	
"	"	18 "	"	"	A	"	"	finger	5 "	208 "	no post-mortem	

Annex XIVbis.

LATVIA.

PASTEUR INSTITUTE, RIGA.

1928.

1. Method of treatment: Cf. annex XIV and document C. H. 487d.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients.	296			
3. Classification according to races :				
Europeans	296			
4. Classification according to variety of biting animal :				
Dog	225	76		
Cat	52	17.56		
Solipeds	9	3.3		
Ruminants	10	3.37		
5. Evidence of rabies in biting animal :				
Category A	89	30		
" B	47	15.87		
" C	160	54.06		
6. Depth of lesion :				
Deep	12	4.054		
Superficial	131	44.256		
No visible lesion	153	51.689		
7. Interposition of clothing :				
On bare skin	226	76.351		
Through clothing	70	23.648		
8. Position of bite :				
Head	37	12.5		
Arm	190	64.189		
Trunk	7	2.364		
Leg	62	20.945		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
9. Number of days after bite when treatment was begun :				
0 — 4	99			
5 — 7	88			
8 — 14	77			
15 — 21	23			
Over 21 days	9			

11. Cf. annex XIV.

12. No paralytic accident has been observed during the year.

13. No fatal case of rabies.

Annex XIVter.

LATVIA.

PATIENTS TREATED OUTSIDE THE PASTEUR INSTITUTE, RIGA.

1927.

1. Method of treatment: Cf. annex XIV and document C. H. 487d.

The carbolised vaccine used for out-patients is considered efficient for a period of 2 months.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	234			
3. Classification according to races :				
Europeans	234			
4. Classification according to -variety of biting animal :				
Dog	143	58.60		
Cat	27	11.06		
Pig	2	0.80		
Solipeds	1	0.40		
Ruminants	59	24.18		
Man	2	0.80		
5. Evidence of rabies in biting animal :				
Category A	80	32.78		
" B	65	26.63		
" C	89	36.47		
6. Depth of lesion :				
Deep	7	2.82		
Superficial	97	39.75		
No visible lesion	130	53.27		
7. Interposition of clothing :				
On bare skin	199	81.55		
Through clothing	35	14.34		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
8. Position of bite :				
Head	27	11.06		
Arm	170	69.79		
Trunk	3	1.22		
Leg	34	13.93		
9. Number of days after bite when treatment was begun :				
0 — 4	65	26.63		
5 — 7	74	30.32		
8 — 14	61	25		
15 — 21	26	10.65		
Over 21 days	8	3.27		

11. Cf. annex XIV.

12. No paralytic³ accident has been observed during the year.

13. No fatal case of rabies.

Annex XIVquater.

LATVIA.

PATIENTS TREATED OUTSIDE THE PASTEUR INSTITUTE, RIGA.

1928.

1. Method of treatment: Cf. annex XIV and document C. H. 487d.

The carbolised vaccine used for patients outside the Institute is considered efficient for 2 months.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	188			
3. Classification according to races:				
Europeans	188			
4. Classification according to variety of biting animal:				
Dog	128	68.085		
Cat	27	13.297		
Pig	2	1.063		
Solipeds	5	3.659		
Ruminants	26	13.829		
5. Evidence of rabies in biting animal:				
Category A	49	26.0638		
" B	44	23.4042		
6. Depth of lesion:				
Deep	7	3.723		
Superficial	87	46.276		
No visible lesion	94	50		
7. Interposition of clothing:				
On bare skin	150	79.7872		
Through clothing	38	20.2127		
8. Position of bite:				
Head	11	5.8510		
Arm	144	76.595		
Trunk	5	2.659		
Leg	38	14.893		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
9. Number of days after bite when treatment was begun :				
0 — 4	78	41.489		
5 — 7	37	18.611		
8 — 14	67	35.637		
15 — 21	2	1.063		
Over 21 days	4	2.127		

11. Cf. annex XIV.

12. No paralytic accident has been observed during the year.

13. No fatal case of rabies.

Annex XV.

NETHERLANDS.

PASTEUR INSTITUTE, UTRECHT.

1. Method of treatment: Pasteur dried cord. (Cf. document C. H. 487d.)

No case treated in 1927.

Annex XVI.

POLAND.

THE STATE HYGIENE INSTITUTE, LWOW.

1927.

1. Method of treatment: Dried cord (Cf. document C. H. 487 (c)).

(a) For all cases: 20 doses: 2 cc. daily of emulsion containing 0.5 gr. of dried myelo-encephalic substance in 100 cc.

(b) The carbolised vaccine (H. K. Mulford Laboratories) used is considered efficient for 6 months.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	126			
3. Classification according to races:				
Europeans	126	100		
4. Classification according to variety of biting animal:				
Dog	120	95.32		
Cat	3	2.34		
Other animals	3	2.34		
5. Evidence of rabies in biting animal:				
Category A	31	24.60		
" B	33	26.19		
" C	17	13.49		
" D	45	35.72		
6. Depth of lesion:				
Deep	26	20.63		
Superficial	90	71.44		
No visible lesion	10	7.93		
7. Interposition of clothing:				
On bare skin	104	82.54		
Through clothing	22	17.46		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
8. Position of bite :				
Head	4	3.17		
Arm	87	69.07		
Trunk	6	4.75		
Leg	29	23.01		
9. Number of days after bite when treatment was begun :				
0 — 4	72	63.16		
5 — 7	24	19.04		
8 — 14	19	15.08		
15 — 21	10	7.93		
Over 21 days	1	0.79		

11. The official medical officer is entrusted with the observation of the treated cases for a period of one year, and must communicate the results of his observations.
12. No paralytic accident has been observed during the year.
13. No fatal case of rabies.

Annex XVibis.

POLAND.

PATIENTS TREATED OUTSIDE THE STATE HYGIENE INSTITUTE, LWOW.

1927.

1. Method of treatment: Dried cord (Cf. document C. H. 487 (c)).

(a) For all cases: 20 doses: *daily*: 2 cc. of emulsion containing 0.5 gr. of myelo-encephalic substance in 100 cc.

(b) The carbolised vaccine (H. K. Mulford Laboratories) used is considered efficient for 6 months.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	759 ¹			
3. Classification according to races:				
Europeans	759	100		
4. Classification according to variety of biting animal:				
Dog	717	94.33		
Cat	27	3.55		
Solipeds	3	0.46		
Ruminants	9	1.20		
Other animals	3	0.46		
5. Evidence of rabies in biting animal:				
Category A	190	25.03		
" B	112	14.75		
" C	428	64.40		
" D	29	3.82		
6. Depth of lesion:				
Deep	29	3.82		
Superficial	692	91.18		
No visible lesion	38	5		

¹ The total number of vaccinated reached 1,122, but 363 protocols have not been returned.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
7. Interposition of clothing :				
On bare skin	455	59.95		
Through clothing	304	40.05		
8. Position of bite :				
Head	27	3.55		
Arm	444	63.83		
Trunk	37	4.87		
Leg	251	31.75		
9. Number of days after bite when treatment was begun :				
0 — 4	439	57.86		
5 — 7	170	22.39		
8 — 14	106	13.96		
15 — 21	23	3.03		
Over 21 days	21	2.76		

11. The official officer of health is entrusted with the observation of all treated cases for a period of one year and he must communicate the result of his observations.
12. One paralytic accident has been observed : a student, aged 27 years, touched with the saliva of the dog "B" began the treatment 8 days later. The treatment had to be interrupted after the 12th dose, owing to loss of strength in the arms and legs and to eye trouble ; symptoms which the physician did not describe accurately.
13. No fatal case of rabies.

Annex XVII.

POLAND.

STATE HYGIENIC INSTITUTE, WARSAW.

1927.

1. Method of treatment : Pasteur (*Cf.* document C. H. 487 (*d*)).

(*a*) For all cases : 20 doses : 2 cc. daily of Pasteur vaccine ;
cords dried from 1 to 4 days.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	399		3	0.75
3. Classification according to races :				
White	399	100	3	0.75
4. Classification according to variety of biting animal :				
Dog	372	93.1	3	0.80
Cat	23	5.9		
Ruminants	1	0.25		
Other animals	3	0.75		
5. Evidence of rabies in biting animal :				
Category A	91	22.8	1	1.1
" B	36	9		
" C	22	5.6		
" D	48	12.2	2	4.1
6. Depth of lesion :				
Deep	77	16.9	2	2.5
Superficial	310	79.1	1	0.32
No visible lesion	12	4		
7. Interposition of cloth- ing :				
On bare skin	316	79	3	0.95
Through clothing	83	21		
8. Position of bite :				
Head	26	6.5	1	3.6
Arm	231	54.1	1	0.46
Trunk	10	0.25		
Leg	132	39.15	1	0.76

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
9. Number of days after bite when treatment was begun :				
0 — 4	235	58.9	3	1.3
5 — 7	111	27.8		
8 — 14	42	10.5		
15 — 21	8	2		
22 — 35	3	0.8		

11. The district health officer is entrusted with the observation of the treated cases for a period of one year and he must communicate the result of his observations.

12. One rather severe case of *post-vaccinal paralysis* has been observed, but the person recovered.

On October 10th, O. F., Reg. No. 46004, of Warsaw, carpenter, 33 years of age, was bitten on the thumb of the right hand by a dog suspected of rabies, Category C. Four wounds. Treatment was begun on October 12th, and should have lasted 20 days, that is to say, till October 31st. At the beginning of the treatment the patient complained of weakness and general depression which he thought were due to the injections. On October 27th, after 14 injections, he interrupted the treatment as his legs felt weak and he experienced difficulty in micturition and defæcation, but no fever or vomiting however.

At the neurological clinic, complete paralysis was observed with retention of fæces. A catheter was passed and the patient grew rapidly and steadily better. As from November 26th, the paralytic symptoms disappeared and the eschars healed up. On December 10th, the patient left his bed for the first time.

He stated that he suffered neither from syphilis, alcoholism, nor malaria.

13. Information regarding fatal cases of rabies .
See following table.

Number of cases	Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
1	dried cords	Ordinary	20 days	white	Dog	D	deep	bare skin	head	2 days	32 days		
2	"	"	20 "	"	"	A	superf.	"	arm	3 "	102 "		
3	"	"	20 "	"	"	D	deep	"	leg	2 "	78 "		

Annex XVIIIbis.

POLAND.

PATIENTS TREATED OUTSIDE
THE STATE HYGIENIC INSTITUTE, WARSAW.¹

1927.

1. Method of treatment : Carbolised vaccine prepared at the Institute (*Cf.* document C. H. 487 (*d*)).
 - (a) In all cases : 20 doses 2 cc. daily of an emulsion containing 5 gr. of fresh myelo-encephalic substance in 100 cc.
 - (b) Carbolised vaccine is considered efficient for a period of 6 months.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	1,477		1	0.06
3. Classification according to races :				
White	1,477		1	0.06
4. Classification according to variety of biting animal :				
Dog	1,369	92.8	1	0.07
Cat	92	6		
Solipeds	3	0.2		
Ruminants	9	0.6		
Other animals	4	0.3		
5. Evidence of rabies in biting animal :				
Category A	208	14		
" B	181	12		
" C	786	54	1	0.12
" D	302	20		
6. Depth of lesion :				
Deep	177	12	1	0.67
Superficial	867	58		
No visible lesion	453	30		

¹ Our Institute has delivered vaccine for 4,985 persons, but 3,508 formularies have not been returned.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
7. Interposition of clothing :				
On bare skin	1,119	76	1	0.09
Through clothing	358	24		
8. Position of bite :				
Head	77	5.2		
Arm	838	56	1	0.12
Trunk	29	2		
Leg	533	36.8		
9. Number of days after bite when treatment was begun :				
0 — 4	827	56	1	0.12
5 — 7	435	30		
8 — 14	69	10.5		
15 — 21	40	3		
22 — 35	6	0.5		

11. The district health officer is entrusted with the observation of the treated cases for a period of one year and he must communicate the result of his observations.
12. No paralytic accident has been observed during the year among the 1,477 persons vaccinated with carbolised vaccine.
13. Information regarding a fatal case of rabies :
See following table.

Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
Carbo-lised vaccine	Ordinary	20 days	white	dog	C	deep	bare skin	arm	3 days	36 days		

Annex XVIII.

POLAND.

PASTEUR INSTITUTE, VILNA.

1927.

1. Method of treatment: Calmette's method. The cords are dried during 2 to 8 days and preserved in glycerine with addition of distilled water in the proportion of about 50 per cent.

(a) Schemes of dosage for :

Light cases : Once daily : 2 cc. 8, 7, 6, 5, 4, 3, 6, 5, 4, 3, 6, 5, 4, 3.

Medium cases : 8, 7, 6, 5, 4, 3, 6, 5, 4, 3, 6, 5, 4, 3, 2; or : 8, 7, 6, 5, 4, 3, 6, 5, 4, 3, 2, 6, 5, 4, 3, 2.

Severe cases : 8, 7, 6, 5, 4, 3, 6, 5, 4, 3, 2, 6, 5, 4, 3, 2, 5, 4, 3, 2; or : 8, 7, 6, 5, 4, 3, 2, 6, 5, 4, 3, 2, 5, 4, 3, 2, 5, 4, 3, 2.

In the case of wolf bites 3 cc. once or even twice daily are injected.

(b) Cords which have remained at the most 30 days in glycerine, with addition of water, are used for vaccination. Experiments carried out on rabbits have shown that the bulb preserved in glycerine kept its original virulence for 45 days.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	283		4	1.41
3. Classification according to races :				
Indo-Europeans	255	90.1	4	1.57
Semites	28	9.9		
4. Classification according to variety of biting animal :				
Dog	261	92.2		
Cat	3	1.1		
Wolf	14	4.9	4	28.57
Pig	1	0.35		
Human being	4	1.41		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
5. Evidence of rabies in biting animal :				
Category A	35	12.4		
" C	230	81.3	4	1.74
" D	18	6.3		
6. Depth of lesion :				
Deep	149	52.7	4	2.68
Superficial	110	38.9		
No visible lesion	24	8.4		
7. Interposition of clothing :				
On bare skin	207	73.1	4	1.93
Through clothing	76	26.9		
8. Position of bite :				
Head	42	14.8	4	9.52
Arm	184	65		
Trunk	2	0.7		
Leg	55	19.5		
9. Number of days after bite when treatment was begun :				
0 — 4	161	56.89	4	2.48
5 — 7	56	19.78		
8 — 14	48	16.96		
15 — 21	10	3.53		
Over 21 days	8	2.82		

10. (2) Apart from the 283 patients, there are still 23 persons who, for various reasons, did not complete their treatment.

11. After having secured the co-operation of the local authorities, a complete record of the cases treated at the Pasteur Institute was communicated on September 27th, 1928, to the Department of Public Health of the Palatinate, in order to verify the result of the vaccinations. The above statistics of mortality have been established on the basis of the data sent by the Department in January 1929.

12. No paralytic accident has been observed during the year.

13. Information regarding fatal cases of rabies :
See following table.

N ^o of case	Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal' Expt.
13714	Dried cord preserved in glycerine	Method of treatment applied for severe wolf bites	20 days	European	Wolf	C	Deep multiple extended	bare skin	head and arm	1 day	25 days		
13717	„	„	18 „	„	„	C	„	„	head	1 „	21 „		
13718	„	„	20 „	„	„	C	„	„	„	1 „	26 „		
13719	„	„	19 „	„	„	C	„	„	„	1 „	21 „		

Annex XIX.

YUGOSLAVIA.

PASTEUR INSTITUTE, BELGRADE.¹

1927.

1. Method of treatment: Rapid method of Hempt with Remlinger-Alivisatos-Hempt vaccine.

(a) Classification of bites according to severity.

- I. Close contact with the rabid animal.
- II. Superficial excoriation — no bleeding lesion — lesion of epidermis — rabies in the biting animal.
- III. Bleeding lesions through clothing.
- IV. Bleeding lesions on bare parts of the body, especially on arms and legs.
- V. Large and severe lesions on every part of the body, except on head and face.
- VI. Severe lesions on neck, face and head.

N. B. — For lesions V and VI, the number of injections and the quantity of vaccine were doubled during the second half-year.

Vaccine is prepared from three parts of cerebrum and one part of medulla spinalis, in a suspension of 1:75.

SCHEME OF VACCINATION

Groups according to body weight of patient	Up to 10 kilogrammes						From 10 to 20 kilogrammes					
	I	II	III	IV	V	VI	I	II	III	IV	V	VI
Classification according to degree of bites												
Total quantity of vaccinal emulsion	10 cc.	20 cc.	30 cc.	40 cc.	50 cc.	60 cc.	15 cc.	30 cc.	45 cc.	60 cc.	75 cc.	90 cc.
For 1st day . . .	2	2	2	2	2	2	5	5	5	5	5	5
„ 2nd „ . . .	3	3	3	3	3	3	5	5	5	5	5	5
„ 3rd „ . . .	5	5	5	5	5	5	5	10	10	10	10	10
„ 4th „ . . .		10	10	10	10	10		10	10	10	15	20
„ 5th „ . . .			10	10	10	20			15	15	20	20
„ 6th „ . . .				10	20	20				15	20	20
	Revaccination after a month											
Quantity for complete revaccination			10	20	20	20			15	20	30	30

¹ The Institute has opened, in 1927, 2 branches in which 302 patients have been treated. In the cases thus treated in the branches the mortality was 0.3 per cent.

Groups according to body weight of patient	From 20 to 40 kilogrammes						More than 40 kilogrammes					
	I	II	III	IV	V	VI	I	II	III	IV	V	VI
Classification according to degree of bites	20 cc.	40 cc.	60 cc.	80 cc.	100 cc.	120 cc.	25 cc.	50 cc.	75 cc.	100 cc.	125 cc.	150 cc.
For 1st day . . .	5	5	5	5	5	5	5	5	5	5	5	5
„ 2nd „ . . .	5	5	5	5	5	5	10	10	10	10	10	10
„ 3rd „ . . .	10	10	10	10	10	10	10	15	20	20	20	20
„ 4th „ . . .		20	20	20	20	20		20	20	20	20	30
„ 5th „ . . .			20	20	20	40			20	20	30	40
„ 6th „ . . .				20	40	40				25	40	45
	Revaccination after a month											
Quantity for complete revaccination			20	40	40	40			25	40	40	40

(b) The vaccine is maintained 5 days in ether, then 10 days in carbolised glycerine and used for 20 days.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	1,356		3 ¹ (2)	0.22 (0.14)
3. Classification according to races :				
Europeans	1,352	99.21	3 ¹ (2)	0.22 ² (0.14)
Asiatics	4	0.29		
4. Classification according to variety of biting animal :				
Dog	1,213	90.9	3 ¹ (2)	0.24 ² (0.16)
Cat	79	5.84		
Wolf	4	0.29		
Solipeds	1	0.07		
Ruminants	25	1.84		
Other animals	26	1.06		
Human being	8	0.58		
5. Evidence of rabies in biting animal :				
Category A	134	9.9	1	0.74
„ B	57	4.2		
„ C	486	37	2 ¹ (1)	0.41 ² (0.20)
„ D	679	50		

¹ The patient did not attend to complete treatment.

² Percentage of treated cases.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
6. Depth of lesion :				
Deep	36	2.65	3 ¹ (2)	8.3
Superficial	1,156	85.4		5.6
No visible lesion	164	12.2		
7. Interposition of clothing :				
On bare skin	737	58.8	3 ¹ (2)	0.39
Through clothing	599	45.4		
8. Position of bite :				
Head	80	5.8	2	2.5
Arm	372	27.7	1 ¹	0.2
Trunk	227	17		
Leg	677	50		
9. Number of days after bite when treatment was begun :				
0 — 4	1,172	90.9	2	0.16
5 — 7	93	6.9	1	1.07
8 — 14	55	4.06		
15 — 21	36	2.7		

11. A report on the state of health of the treated persons is requested from the local authorities. There were 487 cases thus reported upon in the first half-year and 869 in the second half-year of 1927.

12. No paralytic accident has been observed during the year.

13. Information regarding fatal cases of rabies :
See following table.

¹ The patient did not complete the treatment, having refused to do so.

Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
Remlinger-Alivisatos-Hempt : 4 days in ether, then 20 days in carbolised glycerine	1. Cf. Scheme No. V.	10 days	European	Dog	C	Deep	bare skin	head	3 days	32 days	Negri+	General paralysis
	2. Cf. Scheme No. V.	8 "	"	"	A	"	"	"	7 "	44 "	"	"
	3. Cf. Scheme No. IV.	7 "	"	"	C	"	"	arm	8 "	180 "	"	under observation

Annex XX.

YUGOSLAVIA.

INSTITUTE OF HYGIENE, NISH.

1926.

1. Method of treatment : Högyes-Alivisatos.

(a) Light cases : 40-100 cc.

Medium cases : 100-200 cc.

Severe cases : 200-350 cc.

(b) Vaccine is used on the day of its preparation.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	1,526		3	0.19
3. Classification according to races :				
Europeans	1,526	100	3	0.19
4. Classification according to variety of biting animal :				
Dog	1,407	92.4		
Cat	61	4		
Wolf	7	0.46	3	42.85
Ruminants	32	2.1		
Other animals	22	1.45		
Human being	8	0.53		
5. Evidence of rabies in biting animal :				
Category A	412	27		
" B	623	40	3	0.48
" C	371	24		
" D	120	9		
6. Depth of lesion :				
Deep	518	39.8		
Superficial	925	60.6	3	0.19
No visible lesion	83	5.4		
7. Interposition of clothing :				
On bare skin	552	36.1	3	0.53
Through clothing	974	63.4		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
8. Position of bite :				
Head	102	6.6	3	2.9
Arm	697	45.5		
Trunk	38	2.5		
Leg	704	45.4		
9. Number of days after bite when treatment was begun :				
0 — 4	912	60.4		
5 — 7	471	31.7		
8 — 14	82	5	3	3.6
15 — 21	61	4		

11. A report on the state of health of the treated persons is requested from the local authorities.
12. No paralytic accident has been observed during the year.
13. Information regarding fatal cases of rabies :
See following table.

Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
Combination of Högyes dilution and Alivisatos ether method	Starting with small dose of ether vaccine 10 cc.	7-10 days	European	Wolf	C	Superficial	bare skin	head	12 days	19 days		

Annex XXI.

YUGOSLAVIA.

PASTEUR INSTITUTE, SARAJEVO.

1926.

1. Method of treatment: Eterna method.

(a) Brain and spinal cord in dilution of 1:75. Injections are given every day.

	I Contact, no visible lesion	II Scratch	III Light cases on trunk	IV Bites on head and severe cases on trunk
1st day	10	20	20	50
2nd „	10	20	30	50
3rd „	10	20	40	50
4th „	10	20	20	50
5th „	20	20	30	50
6th „	—	40	40	50

After 30 days the treatment is repeated.

1st day	20	20
2nd „	40	40

(b) Brain and spinal cord are kept in ether during 96 hours, after which they can be used, or preserved in glycerine during 12 days at most. Vaccine is prepared with pure physiological solution.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	575	100	2	0.35
3. Classification according to races:				
Europeans	575	100	2	0.35
4. Classification according to variety of biting animal:				
Dog	481	83.6	2	0.42
Cat	24	4.1		
Wolf	3	0.5		
Ruminants	25	4.2		
Other animals	42	7.6		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
5. Evidence of rabies in biting animal :				
Category A	156	27.2		
" B	56	9.7	1	1.80
" C	303	52.7	1	0.33
" D	60	10.4		
6. Depth of lesion :				
Deep	60	10.4	2	3.33
Superficial	391	68		
No visible lesion	124	21.6		
7. Interposition of clothing :				
On bare skin	375	65.2		
Through clothing	124	34.8		
8. Position of bite :				
Head	33	5.7		
Arm	314	54.6	2	0.63
Trunk	15	2.6		
Leg	213	37.1		
9. Number of days after bite when treatment was begun :				
0 — 4	331	57.8	2	0.60
5 — 7	127	22		
8 — 14	67	11.6		
15 — 21	14	2.4		
Over 21 days	36	6.2		

11. Patients remained under observation for a year. Health reports have been received :

- (a) Twice for 540 patients (after 6 months and one year);
- (b) Once for 24 patients (after 6 months only). We have not received any health report for 11 treated persons; we have no news from 12 others, and we are still expecting reports for 23 patients.

12. No paralytic accident has been observed during the year.

13. Information regarding fatal cases of rabies.

On account of the deaths, it was decided to apply a stronger treatment in the future. See following table :

Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
Eterna	III	6 days	Europeans	Dog	C	deep	bare skin	arm	1 day	37 days	clinical exam.	
"	III	6 "	"	"	B	"	"	"	"	31 "	"	

Annex XXIbis.

YUGOSLAVIA.

PASTEUR INSTITUTE, SARAJEVO.

1927.

1. Method of treatment: Eterna: Brain and spinal cord in dilution of 1:60.

For (a) and (b), Cf. annex XXI.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	796	100	3	0.37
3. Classification according to races:				
Europeans	796	100	3	0.37
4. Classification according to variety of biting animal:				
Dog	653	82	2	0.30
Cat	70	8.7		
Wolf	23	3.5	1	4.34
Ruminants	23	3		
Other animals	27	3.3		
5. Evidence of rabies in biting animal:				
Category A	145	18.2		
" B	74	9.3		
" C	446	56	3	0.67
" D	129	10.2		
" E	2	0.3		
6. Depth of lesion:				
Deep	48	6	3	6.12
Superficial	673	84.5		
No visible lesion	75	9.5		
7. Interposition of clothing:				
On bare skin	528	66.3	3	0.57
Through clothing	268	33.7		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
8. Position of bite :				
Head	58	7.3	2	3.45
Arm	341	42.8	1	0.29
Trunk	33	4.1		
Leg	364	45.8		
9. Number of days after bite when treatment was begun :				
0 — 4	501	62.9	3	0.60
5 — 7	133	16.8		
8 — 14	111	14		
15 — 21	26	3.2		
Over 21 days	25	3.1		

11. We received up to June 19th, 1926, two reports for 148 patients (after 6 months and a year), one report for 335 patients (after 6 months) and no reports for 313 patients.
12. No paralytic accident has been observed during the year.
13. Information regarding fatal cases of rabies.
See following table :

Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
Eterna	IV	6 days	European	Wolf	C	deep	bare skin	head	2 days	22 days	Clinically rabies	
„	III	6 „	„	Dog	C	4 deep bites	„	arm	1 day	39 „	Negri + (paralysis)	
„	III	6 „	„	„	C	deep	„	head	1 „	31 „	Clinically rabies	

Annex XXII.

YUGOSLAVIA.

PASTEUR DEPARTMENT INSTITUTE OF HYGIENE, ZAGREB.

1926.

1. Method of Treatment :

Ether Alivisatos' method. Cerebrum and cerebellum kept 72 hours in ether. The grey substance of the cerebrum, cerebellum and Cornua Ammonis is used in emulsion with physiological solution at 1:75.

(a) Scheme of dosage :

Light cases : 1 gramme of substance injected during a period of 4-5 days.

Medium cases : 1.5 gramme of substance injected during a period of 6-7 days.

Severe cases : 2 grammes of substance injected during a period of 7-8 days.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	737		1	0.13
3. Classification according to races :				
Europeans	737		1	0.13
4. Classification according to variety of biting animal:				
Dog	630	85.5	1	0.16
Cat	76	10.44		
Pig	3	0.4		
Fox	1	0.1		
Solipeds	3	0.4		
Ruminants	12	1.6		
Porpoise	1	0.1		
Man	11	1.5		
5. Evidence of rabies in biting animal :				
Category A	201	27.4		
" B	311	42.2		
" C	211	28.6	1	0.47
" D	14	1.9		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
6. Depth of lesion :				
Deep	194	26.32	1	0.52
Superficial	489	66.35		
No visible lesion	54	7.32		
7. Interposition of clothing :				
On bare skin	449	60.92	1	0.22
Through clothing	288	39.07		
8. Position of bite :				
Head	40	5.43		
Arm	373	50.61	1	0.27
Trunk	26	3.53		
Leg	298	40.44		
9. Number of days after bite when treatment was begun :				
0 — 4	479	64.99		
5 — 7	133	18.04	1	0.75
8 — 14	66	8.96		
15 — 21	59	8.01		

Remark: Seven persons showing the first symptoms of rabies, but of which none had received preventive treatment, were brought to the Institute during 1926. These persons had all been bitten by dogs, one of them by his own dog, two by dogs of unknown proprietors and 4 by stray dogs.

The shortest incubation period of the above-mentioned cases was 33 days, and the longest 4 months.

Annex XXIII.

PALESTINE.

PASTEUR INSTITUTE, JERUSALEM¹.

1927.

1. Method of treatment: Carbolised virus (killed) suspension 1 per cent.

(a) For all cases: dose of 5 cc. daily during 14 days.

(b) The vaccine is considered to be efficient for 3 months.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	788			
4. Classification according to variety of biting animal:				
Dog	541	68.7		
Cat	167	21.2		
Jackal	4	0.5		
Solipeds	20	2.5		
Ruminants	11	1.4		
Other animals	45	5.7		
5. Evidence of rabies in biting animal:				
Category A	45	5.7		
" B	30	3.8		
" C	340	48.2		
" D	311	39.4		
Unknown	62	7.8		
6. Depth of lesion:				
Deep	168	21.3		
Superficial	619	78.6		
No visible lesion	1	0.1		
7. Interposition of clothing:				
On bare skin	477	60.6		
Through clothing	310	39.4		

¹ The treatment with carbolised killed vaccine is applied in 10 centres. — Decentralisation is therefore complete.

	Number of cases	Percentage of total	Number of fatal cases	Percentage of mortality
8. Position of bite :				
Head	31	3.9		
Arm	282	35.8		
Trunk	20	2.5		
Leg	455	57.8		
9. Number of days after bite when treatment was begun :				
0 — 4	695	88.2		
5 — 7	56	7.1		
8 — 14	22	2.8		
15 — 21	15	1.9		

11. Though the normal period of observation in Palestine is of 3 months, cases remain, so to speak, under permanent observation.
12. No paralytic accident has been observed during the year.
14. No fatal case of rabies

Annex XXIV.

BRITISH INDIA.

HAFKINE INSTITUTE, ANTI-RABIES DEPARTMENT, BOMBAY.

1927.

1. Method of treatment: Carbolised vaccine (1 per cent suspension of fixed virus, brain and spinal cord in 0.5 per cent carbolised saline) (Cf. document C. H. 487 (e)).
 - (a) Schemes of dosage: No change in doses (5 cc. injected subcutaneously for a period of 14 days).
 - (b) Carbolic acid is used as preservative. Vaccine is considered potent for a period of 3 months from the date of manufacture if kept on ice or in cold storage.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	729		5	0.68
3. Classification according to races:				
Europeans	51	6.99		
Natives	678	93	5	0.73
4. Classification according to variety of biting animal:				
Dog	690	94.6	4	0.58
Cat	12	1.6		
Horse	2	0.27		
Jackal	15	2.05		
Human being	1	0.13		
Monkey	7	0.96		
Hyena	2	0.27	1	50
5. Evidence of rabies in biting animal:				
Category A	82	11.2	1	1.22
" B	13	1.8		
" C	634	87	4	0.63
6. Depth of lesion:				
Deep	521	71.4	5	0.95
Superficial	167	22.9		
No visible lesion	41	5.6		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
7. Interposition of clothing :				
On bare skin	590	80.9	5	0.84
Through clothing	139	19		
8. Position of bite :				
Head	54	7.4		
Arm	176	24.1	3	1.70
Trunk	20	2.7		
Leg	479	65.7	2	0.41
9. Number of days after bite when treatment was begun :				
0 — 4	534	73.2	3	0.56
5 — 7	107	14.6	1	0.93
8 — 14	56	7.6		
15 — 21	32	4.6	1	3.10

11. A postcard is given to the patient on the day of completion of treatment with a request that it should be posted after three months stating therein the patient's general health. If the postcard is not received after three months, a reminder with another postcard is sent to the patient, to obtain the information about his health. In future it has been decided to collect the health statistics of the treated cases six months after treatment, and not after three months as has been done hitherto.

12. No paralytic accident has been observed after treatment in this Institute.

13. Information regarding fatal cases of rabies :
See following table :

	Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Inter-vention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.	
1.	Carbolised vaccine 1 per cent suspension of fixed virus brain and spinal cord in 0.5 per cent carbolised saline.	5 cc. daily for 14 days.	14 days	Indian	Dog	C	deep	bare	arm	same day	21 days			
2.			14 "	"	"	A	"	"	"	"	88 "			
3.			14 "	"	"	"	C	"	"	leg	4 days	43 "		
4.			14 "	"	"	"	C	"	"	arm	1 day	30 "		
5.			14 "	"	"	Hyena	C	"	"	leg	28 days	90 "		

Annex XXIVbis.

BRITISH INDIA.

PATIENTS TREATED OUTSIDE THE HAFKINE INSTITUTE, BOMBAY.

1927 (January 1st to December 31st).

1. Method of treatment: Cf. annex XXIV.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	4,432		25	0.56
3. Classification according to races :				
Europeans	443	10.8		
Natives	3,989	90.0	25	0.61
4. Classification according to variety of biting animal :				
Dog	4,070	91.8	15	0.36
Cat	23	0.5		
Wolf	15	0.3	5	33.30
Jackal	281	6.3	5	1.70
Ruminants	43	1		
5. Evidence of rabies in biting animal :				
Category A	70	1.5		
" B	181	4.1		
" C	4,181	94.3	25	0.59
6. Depth of lesion :				
Deep	2,220	30.1	22	0.99
Superficial	1,989	44.9	3	0.14
No visible lesion	223			
7. Interposition of clothing :				
On bare skin	2,719	61.3	21	0.77
Through clothing	1,713	38.6	4	0.23
8. Position of bite :				
Head	228	5.1	10	4.30
Arm	1,276	28.8	7	0.55
Trunk	258	5.8		
Leg	2,670	60.2	8	0.30

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
9. Number of days after bite when treatment was begun :				
0 — 4	2,862	64.6	9	0.31
5 — 7	735	16.6	6	0.81
8 — 14	527	11.9	1	0.19
15 — 21	308	6.9	9	2.90

13. Information regarding fatal cases of rabies :
See following table :

	Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.	
1	Carbolised vaccine 1 per cent suspension of fixed virus brain and spinal cord in 0.5 per cent carbolised saline.	5 cc. daily during 14 days	1 day	Hindu	Dog	C	Superf.	Bare skin	Wrist	45 days	45 days			
2			14 days	"	Jackal	C	Deep		Head and Arm	4 "	49 "			
3			14 "	"	Wolf	C	"	"	Leg	25 "	71 "			
4			1 day	"	Dog	C	"	"	Arm	25 "	26 "			
5			18 days	Moh.	"	"	C	"	"	"	7 "	40 "		
6			14 "	"	"	"	C	"	"	Leg		(died on 2/9/27; no other information is available)		
7			14 "	Hindu	"	"	C	"	"	"	7 days	45 days		
8			14 "	"	"	"	C	"	"	Arm	7 "	47 "		
9			5 "	"	"	"	C	"	"	Leg	8 "	13 "		
10			14 "	"	"	"	C	Superf.	"	Face	8 "	38 "		
11			14 "	"	Jackal	"	C	"	"	"	4 "	24 "		
12			14 "	Moh.	Dog	"	C	Deep	"	"	4 "	22 "		
13			14 "	Hindu	Wolf	"	C	"	"	Leg	1 day	23 "		

14	14	”	”	Jackal	C	”	”	”	same day	123	”
15	14	”	”	”	C	”	”	”	”	105	”
16	11	”	”	Dog	C	”	”	Face	13 days	23	”
17	14	”	Moh.	”	C	”	”	”	2	24	”
18	14	”	Hindu	”	C	”	”	Arm	8	44	”
19	14	”	Moh.	Wolf	C	”	”	Face	7	21	”
20	14	”	Hindu	”	C	”	”	”	30	”	”
21	14	”	”	”	C	”	”	”	30	”	”
22	14	”	”	Dog	C	”	”	Arm	5	12	”
23	17	”	”	”	C	”	”	Leg	3	60	”
24	14	”	”	Fox	C	”	”	Arm	2	28	”
25	14	”	”	Dog	C	”	”	Face	7	22	”

Annex XXV.

BRITISH INDIA.

PASTEUR INSTITUTE, CALCUTTA.

1927.

1. Method of treatment : (Cf. document C. H. 487 (e)).
 - (a) Schemes of dosage for all cases : 5 cc. of a 1 per cent carbolised emulsion of fixed virus, brain and spinal cord for 14 days.
 - (b) Vaccine is not used before one month after manufacture, and is considered to be efficient 3 months longer, in cold storage.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	6,475		61	0.94
3. Classification according to races :				
Europeans	233	3.6		
Hindus	4,721	72.9	47	0.99
Mohammedans	1,435	22.2	12	0.88
Other castes	86	1.3	2	2.33
4. Classification according to variety of biting animal :				
Dog	4,857	75	38	0.78
Cat	32	0.5		
Wolf	4	0.07		
Jackal	1,523	23.5	23	1.51
Solipeds	9	0.14		
Ruminants	7	0.11		
Other animals	43	0.68		
5. Evidence of rabies in biting animal :				
Category A	169	2.6	1	0.59
,, B	124	2.0		
,, C	6,182	95.4	60	0.97
6. Depth of lesion :				
Deep	4,623	71.4	58	1.26
Superficial	1,698	26.2	3	0.18
No visible lesion	154	2.4		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
7. Interposition of clothing :				
On bare skin	5,643	87.1	57	1.01
Through clothing	832	12.9	4	0.48
8. Position of bite :				
Head	356	5.5	18	5.06
Arm	1,691	26.1	22	1.30
Trunk	191	2.9	3	1.56
Leg	4,237	65.5	18	0.42
9. Number of days after bite when treatment was begun :				
0 — 3	1,480	22.8	8	0.54
4 — 7	2,568	39.7	27	1.05
8 — 14	1,576	24.3	18	1.14
15 — 21	465	7.2	4	0.86
Over 21 days	386	6	4	1.04

10. The above percentage mortality means percentage of *total* mortality.

Died during treatment	7	} 61
Died within 15 days of completion	23	
Died more than 15 days after	31	

11. The after histories have been followed up six months after completion of treatment.

12. No paralytic accidents were noted during the year.

13. Information regarding fatal cases of rabies :
See following table :

Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
Carbolised vaccine (Semple's method).	5 cc. of 1 per cent emulsion of fixed rabies virus for 14 days.	12 days	M	Dog	C	Deep	Bare skin	Face	5 days	18 days		
		13 "	H	Jackal	C	"	"	"	8 "	23 "		
		4 "	H	"	C	"	"	"	17 "	22 "		
		1 day	H	Dog	C	"	"	Leg	60 "	62 "		
		11 days	H	"	C	"	"	"	5 "	17 "		
		13 "	H	Jackal	C	"	"	Face	5 "	19 "		
		13 "	M	"	C	"	"	"	5 "	19 "		
		14 "	H	Dog	C	"	"	"	5 "	25 "		
		14 "	H	"	C	"	"	"	8 "	24 "		
		14 "	H	"	C	"	"	"	6 "	21 "		
		14 "	H	Jackal	C	"	"	"	3 "	27 "		
		14 "	H	Dog	C	"	"	"	1 day	22 "		
		14 "	M	"	C	"	"	Arm	5 days	27 "		
		14 "	H	Jackal	C	"	"	Face	4 "	25 "		
		14 "	M	Dog	C	"	"	"	6 "	29 "		
		14 "	M	Jackal	C	"	"	Leg	5 "	24 "		
		14 "	H	Dog	C	"	"	Arm	5 "	21 "		
		14 "	M	Jackal	C	"	"	Face	3 "	30 "		
		14 "	M	Dog	C	"	"	Arm	8 "	34 "		
		14 "	H	"	C	"	"	Trunk	8 "	29 "		
14 "	H	"	C	"	"	Leg	10 "	34 "				

14	"	H	"	C	"	"	Arm	4	"	22	"
14	"	M	Jackal	C	Superficial	"	Trunk	24	"	53	"
14	"	H	Dog	C	Deep	"	Arm	13	"	41	"
14	"	H	Jackal	C	"	"	"	7	"	34	"
14	"	O C	"	C	"	"	Face	3	"	24	"
14	"	H	"	C	"	"	Leg	46	"	72	"
14	"	H	Dog	C	"	"	Arm	8	"	28	"
14	"	M	Jackal	C	"	"	Face	3	"	21	"
14	"	H	"	C	"	"	"	5	"	26	"
14	"	H	Dog	C	"	"	Arm	5	"	40	"
14	"	H	"	C	Superficial	Through clothing	Leg	10	"	54	"
14	"	H	"	C	Deep	Bare skin	"	4	"	124	"
14	"	O C	"	C	"	"	"	9	"	44	"
14	"	H	"	C	"	"	"	15	"	47	"
14	"	H	"	C	"	"	Face	4	"	37	"
14	"	H	"	C	"	"	Leg	5	"	37	"
14	"	H	Jackal	C	"	"	"	9	"	120	"
14	"	H	"	C	"	"	Arm	4	"	40	"
14	"	H	Dog	C	"	"	"	4	"	229	"
14	"	H	"	C	"	"	Leg	8	"	156	"
14	"	H	"	C	"	"	Arm	8	"	39	"
14	"	H	"	C	"	"	"	1 day	"	57	"
14	"	H	"	C	"	"	"	4	"	43	"
14	"	H	"	C	Superficial	Through clothing	"	22	"	275	"

Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.	
Carbolised vaccine (Semple's method).	5 cc. of 1 per cent emulsion of fixed rabies virus for 14 days.	14 days	H	Dog	C	Deep	Bare skin	Arm	1 day	86 days			
		"	M	Jackal	C	"	"	Leg	6 days	62	"		
		"	H	Dog	C	"	"	Arm	10 "	73	"		
		"	H	"	C	"	"	Leg	9 "	37	"		
		"	H	"	A	"	"	"	4 "	109	"		
		"	H	"	C	"	"	Through clothing	"	15 "	89	"	
		"	H	Jackal	C	"	"	Bare skin	Arm	5 "	80	"	
		"	H	"	C	"	"	"	"	5 "	79	"	
		"	M	Dog	C	"	"	Through clothing	Leg	17 "	156	"	
		"	H	Jackal	C	"	"	Bare skin	Face	9 "	54	"	
		"	H	"	C	"	"	"	Arm	9 "	64	"	
		"	M	"	C	"	"	"	"	3 "	81	"	
		"	H	"	C	"	"	"	"	5 "	221	"	
		"	H	Dog	C	"	"	"	Leg	6 "	174	"	
"	H	"	C	"	"	"	Arm	8 "	42	"			
"	H	"	C	"	"	"	Trunk	10 "	78	"			

Annex XXVI.

BRITISH INDIA.

KING EDWARD VII MEMORIAL PASTEUR INSTITUTE, SHILLONG, ASSAM.

1927.

1. Method of treatment : Semple's carbolised vaccine (Cf. document C. H. 487 (e)).
 - (a) Schemes of dosage : All cases : 14 daily doses of 5 cc. each of 1 per cent emulsion of fixed virus in 0.5 per cent carbolic acid.
 - (b) 0.5 per cent carbolic acid is used as preservative. The vaccine is considered to be efficient for four months.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients (including 4 cases who died during treatment)	1,146		15	1.3
3. Classification according to races :				
Europeans	42	3.6		
Indians	1,104	96.3	15	1.3
4. Classification according to variety of biting animal :				
Dog	967	84.4	13	1.35
Cat	19	1.7		
Jackal	131	11.4	2	1.53
Other animals	29	2.5		
5. Evidence of rabies in biting animal :				
Category A	35	3.05		
" B	17	1.5		
" C }	1,094	95.5	15	1.5
" D }				
6. Depth of lesion :				
Deep	634	55.3	15	2.4
Superficial	512	44.6		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
7. Interposition of clothing :				
On bare skin	1,102	96.2	15	1.4
Through clothing	44	3.8		
8. Position of bite :				
Head	72	6.2	1	1.3
Arm	301	26.3	1	0.3
Trunk	93	8.1		
Leg	680	59.3	9	1.3
9. Number of days after bite when treatment was begun :				
0 — 4	341	29.8	1	0.2
5 — 7	400	34.9	3	0.7
8 — 14	320	27.9	6	1.9
15 — 21	54	4.7	1	1.9
Over 21 days	31	2.7		

11. Patients were asked to report after 3 months : 305 reported after 3 months, 303 after 4 months, 341 after 5 months and 161 after from 6 to 13 months. From 32 cases (2.9 per cent) no report was received. Cases not reporting after 3 months were followed up through Government district officers.

13. Information regarding fatal cases of rabies :
See following table :

Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
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Cases which developed hydrophobia during treatment

Semple's carbolised vaccine		9 days	Indian	Dog	C	deep	bare skin	Leg	24 days	33 days		
		6 "	"	"	C	"	"	"	88 "	94 "		
		7 "	"	"	C	"	"	"	20 "	28 "		
		6 "	"	Jackal	C	"	"	Face	13 "	20 "		

Cases which developed hydrophobia after completing treatment

5 cc. of 1 per cent emulsion of fixed virus in 0.5 per cent carbolic daily	14 days	Indian	Dog	C	deep	bare skin	Arm	6 days	30 days		
	14 "	"	"	C	"	"	Trunk and leg	6 "	28 "		
	14 "	"	"	C	"	"	"	10 "	38 "		
	14 "	"	Jackal	C	"	"	Leg	5 "	25 "		
	14 "	"	Dog	C	"	"	"	3 "	31 "		
	14 "	"	"	C	"	"	"	10 "	119 "		
	14 "	"	"	C	"	"	Head	8 "	52 "		
	14 "	"	"	C	"	"	and leg				
	14 "	"	"	C	"	"	Leg	9 "	60 "		
	14 "	"	"	C	"	"	"	9 "	66 "		
	14 "	"	"	C	"	"	"	19 "	156 "		
	14 "	"	"	C	"	"	"	12 "	56 "		

Category C : Neither certified nor proved rabid, nothing being known about the animal.

Annex XXVII.

CEYLON.

PASTEUR INSTITUTE, COLOMBO.

1927.

1. Method of treatment :

- (a) Schemes of dosage : Adults : 5 cc. of 1 per cent emulsion of rabid brain in 1/2 per cent carbolic acid daily for 14 to 20 days.
- (b) The vaccine is considered to be efficient up to 2 months : depends on cold storage conditions.

	Number of cases	Percentage of total	Number of fatal cases ¹	Percentage mortality
2. Statistics for all patients	1,083		6	0.55
3. Classification according to races :				
Sinhalese	617	57	3	0.5
Tamil	249	23	3	1.2
Burgers	100	9.2		
Europeans	79	7.3		
Malays, etc.	38	3.5		
4. Classification according to variety of biting animal :				
Dog	1,017	94	6	0.6
Cat	6	0.55		
Rat	1	0.09		
Jackal	9	0.85		
Persons with hydrophobia	42	3.95		
Ruminants	7	0.64		
Monkey	1	0.09		
5. Evidence of rabies in biting animal :				
Category A Negri positive or animal inoculat. positive	149	14	2	1.3
" B clinically positive	75	7		
" C uncertain . . .	832	76	4	0.48
" D presumably negative (<i>i. e.</i> , animal alive 10 days after biting)	27	3		

¹ Not including those marked thus under 13, " Table of fatal cases ".

	Number of cases	Percentage of total	Number of fatal cases 1	Percentage mortality
6. Depth of lesion :				
Deep	171	16	3	1.75
Superficial	589	54	3	0.5
No visible lesion	323	30		
7. Interposition of clothing :				
On bare skin	676	62	6	0.89
Through clothing	84	8		
8. Position of bite :				
Head	24	3.2	1	4
Arm	317	41.7	3	0.94
Trunk	36	4.7	1	3
Leg	383	50.4	1	0.26
9. Number of days after bite when treatment was begun :				
0 — 4	610	56	6	0.98
5 — 7	207	19		
8 — 14	184	17		
15 — 21	27	2.5		
Over 21 days	55	5	2	3.6
11. Enquiries are sent out every 3 months for a year to patients or to some responsible person when the patients are illiterate.				
12. No paralytic accident was observed during the year.				
13. Information regarding each fatal case of rabies : See following table :				

¹ Not including those marked thus under 13, " Table of fatal cases ".

No.	Sex	Age	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
1	M	75	—	7 days	Sinhalese	Dog	C	deep	bare skin	Wrist	28 days	35 days ²		
2	M	12	medium	14 "	"	"	C	superficial	"	Arm	1 day	26 "		
3	M	7	"	14 "	"	"	A	deep	"	Cheek	1 "	35 "		
4	M	55	—	3 "	"	"	C	superficial	"	Thumb	42 days	47 "	²	
5	F	3	medium	14 "	Tamil	"	C	"	"	Back	4 "	40 "		
6	M	27	"	14 "	Sinhalese	"	A	deep	"	Foot	1 day	40 "		
7	F	18	"	13 (abs. 1 day)	Tamil	"	C	superficial	"	Hand	3 days	44 "		
8	M	10	"	14 days	Sinhalese	"	C	deep	"	Leg	4 "	25 "	^{2 3}	
9 ¹	F	55	"	14 "	Tamil	"	C	"	"	Hand	1 day		⁴	

¹ Not shown last year.

² See footnote p. 121.

³ Diagnosis of rabies as cause of death probably incorrect. No history of this patient could be obtained, except that he died suddenly 25 days after the bite. The brain of the dog which bit him was negative for negri bodies.

⁴ Cannot be elicited with any degree of accuracy.

Annex XXVIIIbis.

CEYLON.

PASTEUR INSTITUTE, COLOMBO.

1928.

1. Method of treatment :

- (a) Schemes of dosage : For adults : 5 cc. of 1 per cent emulsion of rabid brain in 0,5 per cent carbolic acid daily for 14 to 20 days.
- (b) The vaccine is considered to be efficient up to 2 months : depends on cold storage conditions.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	1,448			
3. Classification according to races :				
Sinhalese	822	56.77		
Tamil	390	26.93		
Burgers	120	8.29		
Europeans	60	4.14		
Malays, etc.	56	3.87		
4. Classification according to variety of biting animal :				
Dog	1,402	96.82		
Cat	8	0.56		
Persons with hydrophobia	29	2		
Ruminants	7	0.48		
Monkeys	2	0.14		
5. Evidence of rabies in biting animal :				
Category A ^{Nagri +, or animal inoculation +}	480	33.15		
" B clinically +	420	29		
" C uncertain	437	30.18		
" D ^{presumably negative} _{(i. e., animal being alive 10 days after biting, etc.).}	111	7.67		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
6. Depth of lesion :				
Deep	337	23.27		
Superficial	866	59.81		
No visible lesion (possible infection)	245	16.92		
7. Interposition of clothing :				
On bare skin	993	68.58		
Through clothing	210	14.50		
Possible infection	245	16.92		
8. Position of bite :				
Head	61	4.21		
Arm	502	34.67		
Trunk	42	2.90		
Leg	598	41.30		
Possible infection	245	16.92		
9. Number of days after bite when treatment was begun :				
0 — 4	837	57.80		
5 — 7	321	22.17		
8 — 14	192	13.26		
15 — 21	32	2.35		
Over 21 days	64	4.42		

10. There is a tendency in this country to diagnose every case that exhibits cerebral symptoms (*e.g.*, convulsions in children) as hydrophobia if the person has previously undergone treatment (*vide* case 3 of the "Mortality scheme" where the patient's brain was negative both microscopically and in animal inoculation).

11. Inquiries are sent every 3 months — for a year — to patients or to some responsible person when the patients are illiterate.

12. Abscesses at the site of inoculation observed in three cases when the skin was sterilised with plain rectified spirit. Previously Tr. iodine used. At present an alcoholic solution of 1 per cent corrosive sublimate is used.

13. Information regarding each fatal case of rabies :

No.	Sex	Age	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Animal Expt.
1	M	23	medium	14 days	Tamil	Dog	A	deep	bare skin	Arm	3 days	28 days	Not available
2	M	24	"	14 "	Sinhalese	"	B	"	"	Leg	3 "	? "	"
3	F	6	"	14 "	"	"	A	"	"	Head (cheek)	6 "	31 "	Negri negative; animal inoculation negative
4	M	42	"	14 "	"	"	A	superficial deep	"	Leg	4 "	42 "	Not available
5	F	10	"	14 "	Tamil	"	C	deep	"	Arm	3 "	21 "	"
6	M	40	"	10 " did not complete treatment	Sinhalese	"	C Negrio	superficial	"	"	9 "	35 "	"
7	M	9	moderately severe	16 "	"	"	C	deep	"	Head	6(?) , probably more	26 "	Under examination

Annex XXVIII.

FEDERATED MALAY STATES.

MEDICAL RESEARCH INSTITUTE, KUALA LUMPUR.

1928.

1. Method of treatment : Semple's.

(a) Schemes of dosage :

Light and medium cases : 14 daily injections of 5 cc. in 2 doses ;

Severe cases : 21 daily injections of 5 cc. in 2 doses.

(b) Unused vaccine is discarded when six months old.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	146		1	0.68
3. Classification according to races :				
Europeans	41	28.08		
Eurasians	9	6.16		
Indians	64	43.84		
Malays	6	4.11		
Chinese	26	17.81	1	
4. Classification according to variety of biting animal :				
Dog	92	100		
	Dogs concerned		Persons treated due to dog of category	
5. Evidence of rabies in biting animal :				
Category A	65	70.65	109	74.66
" B	6	6.52	13	8.90
" C	19	20.65	22	15.07
" D	2	2.17	2	1.37

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
6. Depth of lesion :				
Deep	55			
Superficial				
No visible lesion ¹	91			
7. Interposition of clothing :				
On bare skin	27	49.1		
Through clothing	28	50.9	1	3.57
8. Position of bite :				
Head	1	1.82		
Arm	22	40		
Trunk	1	1.82		
Leg	31	56.36	1	3.22
9. Number of days after bite when treatment was begun :				
0 — 4	84	57.54	1	1.19
5 — 7	30	20.55		
8 — 14	19	13.01		
15 — 21	5	3.42		
Over 21 days	8	5.48		

11. A form for the recording of history and treatment and a "follow-up" form (6 months) were kept for every patient receiving treatment at the Institute during 1929. These are being distributed with all vaccine to be used outside the Institute.

12. No paralytic accident has been observed during the year.

13. Information regarding fatal case of rabies.

Chinese male age 16 years — admitted to hospital after 2 days' illness and 72 days after bite, and 55 days after end of treatment. Complaining of fever, headache, giddiness, and general weakness. Could talk. Very thirsty. Heart and lungs normal. Spleen palpable.

Post-mortem report describes : Numerous petechiæ over surface of heart and bases of lungs. Spleen enlarged.

Brains congested and cedematous. Brain sent to this Institute.

Smears and sections failed to demonstrate Negri bodies. All three rabbits inoculated developed symptoms of rabies and sections showed the presence of Negri bodies.

¹ No visible lesion : 91. The figure 91 is the number of those actually bitten with no visible lesion, plus those who came into contact with saliva.

Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
Simple	Standard	14 days	Chinese	Dog	A	?	Through clothing	left leg	3 days	73 days	N. B. not found	3 rabbits all +, with Negri bodies

Annex XXVIIIbis.

FEDERATED MALAY STATES.

PATIENTS TREATED OUTSIDE
THE MEDICAL RESEARCH INSTITUTE, KUALA LUMPUR.

1928.

(Patients treated with vaccine distributed by the Institute).

1. Method of treatment: As at Kuala Lumpur (Semple's)
(Cf. annex XXVIII).

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	52			
3. Classification according to races :				
Chinese	13			
Indians	23			
Malays	9			
Europeans	7			
4. Classification according to variety of biting animal :				
Dog	51			
Cat	1			
5. Evidence of rabies in biting animal :				
Category A	30			
" B	5			
" C	14			
" D	3			
6. Depth of lesion : ¹				
Deep	10			
Superficial	6			
No visible lesion . . .	1			
7. Interposition of cloth- ing : ¹				
On bare skin	10			
Through clothing . . .	7			

¹ One of the sub-stations has not reported these details.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
8. Position of bite : ¹				
Arm	6			
Trunk	2			
Leg	9			
9. Number of days after bite when treatment was begun : ¹				
0 — 4	3			
5 — 7	6			
8 — 14	6			
15 — 21	2			

11. One case only (European) has reported — No ill effects 6 months after treatment.

¹ One of the sub-stations has not reported those details.

Annex XXIX.

SIAM.

PASTEUR INSTITUTE, BANGKOK.

1928.

1. Method of treatment: Pasteur (*Cf.* document C. H. 487h).

(a) 15, 18, 21, 25 days' treatments.

(b) Glycerine is used as a preservative and the vaccine considered efficient for 20 days.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	942		10	1.06
3. Classification according to races :				
Siamese	687	73	8	1.01
Chinese	221	23	2	0.9
Europeans	4	0.45		
Indians	26	2.76		
Japanese	4	0.45		
4. Classification according to variety of biting animal :				
Dog	909	96.5	10	1.01
Cat	3	0.32		
Solipeds	1	0.1		
Ruminants	1	0.1		
Contact with patients' saliva	28	2.97		
5. Evidence of rabies in biting animal :				
Category A	12	1.27		
" B	35	3.72		
" C	867	92.2	10	1.01
" D	28	2.97		
6. Depth of lesion :				
Deep	283	30	9	3.01
Superficial	626	66.5	1	0.1
-No visible lesion	33	3.5		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
7. Interposition of clothing :				
On bare skin	700	74.4	10	1.04
Through clothing	242	25.6		
8. Position of bite :				
Head	60	6.36	1	1.06
Arm	279	29.6	5	1.07
Trunk	52	5.52		
Leg	551	58.6	4	0.7
9. Number of days after bite when treatment was begun :				
0 — 4	641	68	8	1.02
5 — 7	118	12.5	1	0.8
8 — 14	95	10.1	1	1
15 — 21	88	9.35		

11. Steps have been taken to follow up subsequent history after 6 months.

12. Paralytic accidents observed during the year 1928 :

1. S. M., age 19, female, teacher. — Position of the bite : leg. — Treatment began 2 days after bite. — Dorsolumbar myelitis. Symptoms occurred on the eighteenth day of treatment. Cured 15 days after.

2. H. H., age 24, male, official. Position of the bite : leg. Treatment begun 2 days after bite. Slight dorsolumbar myelitis. Symptoms occurred on the fourteenth day of treatment. Cured 7 days later.

3. T., age 29, priest. Position of bite : arm. Treatment begun 4 days after bite. Neuritis form. Trigeminal paralysis. Symptoms occurred on the twelfth day of treatment. Cured 20 days later.

Negative result of the inoculation of the dog's brain to rabbit.

4. K., age 34, male, physician. Position of bite : arm. Dog has been killed. Treatment begun 3 days after bite. Neuritis of the peripheral nerves. Symptoms occurred on the sixteenth day of treatment. Cured a few days after.

13. Information regarding fatal cases of rabies : See following table :

N°	Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Inter-vention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
1	Dried cord	severe	21 days	Chin.	Dog	C	deep	bare	leg	5 days	28 days		
2	"	"	21 "	Siam.	"	C	"	"	"	3 "	36 "		
3	"	"	21 "	"	"	C	"	"	"	1 day	35 "		
4	"	light	15 "	Chin.	"	C	"	"	hand	2 days	50 "		
5	"	severe	20 "	Siam.	"	C	"	"	"	3 "	67 "		
6	"	"	21 "	"	"	C	"	"	"	1 day	40 "		
7	"	"	21 "	"	"	C	superficial	"	"	1 "	28 "		
8	"	"	21 "	"	"	C	deep	"	leg	3 days	67 "		
9	"	"	21 "	"	"	C	"	"	hand	6 "	49 "		
10	"	medium	18 "	"	"	C	"	"	"	9 "	74 "		

Annex XXIXbis.

SIAM.

PATIENTS TREATED OUTSIDE THE PASTEUR INSTITUTE, BANGKOK.

1928.

1. Method of treatment : Pasteur (Cf. annex XXIX).

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	10			
3. Classification according to races :				
Siamese	9			
Chinese	1			
4. Classification according to variety of biting animal :				
Dog	10			
5. Evidence of rabies in biting animal :				
Category C	10			
6. Depth of lesion :				
Deep	2			
Superficial	8			
7. Interposition of clothing :				
On bare skin	7			
Through clothing	3			
8. Position of bite :				
Leg	10			
9. Number of days after bite when treatment was begun :				
8 — 14	6			
15 — 21	4			

Annex XXX.

CHINA.

PASTEUR INSTITUTE OF THE FOREIGN SETTLEMENT, SHANGHAI.

1928.

1. Method of treatment : Pasteur, as modified by Semple. (Cf. document C. H. 487 (d)).

(b) The preservative used here is carbolic acid and 6 months is the period of preservation for which the vaccine is considered to be efficient.

	Number of cases	Percentage of total	Number of fatal cases	Percentage of mortality
2. Statistics for all patients	189		5	2.64
3. Classification according to races :				
Foreigners (chiefly Europeans)	74	39	1	1.35
Chinese	103	55	4	3.88
Other Asiatics	12	6		
4. Classification according to variety of biting animal :				
Dog	172	91	5	2.91
Cat	11			
Human being	6	3		
5. Evidence of rabies in biting animal :				
Category { Proved rabid . . .	52	27	1	1.92
Category { Strongly suspicious of rabies . . .	34	18	4	11.76
Category { No information obtainable . . .	62	33		
Category { Licked cases and non-rabid . . .	41	22		
6. Depth of lesion :				
Deep	15	8	1	6.66
Superficial	138	73	4	2.90
No visible lesion	36	19		

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
7. Interposition of clothing :				
On bare skin	116	62	5	4.31
Through clothing	73	38		
8. Position of bite :				
Head	14	8	3	21.43
Arm	87	46	2	2.30
Trunk	21	11		
Leg	67	35		
9. Number of days after bite when treatment was begun :				
0 — 4	101	54	3	2.99
5 — 7	40	21	2	5
8 — 14	32	17		
15 — 21	16	8		

10. "Licked cases" are treatments given as a precautionary measure. "Non-rabid cases" are cases where the evidence was not procurable or definite until treatment was completed.

One patient, who completed treatment on September 3rd, died on October 20th after 10 days' illness. It is doubtful whether this was actually a case of hydrophobia as the clinical history was more suggestive of pneumococcus meningitis.

Another patient, (3 years old) was noticed during treatment to have a very distended abdomen and enlarged spleen. The child was reported to harbour ascaris and it is possible he had also hookworm disease. There was fever and the child looked feeble. It is dubious whether this child died of hydrophobia.

11. Patients are requested to notify this Institute, 3 months and also 6 months after treatment has been completed, which is only occasionally done.

12. No paralytic accident has been observed during the year.

13. Information regarding each fatal case of rabies :
See following table :

Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post-mortem.
754 44 cc.	Normal	15 days	Europ.	Dog	A	slight	bare skin	Head	1 day	21 days	Microscopical examination of the brain of the biting animal. Negri +
759 42 "	"	14 "	Chinese	"	C	"	"	Arm	3 days	34 "	Animal not received
806 42 "	"	14 "	"	"	C	deep	"	Head	5 "	19 "	
848 45 "	"	15 "	"	"	C	slight	"	Arm	7 "	54 "	
849 45 "	"	15 "	"	"	C	"	"	Head	4 "	65 "	

Annex XXXI.

MOROCCO.

PASTEUR INSTITUTE, TANGIER.

1927.

1. Method of treatment : Dried glycerinated cord.

(a) *Light case* : 4.4, 4.4, 4.4, 4.4, 3.3, 4.4, 3.3, 2.2, 3.3.
Medium cases: 4.4, 4.4, 4.4, 4.4, 3.3, 3.3, 4.4, 3.3, 2.2, 3.3, 3.3, 2.2. *Severe cases* : 4.4.4, 4.4, 4.4.4, 4.4, 3.3.3, 3.3.3, 3.3.3, 2.2.2, 2.2.2, 3.3.3, 3.2.2, 2.2, 2.2, 3.3.3, 3.3, 2.2, 2.2, 3.3, 3.3.3, 4.4.4, 3.3.3, 3.3.3, 2.2, 2.2.2, 3.3.3, 2.2.2, 2.2.2, 4.4.3, 3.2.2.

(b) The cords lose all their potency after 15 days of immersion in glycerine.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
2. Statistics for all patients	13			
3. Classification according to races :				
French	5			
Moroccans	4			
Egyptians	2			
Moroccan Israelites .	2			
4. Classification according to variety of biting animal :				
Dog	9			
Guinea-pig	1			
Laboratory accidents	3			
5. Evidence of rabies in biting animal :				
Category A	2			
" B	3			
" C	5			
Laboratory contamination	3			

N. B. The Tangier Institute only extends its action within the international zone, which explains the small number of cases treated each year. Cases of the French Protectorate are sent to the Rabat Anti-Rabies Institute.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
6. Depth of lesion :				
Deep	6			
Superficial	7			
7. Interposition of clothing :				
On bare skin	13			
8. Position of bite :				
Head	2			
Arm	8			
Leg	3			
9. Number of days after bite when treatment was begun :				
0 — 4	6			
5 — 7	4			
8 — 14	3			

- 11. All the cases treated are known to the Institute. They live in Tangier, and no accident can occur to them without the Institute being informed of it.
- 12. Paralytic accidents have never been observed in the Tangier Institute (617 cases treated since the foundation of the Institute).
- 13. No fatal case of rabies.

ANNEX XXXII.

UNION OF SOVIET SOCIALIST REPUBLICS.

WORK OF THE PASTEUR INSTITUTES IN THE U. S. S. R.

The anti-rabies institutes and local stations operating in 1927 are divided as follows :

	Number of Institutes	Number of Institutes with local anti-rabies stations	Number of local stations	Note
R. S. F. S. R. . . .	51	28	198	
S. S. R. of the Ukraine	11	7	51	The local anti-rabies stations are branches of the Pasteur Institutes, which furnish them with vaccine and prescribe the system by which inoculations are to be carried out.
S. S. R. of White Russia	3	1	27	
Turkoman S. S. R.	1	—	—	
Uzbek S. S. R. . . .	2	1	5	
S. F. S. R. of Transcaucasia	2	1	4	
	70	38	285	

Tables 1, 2 and 3 include the information supplied by 64 Pasteur Institutes and 247 local anti-rabies stations in the Union. They do not include the statistics of 5 Pasteur Institutes (those of Makhatch-Kala, Novouzdensk, Khabarovsk, Frunze, Blagoveschensk and Kharkov) and of 38 local stations under them. The Anti-Rabies Institute of Kharkov did not send its report until the returns given below had been compiled.

In 1927 the Pasteur method was applied in 27 institutes, the Högyes-Phillips in 29, and the Fermi in 14. The vaccine supplied to the local anti-rabies stations is prepared by the Phillips method as modified by Calmette-Krauss. Table I contains, along with the total number of persons inoculated, the number of persons bitten, as some of the persons inoculated against rabies had no visible wounds. In 1927, these made up 33 per cent of the total

number inoculated. The death rate is calculated not only with reference to the total number of persons treated, but with reference to the number of persons certified to have been bitten, since of those persons inoculated who had no visible wounds (persons contaminated with saliva, etc.) not one died.

Special attention is drawn to the fact that paralytic accidents were commonest among inoculated persons who had not been bitten by a rabid animal.

TABLE I.

	Number of persons treated in 1927				Number of deaths in 1927		
	Total	Percentage	Persons bitten	Percentage	Total	Per 100 persons treated	Per 100 persons bitten
Total number of persons who applied to anti-rabies institutes	140,112						
Number of persons treated	111,427	100	74,430	100	176	0.16	0.23
Methods :							
Pasteur	43,289	38.9	28,241	37.9	85	0.20	0.30
Fermi	18,496	16.6	12,232	16.4	29	0.16	0.24
Phillips or Högyes	47,484	42.7	32,435	43.7	53	0.11	0.16
Pasteur-Remlinger	664	0.5	481	0.6	4	0.60	0.83
Pasteur-Fermi	1,494	1.3	1,041	1.4	5	0.33	0.48
Number of completed treatments . .	108,337	100	72,632	100	175	0.16	0.24
Number according to the biting animal :							
Dog	90,657	83.7	64,384	88.7	135	0.15	0.21
Cat	7,888	7.3	5,562	7.7	2	0.03	0.04
Wolf	476	0.4	406	0.6	35	7.35	8.62
Cow and horse	6,461	6	1,341	1.8	—	—	—
Other animals	2,855	2.6	939	1.2	—	—	—
According to categories :							
A	10,286	9.5	5,252	7.2	25	0.24	0.48

B	28,102	25.9	14,834	20.7	25	0.10	0.17
C	69,949	64.6	52,546	72.4	122	0.17	0.23
Bites :							
Single	—	—	38,868	53.5	29	—	0.07
Multiple	—	—	31,721	43.7	141	—	0.44
Not specified	—	—	2,043	2.8	4	—	0.20
Invisible	35,705	33 ²	—	—	—	—	—
On the bare skin	—	—	37,005	50.9	146	—	0.39
Through the clothing	—	—	28,754	39.6	9	—	0.03
Not specified	—	—	6,870	9.5	17	—	0.25
Site of bite:							
Head	—	—	4,847	6.7	98	—	2.02
Arms	—	—	36,661	50.5	65 ³	—	0.18
Legs	—	—	27,128	37.3	6	—	0.02
Other parts of the body	—	—	3,995	5.5	3	—	0.08
Number of days between date of bite and beginning of treatment :							
0—3	42,098	38.9	—	—	90	0.21	—
4—7	35,440	32.7	—	—	51	0.14	—
1st week (no date)	2,728	2.5	—	—	47 ⁴	0.15	—
8th—14th day	20,493	18.9	—	—	11	0.05	—
After 14 days	3,578	7	—	—	9	0.12	—

¹ Including three cases not included in later statistics.

² Sixty-seven per cent of persons treated were bitten.

³ Only persons with visible wounds are included.

⁴ Deaths concerning which there was no information as to site of bite or date of arrival at the anti-rabies institute.

TABLE II.

Death rate in 1927

Method	Biting animal	Category	Site of wound	Wound	Interval between date of bite and beginning of treatment	Period of incubation
1. Pasteur	wolf	A	head	multiple head wounds	6 days	17 d.
2. "	dog	B	"	multiple wounds	2 "	30 "
3. "	"	C	hand	"	2 "	31 "
4. "	"	C	"	"	10 "	30 "
5. "	"	B	"	"	5 "	43 "
6. "	"	C	head	"	4 "	25 "
7. "	"	C	hand	"	5 "	59 "
8. "	"	C	head	"	3 "	74 "
9. "	"	C	"	"	7 "	66 "
10. "	"	C	"	"	4 "	260 "
11. "	"	C	arm	"	3 "	88 "
12. "	wolf	A	hand	"	1 "	26 "
13. "	dog	C	"	"	2 "	95 "
14. "	"	C	trunk	"	2 "	—
15. "	"	C	hand	single wound on bare skin	12 "	25 "
16. "	"	C	"	multiple wounds on bare skin	7 "	16 "
17. "	wolf	A	head	"	33 "	44 "
18. "	dog	C	"	"	6 "	20 "
19. "	"	C	hand	"	2 "	25 "
20. "	"	C	head	"	1 "	35 "
21. "	"	C	shoul- der	"	3 "	30 "
22. "	"	C	head	"	2 "	21 "
23. "	"	C	hand	"	7 "	49 "
24. "	"	C	head	"	2 "	26 "
25. "	"	C	hand	"	6 "	305 "
26. "	"	A	arm	"	5 "	35 "
27. "	dog	A	head	"	3 "	25 "
28. "	cat	A	"	"	3 "	20 "
29. "	dog	C	"	"	3 "	25 "

Method	Biting animal	Category	Site of wound	Wound	Interval between date of bite and beginning of treatment	Period of incubation
30. Pasteur	dog	C	head	single wound on bare skin	3 days	25 d.
31. "	"	C	hand	multiple wounds on bare skin	36 "	34 "
32. "	"	C	genital organ	single bite through the clothing	6 "	34 "
33. "	"	C	head	multiple wounds on bare skin	2 "	19 "
34. "	"	C	"	single wound on bare skin	11 "	42 "
35. "	wolf	C	"	multiple wounds on bare skin	5 "	47 "
36. "	"	C	"	"	3 "	28 "
37. "	"	C	hands	"	3 "	31 "
38. "	"	C	head	"	3 "	22 "
39. "	"	C	neck	"	3 "	25 "
40. "	"	C	head	"	3 "	23 "
41. "	"	C	"	"	3 "	21 "
42. "	dog	C	shoulder	multiple bites through the clothing	3 "	20 "
43. "	"	C	head	single wound on bare skin	3 "	47 "
44. "	"	C	"	multiple wounds on bare skin	6 "	22 "

Method	Biting animal	Category	Site of wound	Wound	Interval between date of bite and beginning of treatment	Period of incubation
45. Pasteur	dog	C	hands	multiple wounds on bare skin	2 days	293 d.
46. „	„	A	head	single wound on bare skin	3 „	30 „
47. „	„	C	„	multiple wounds on bare skin	2 „	35 „
48. „	„	C	„	„	5 „	197 „
49. „	„	C	hand	single wound on bare skin	3 „	19 „
50. „	„	C	head	multiple wounds on bare skin	2 „	19 „
51. „	„	C	„	„	2 „	52 „
52. „	„	C	„	„	3 „	25 „
53. „	„	C	„	„	2 „	30 „
54. „	„	B	„	„	13 „	23 „
55. „	„	B	hand	single wound on bare skin	5 „	78 „
56. „	„	A	„	multiple wounds on bare skin	2 „	68 „
57. „	wolf	B	shoulder	„	2 „	27 „
58. „	„	B	hand	„	2 „	31 „
59. „	dog	C	head	single wound on bare skin	6 „	180 „

Method	Biting animal	Category	Site of wound	Wound	Interval between date of bite and beginning of treatment	Period of incubation
60. Pasteur	dog	B	head	multiple wounds on bare skin	2 days	13 d.
61. "	wolf	B	"	"	7 "	31 "
62. "	"	C	"	"	2 "	28 "
63. "	dog	C	"	single wound on bare skin	2 "	17 "
64. "	"	C	hand	multiple wounds on bare skin	2 "	27 "
65. "	wolf	C	neck	"	2 "	14 "
66. "	dog	C	legs	single wound on bare skin	6 "	86 "
67. "	"	C	shoulder	through clothing	36 "	38 "
68. "	"	C	knee	multiple wounds on bare skin	4 "	71 "
69. "	"	C	hands	"	8 "	31 "
70. "	"	C	"	"	2 "	93 "
71. "	"	C	legs	"	9 "	150 "
72. "	"	C	hands	"	3 "	25 "
73. "	"	C	"	"	2 "	24 "
74. "	"	C	head	"	5 "	30 "
75. "	"	C	shoulder	"	6 "	47 "
76. "	"	B	hand	"	3 "	111 "
77. "	"	C	"	single wound on bare skin	2 "	—
78. "	"	C	head	"	2 "	10 "
79. "	"	A	hand	"	2 "	109 "
80. "	"	C	head	"	2 "	25 "

Method	Biting animal	Category	Site of wound	Wound	Interval between date of bite and beginning of treatment	Period of incubation
81. Pasteur	cat	A	leg	multiple wounds through clothing	3 days	19 d.
82. „	dog	C	head	single wound on bare skin	43 „	48 „

83-85. No history of the disease.

1. Högyes or Phillips	dog	B	hand	multiple wounds on bare skin	5 days	180 d.
2. „	wolf	C	head	„	3 „	28 „
3. „	dog	C	„	„	2 „	45 „
4. „	„	C	„	„	7 „	57 „
5. „	„	C	hand	„	7 „	82 „
6. „	wolf	A	head	„	3 „	24 „
7. „	dog	C	hand	single wound on bare skin	5 „	189 „
8. „	wolf	A	head	multiple wounds on bare skin	—	19 „
9. „	dog	C	„	„	19 „	80 „
10. „	„	C	hands	„	—	90 „
11. „	„	C	„	„	7 „	52 „
12. „	„	C	head	„	7 „	47 „
13. „	„	C	shoul- der	„	—	120 „
14. „	„	C	head	„	—	65 „
15. „	„	B	shoul- der	„	4 „	30 „
16. „	„	C	head	„	2 „	21 „
17. „	„	C	„	„	3 „	30 „
18. „	„	C	hands	„	2 „	210 „
19. „	„	C	„	„	3 „	49 „

Method	Biting animal	Category	Site of wound	Wound	Interval between date of bite and beginning of treatment	Period of incubation
20. Högyes or Phillips	dog	C	shoulder	multiple wounds through clothing	3 days	306 d.
21. "	"	A	hand	multiple wounds on bare skin	3 "	50 "
22. "	"	B	"	"	7 "	32 "
23. "	"	C	"	"	6 "	205 "
24. "	"	C	head	single wound on bare skin	3 "	20 "
25. "	"	C	"	multiple wounds on bare skin	10 "	27 "
26. "	wolf	A	"	"	2 "	444 "
27. "	dog	C	"	"	4 "	30 "
28. "	"	C	"	"	6 "	16 "
29. "	"	C	"	"	7 "	18 "
30. "	"	C	"	"	7 "	26 "
31. "	cat	B	leg	single wound on bare skin	5 "	—
32. "	dog	C	head	"	—	29 "
33. "	"	C	hand	multiple bites on bare skin	3 "	100 "
34. "	"	C	"	"	3 "	39 "
35. "	"	C	feet	"	2 "	139 "
36. "	"	B	head	"	3 "	39 "
37. "	"	B	"	"	2 "	53 "
38. "	"	C	shoulder	multiple wounds through clothing	3 "	16 "

Method	Biting animal	Category	Site of wound	Wound	Interval between date of bite and beginning of treatment	Period of incubation
39. Högyes or Phillips	dog	C	hand	single wound on bare skin	4 days	31 d.
40. "	"	A	arm	multiple wounds on bare skin	7 "	—
41. "	"	C	hand	"	3 "	22 "
42. "	"	B	head	single wound on bare skin	5 "	—
43. "	"	C	trunk	multiple wounds on bare skin	1 day	40 "
44. "	wolf	B	head	"	2 days	23 "
45. "	"	B	"	"	2 "	30 "
46. "	dog	C	"	"	2 "	23 "
47. "	"	C	"	"	2 "	26 "
48. "	"	C	"	"	3 "	23 "
49. No history of the disease.						
50. Högyes or Phillips	dog	C	hand	multiple wounds on bare skin	2 days	—
51. "	wolf	C	head	"	1 day	—
52. "	"	C	"	"	1 "	—
53. "	"	C	"	"	1 "	—
1. Pasteur-Fermi	"	A	"	"	2 days	17 "
2. "	"	A	"	"	2 "	21 "
3. "	"	A	"	"	2 "	17 "
4. "	"	A	"	"	2 "	21 "
5. "	dog	B	"	"	2 "	22 "
1. Pasteur-Remlinger	"	C	hand	"	3 "	53 "
2. "	"	C	"	"	2 "	71 "

Method	Biting animal	Category	Site of wound	Wound	Interval between date of bite and beginning of treatment	Period of incubation
3. Pasteur-Remlinger	dog	C	head	multiple wounds on bare skin	3 days	11 d.
4. „	„	C	hand	„	—	46 „
1. Fermi	„	A	„	„	42 „	83 „
2. „	wolf	C	head	„	3 „	20 „
3. „	„	C	„	„	2 „	21 „
4. „	dog	C	„	„	5 „	27 „
5. „	„	B	„	single wound on bare skin	4 „	53 „
6. „	„	B	„	multiple wounds on bare skin	5 „	17 „
7. „	„	C	„	„	6 „	62 „
8. „	wolf	A	„	„	4 „	24 „
9. „	„	A	„	„	4 „	22 „
10. „	dog	C	„	„	9 „	22 „
11. „	wolf	A	„	„	29 „	50 „
12. „	dog	C	„	„	10 „	34 „
13. „	wolf	A	shoul- der	multiple wounds through clothing	35 „	45 „
14. „	dog	C	head	„	3 „	50 „
15. „	„	C	„	„	2 „	45 „
16. „	„	A	leg	„	—	73 „
17. „	„	C	arm	single wound on bare skin	4 „	90 „
18. „	„	C	head	multiple wounds on bare skin	4 „	18 „
19. „	„	C	„	„	3 „	21 „
20. „	„	C	hand	„	17 „	31 „

Method	Biting animal	Category	Site of wound	Wound	Interval between date of bite and beginning of treatment	Period of incubation
21. Fermi	wolf	C	shoulder	multiple wounds through clothing	5 days	25 d.
22. "	dog	B	hand	multiple wounds on bare skin	4 "	390 "
23. "	"	C	head	"	2 "	11 "
24. "	"	B	"	"	7 "	19 "
25. "	"	C	"	"	14 "	33 "
26. "	"	C	"	"	8 "	16 "
27. "	"	C	shoulder	single wound through clothing	2 "	33 "
28. "	"	C	hand	multiple wounds on bare skin	2 "	85 "
29. "	"	C	"	single wound on bare skin	2 "	209 "

SUPPLEMENT TO TABLE II.

Method of treatment	Biting animal				Category				Nature of bite			Site of wound				Number of days between date of bite and beginning of treatment				
	dog	cat	wolf	not specified	A	B	C	not specified	single	multiple	not specified	head	arms	legs	trunk	0-3	4-7	8-14	more than 14 days	not specified
Pasteur . . .	66	1	15	3	10	11	61	3	17	65	1	41	36	3	2	49	23	6	4	3
Fermi. . .	22	—	7	—	6	5	18	—	4	25	—	22	6	1	—	9	11	4	4	1
Phillips and Högyes . . .	42	1	9	1	5	8	39	1	6	42	1	29	20	2	1	28	17	1	1	6
Pasteur and Fermi. . . .	1	—	4	—	4	1	—	—	1	5	—	5	—	—	—	5	—	—	—	—
Pasteur and Remlinger .	4	—	—	—	—	—	4	—	—	4	—	1	3	—	—	3	—	—	—	1
Total	135	2	35	4	25	25	122	4	28	141	2	98	65	6	3	94	51	11	9	11

TABLE III.

Method	Sex	Age	Biting animal	Category	Wound	Number of days between bite and beginning of treatment	Number of inoculations
1. Högyes-Phillips	m	18	dog	B	slight; in arm	7	16
2. "	m	47	"	C	slight; in shoulder	4	11
3. "	m	22	"	C	severe; in legs	3	11
4. "	m	22	"	C	slight; in arms	9	9
5. "	m ²	30	"	C	contaminated by saliva	Not specified	8.46 mm.
6. "	m	8 1/2	"	C	"	"	8.23 mm.
7. "	m	13	"	C	"	"	8.46 mm.
8. "	f	13	"	C	"	"	9.37 mm.
9. "	m	27	"	C	"	"	8.46 mm.
10. Pasteur	f	—	"	C	hands: contaminated by saliva	2	17 ³
11. "	m	19	"	C	contaminated by saliva	6	
12. "	m ⁴	30	"	B	"	Not specified	20
13. "	m	28	"		on the legs	"	8 ⁵
14. "	m	42	"	B	scratches contaminated by saliva	"	14
15. "	f	54	"	A	slight scratch through the clothing (leg)	"	10
16. "	m	17	cat		slight; in arm	2	8
17. "	m	54	dog	A	scratch contaminated by saliva (hand)	4	12
18. Fermi	f	26	"	A	contaminated by saliva	5	13
19. "	m	43	"	A	slight; in legs	17	13
20. "	m	10	"	C	deep; hip wound	6	10

spinal cord

¹ Aggravated symptoms after 48 days. ² Previous influenza. day of treatment. ⁴ Syphilitic history. ⁵ 18 inoculations prescribed.

³ Fell ill with influenza on last

Interval between beginning of treatment and illness	Diagnosis or symptoms	Courses of the disease	Result of inoculating animals with the brain of fatal cases
19 ¹ days	Paraplegia	Became chronic	
15 "	"	Recovered after 2 1/2 months	
19 "	"	Improved after 8 days, recovered in 15 days	
22 "	"	Violent aggravation after 4 days, died	(No inoculation)
14 "	Meningo-encephalomyelitis	Died after 6 days	Rabbits and guinea pigs
13 "	"	"	Positive in rabbits
13 "	"	"	"
9 "	"	Died after 4 days	No post-mortem examination
25 "	Meningo-myelitis cervicalis subacuta	Recovered in 6 months	Partial infection of rabbits
11 "	Paraplegia, Landry type	Recovered in 4 months	
23 "	Paraplegia, Landry type; myelitis	Recovered in a fortnight	
8 "	Myelo-encephalitis	Slow recovery after 4 months	
14 "	"	Complete recovery after 2 months and 20 days	
13 "	Paraplegia of legs and n. facialis ⁶	Complete recovery after 5 weeks	
11 ⁷ "	Myelitis transversa	Became chronic	
19 "	Polyneuritis; paresis oculomotoria and trochlearis	Improvement	
18 "	Paraplegia, paresis n. facialis	Recovered after 2 months	Inoculation of rabbits negative.
After 13 inoculat.	Total paraplegia	Death after 10 days following symptoms of collapse	
After 10 days treatm.	Paraplegia of extremities; sensitiveness maintained	Improvement after 5 days, recovery after 9 days ⁸	

For the Director of the U. S. S. R. Health Intelligence Bureau for Foreign Countries:

(Signed) Dr. ETINGER.

⁶ Intestine and bladder not affected.

⁷ Generally unwell during treatment.

⁸ Inoculations are being continued.

	Number of cases	Percentage of total	Number of fatal cases	Percentage mortality
4. Classification according to variety of biting animal :				
Total number of animals	965	100	6	0.62
Dog	832	86.22	6	0.72
Wolf	101	10.47		
Solipeds	25	2.59		
Ruminants	7	0.72		
5. Evidence of rabies in biting animal :				
Category A	190	19.69	2	1.05
" B	105	10.88	1	0.95
" C	670	69.43	3	0.45
6. Depth of lesion :				
No visible lesion	669			
8. Position of bite (total)				
Head	15	1.56	4	8.2
{ single	49	5.08		
{ multiple	185	19.17	2	0.7
Arm	287	29.74		
{ single	19	1.97		
{ multiple	9	0.93		
Trunk	195	20.20		
{ single	206	21.35		
{ multiple				
9. Number of days after bite when treatment was begun :				
0 — 4	771	79.9	6	0.78
8 — 14	131	13.57		
15 — 21	25	2.59		
Over 21 days	38	3.94		

13. Information regarding fatal cases of rabies (see following table):

	Method	Scheme of treatment	Duration of treatment	Race	Biting animal	Category	Depth	Intervention of clothing	Position of bite	Lateness of arrival	Interval between bite and death	Post mortem	Animal Expt.
1	Dilution	Severe case	26 days	Europeans	Dog	C	deep	bare skin	ear and head	3 days	13 days	Did not show anything	
2	The 6 first days 2.5 cc. of a carbolised emulsion at 5 per cent	"	26 "	"	"	A	"	"	cheek, brow, eyes	1 day	15 "		
3	Dilution	light case	10 "	"	"	A	superficial	"	wrist	3 days	15 "		
4	"	severe case	26 "	"	"	C	deep	"	lips	1 day	15 "		
5	"	light case	10 "	"	"	B	superficial	"	face and teeth have been licked	3 days	14 "	Did not show anything	
6	"	severe case	26 "	"	"	C	deep	"	brow and wrist	3 "	24 "		