

Feb 24, 1911

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ORDINARY, MS.

<i>Public</i> DEPARTMENT
G.O., DATED 25-9-11
No. 835 ✓

INDEXED.

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[Despatch Abstract.]

*Recording put of
the L Fund kept
on the final report
by Major King
on the landline
scheme.*

BACK PAPER, No.

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READ AGAIN ORDER OF GOVERNMENT, DATED
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ENCLOSURES.

CURRENT No.

STATEMENT WITH DITTO.

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PAPERS NOT FILED UP, BRING WANT FOR DESPATCH
IN ORIGINAL (not paged).

N.B.—

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3RD SEPTEMBER 1891, No. 2128 L., LOCAL AND MUNICIPAL.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—again the following papers :—

G.O., dated 20th September 1890, No. 2406 L., Local and Municipal.

ABSTRACT.—Passing orders on the results of certain experiments made by Dr. King for the preservation of animal lymph, and sanctioning, in supersession of G.O., dated 21st July 1890, No. 1807 L., the revised scheme submitted by him for the establishment of vaccine depôts in the Madras Presidency.

G.O., dated 1st May 1891, No. 1045 L., Local and Municipal.

ABSTRACT.—Passing orders on the report by Surgeon-Major W. G. King on the lanoline-vaccine scheme for the quarter ending 15th February 1891.

READ—also the following paper :—

From Surgeon-Major J. A. LAING, Sanitary Commissioner, Madras, to the Chief Secretary to Government, dated Trichinopoly, 21st July 1891, No. B.

I have the honour to forward Surgeon-Major King's final report as to work accomplished while on special vaccine duty. My remarks on the report are written at foot of the paragraphs to which they apply.

2. With a view to showing Government the results obtained by the different methods of vaccination from 1st November 1890 to 31st May 1891, and from 1st November 1889 to 31st May 1890, I requested the Inspector of Vaccination to call upon the Deputy Inspectors of Vaccination to furnish this information at an early date. The returns received up to date have been entered in the following tables. Only *primary cases* of vaccination have been entered, all re-vaccination and unknown cases having been excluded.

[Statement.

NUMBER of Primary cases of Vaccination done from 1st November 1890 to 31st May 1891.

Vaccination circle.	Lanoline vaccine.		Fresh animal lymph (calf to arm.)		Preserved animal lymph.		Arm-to-arm operations.		Human lymph preserved in tubes.		Human lymph preserved between plates of glass.	
	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.
Vridhachalam ..	3,252	90.4	1,386	97.9	..	..	1,398	99.3	258	96.8	749	98.9
Krishnagiri ..	3,643	87.0	314	99.0	186	100	2,365	99.6	379	99.2	1,096	99.7
South Coimbatore ..	1,710	59.3	..	..	..	..	2,633	97.9	267	97.7	1,179	96.7
Cuddalore ..	..	..	4,606	89.4	..	..	633	94.6	1,107	95.3	40	90.0
North Coimbatore ..	3,000	80.3	1,031	96.7	119	100	2,838	98.7	476	95.8	906	98.4
Saidapet ..	9,381	92.9	2,341	96.19	6	100	12	100	..	..	..	..
Cuddalore ..	6,270	89.18	426	99.68	..	..	2,748	98.87	609	94.49	793	96.84
Vellore ..	7,863	86.87	..	..	..	..	383	96.63	223	98.20	633	96.84
Ongole ..	4,706	90.8	1,782	97.0	141	98.5	729	98.8	46	97.8	175	94.2
Negapatam ..	1,439	87.4	..	..	88	7.9	4,847	99.2	611	93.1	1,271	95.4
Palghat ..	..	..	2,431	98.1	3,325	95.09	3,847	96.2	1,013	90.7	965	92.6
Tinnevely ..	..	..	2,679	99.9	708	96.4	3,007	97.1	330	99.06	1,303	96.3
Chingleput ..	12,152	94.1	1,454	94.2	..	..	4,874	99.9	330	100	2,289	99.4
Sherm&devi ..	..	..	3,098	98.4	124	96.7	288	98.9	168	98.8	..	..
S&tr ..	..	..	1,074	99.8	513	98.2	5,068	99.09	512	98.4	1,742	98.7
Trichinopoly ..	5,615	90.47	5,699	98.68	..	..	4,748	99.9	177	98.01	2,163	97.8
East Coimbatore ..	4,054	82.36	..	..	..	..	4,681	99.03	705	97.74	2,102	97.14
Masulipatam ..	6,004	72.44	..	..	..	..	3,090	99.92	2,402	95.01	..	..
Guntur ..	82,14	98.14	1,486	98.04	597	87.93	4,127	99.73	3,873	98.16	823	100
Chittoor ..	6,859	98.14	682	98.97	..	..	756	99.20	210	99.52	327	99.69
Nellore ..	6,255	98.08	1,334	93.25	271	89.29	929	98.60	373	98.65	2,047	97.94
Calicut ..	1,530	86.88	467	96.57	1,486	91.11	2,136	97.89	699	93.66	289	98.26
Madanapalle ..	..	..	2,786	99.03	..	..	813	99.87	597	99.49	146	98.63
Penukonda ..	1,523	68.61	..	..	..	..	530	98.86	152	99.34	..	..
Total ..	90,067	89.16	35,077	96.31	7,564	93.16	61,373	98.78	14,921	95.66	22,340	97.81

NUMBER of Primary cases of Vaccination done from 1st November 1890 to 31st May 1891.

Municipalities.	Lanoline vaccine.		Fresh animal lymph (calf to arm.)		Preserved animal lymph.		Arm-to-arm operations.		Human lymph preserved in tubes.		Human lymph preserved between plates of glass.	
	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.
Erode ..	140	83.5	..	..	..	..	97	98.9	10	90.0	110	100
Chidambaram ..	175	96.5	208	100	13	100	..	..	..	..	..	..
Thirupati ..	4	100	283	99.2	..	..	..	..	..	..	..	..
K&r ..	40	82.5	..	..	1	100	71	98.5	7	100	7	85.71
Anantapur ..	2	100	..	..	..	..	135	97.0	16	100	28	96.4
Periyakulam ..	143	85.3	..	..	12	100	87	100	19	94.7	17	100
Cochin ..	71	85.91	..	..	..	..	113	94.69	289	95.50	37	88.48
Palacottah ..	..	..	692	95.2	130	90.7	154	100	51	92.15	330	96.36
Kumbakonam ..	..	..	458	77.5	2	100	28	100	..	..	..	..
Tellicherry ..	29	100	23	60.8	145	85.5	29	100	..	..	25	84.0
Coonoor ..	232	96.1	13,226	99.36	..	..	29	100	..	..	6	66.6
Madras ..	44	100	..	..	..	..	..	..	..	..	..	..
Cannanore ..	77	89.6	..	..	..	..	107	99.06	141	92.19	321	88.47
Tuticorin ..	..	..	31	100	616	92.54	..	..	..	..	..	..
Trichinopoly ..	412	97.8	5,795	98.12	..	..	..	..	..	..	..	..
B&r&da ..	190	85.7	..	..	..	..	280	95.2	..	..	..	..
Conjeevaram ..	1,411	97.51	..	..	..	..	33	100	163	97.5	..	..
W&l&j&pet ..	116	91.3	..	..	4	75.0	11	100	9	88.8	61	86.8
N&g&patam ..	238	86.5	1,051	94.2	27	81.4	..	..	..	..	..	..
Guntur ..	203	78.7	746	96.9	..	..	..	..	..	..	..	..
Mann&r&gudi ..	..	..	244	98.7	..	..	413	97.8	..	..	141	95.7
Srirangam ..	190	92.1	349	95.7	..	..	88	98.8	46	91.3	56	94.6
Cuddalore ..	598	92.1	..	..	..	..	..	..	..	..	..	..
Calicut ..	..	..	..	..	..	..	..	..	..	..	..	..
Cannanore ..	..	..	..	..	..	..	129	100	81	100	..	..
Vellore ..	714	94.25	..	..	..	..	..	..	..	..	..	..
Kurnool ..	..	..	623	97.51	..	..	..	..	..	..	..	..
Coimbatore ..	452	78.53	..	..	..	..	93	96.77	347	98.55	7	100
Dindigul ..	121	78.51	292	100	19	94.73	..	..	..	..	..	..
Palghat ..	101	93.06	..	..	71	98.59	8	100	558	96.95	..	..
An&apalle ..	465	65.59	..	..	..	..	131	97.70	14	100	..	..
Ch&acole ..	..	..	..	..	..	..	..	..	..	..	..	..
Vizian&grum ..	..	..	..	..	..	..	58	98.27	3	100	82	100
Bimlipatam ..	..	..	..	..	159	97.42	31	93.54	16	100	..	..
Total ..	6,178	89.93	23,921	98.10	1,199	91.30	2,105	98.24	1,770	96.55	1,228	93.56

NUMBER of Primary cases of Vaccination done from 1st November 1889 to 31st May 1890.

Vaccination circle.	Fresh animal lymph (calf to arm).		Preserved animal lymph.		Arm-to-arm operations.		Human lymph preserved in tubes.		Human lymph preserved between plates of glass.	
	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.
Vridhachalam	781	98-07	..	..	4,152	98-9	641	96-5	1,178	97-7
Krishnagiri	1,048	99-5	..	..	4,919	99-9	492	98-5	1,754	99-2
South Coimbatore	..	..	..	..	4,262	98-5	180	99-4	1,893	97-5
Cuddapah	..	..	..	..	854	97-5	1,417	95-3	301	93-3
North Coimbatore	..	..	..	..	4,185	98-5	772	97-6	2,209	98-05
Saidpet	..	..	32	87-5	1,112	95-5	308	86-6	7	85-7
Cuddalore	..	..	773	99-09	6,131	98-89	654	96-02	2,048	97-2
Vellore	..	..	..	..	4,597	98-54	1,096	96-89	2,738	97-29
Ongole	..	..	..	..	3,241	96-7	470	90-2	279	94-6
Nagapattinam	..	..	..	..	8,221	98-6	843	98-1	1,559	96-8
Palehat	..	..	51	58-8	6,184	96-9	732	91-8	2,500	96-04
Tanjore	..	..	405	93-08	7,253	97-8	1,163	95-5	2,283	94-7
Tinnevely	..	..	943	97-3	6,827	99-4	271	92-9	2,720	98-3
Chingleput	..	..	..	..	7,571	99-4	314	98-7	2,023	98-7
Shermadevi	..	..	..	..	3,569	99-1	731	99-04	2,347	98-5
Sattr	..	..	..	..	14,387	98-6	768	98-4	3,709	98-8
Trichinopoly	..	..	..	..	8,049	99-40	1,269	99-60	4,660	98-86
East Coimbatore	..	..	..	..	3,619	98-25	3,256	90-23	..	..
Manalipattam	..	..	298	69-46	1,622	99-50	2,119	89-14	..	..
Guntur	..	..	..	..	3,174	98-59	709	99-71	3,587	99-35
Chittoor	..	..	..	..	3,403	99-26	756	95-50	766	99-34
Nellore	..	..	1,861	94-94	3,211	96-82	1,603	92-32	1,812	96-85
Calicut	..	..	..	..	997	99-39	800	96-50	453	97-35
Madanapalle	..	..	13	23-07	1,267	99-92	438	98-40	399	98-99
Perukonda	..	..	..	..	..	..	..	..	..	..
Total	38,970	97-12	4,376	93-57	109,807	98-70	21,802	94-40	43,225	97-99

NUMBER of Primary cases of Vaccination done from 1st November 1889 to 31st May 1890.

Municipalities.	Fresh animal lymph (calf to arm).		Preserved animal lymph.		Arm-to-arm operations.		Human lymph preserved in tubes.		Human lymph preserved between plates of glass.	
	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.
Krode	..	..	..	..	221	100	66	96-9	124	98-1
Chidambaram	..	..	..	..	65	98-4	..	..	..	..
Thirupathi	..	..	123	94-3	5	80-0	55	89-09	20	98-0
Karur	..	..	..	..	176	97-73	15	93-33	28	92-86
Anantapur	..	..	..	..	125	99-2	16	92-8	16	100
Pariyakulam	..	..	15	93-3	152	98-02	17	94-1	25	100
Cochin	..	..	..	..	187	96-79	366	93-98	14	100
Palanicothah	..	..	..	..	172	98-83	..	..	252	98-01
Kambakonam	..	..	147	88-4	21	100	..	..	151	84-1
Tellicherry	..	..	285	77-3	29	95-8	46	84-7	81	97-5
Coonoor	..	..	117	94-0	97	93-3	41	46-3	50	76-0
Ongole	..	..	..	..	30	..	..	..	..	..
Madras	..	..	..	..	..	..	123	81-3	302	87-4
Cannanore	..	..	..	..	139	98-28	..	..	..	..
Tuticorin	..	..	..	..	1,541	98-11	20	90-9	1100	96-97
Trichinopoly	..	..	..	..	364	99-4	142	91-6	..	..
Basvada	..	..	193	96-3	6	100	485	96-4	148	98-6
Conjeevaram	..	..	..	..	..	..	..	..	..	..
Walajpet	..	..	..	..	..	..	..	..	..	..
Nagapattinam	..	..	..	..	52	94-3	53	94-3	2	100
Guntur	..	..	..	..	678	97-9	3	66-6	69	92-7
Manargudi	..	..	..	..	282	96-7	29	96-5	53	94-3
Srinagun	..	..	..	..	421	96-6	74	72-9	..	..
Cuddalore	..	..	747	88-1	..	..	..	..	..	..
Calicut	..	..	..	..	307	97-81	120	99-16	..	..
Cannanore	..	..	..	..	115	100	..	..	..	..
Vellore	..	..	126	99-20	638	98-88	487	94-04	..	..
Kurnool	..	..	6	100	76	98-33	6	83-33	..	..
Coimbatore	..	..	66	98-48	46	82-60	589	86-07	..	..
Dindigul	..	..	..	..	130	100	16	100	..	..
Palehat	..	..	73	80-00	..	..	168	75-31	32	68-75
Anakapalle	..	..	43	41-86	..	..	4	100	8	100
Chicasole	..	..	..	..	197	100	50	100	7	100
Vizianagrun	..	..	70	94-28	155	98-77	..	..	..	..
Bimlipattam	..	..	..	..	..	..	..	..	..	..
Total	20,218	97-67	2,523	88-50	6,367	98-08	2,987	90-29	2,580	93-79

These tables show the following results:—

1st.—That in vaccination circles the total percentage of success in primary cases done from 1st November 1890 to 31st May 1891 was highest in "arm-to-arm operations" and lowest in cases vaccinated with "lanoline vaccine." In all circles with the exception of Nellore the results obtained with fresh animal lymph were better than those with "lanoline vaccine." The results also in cases done with "preserved animal lymph" contrast favorably with those obtained with lanoline vaccine.

In Municipalities the total percentage of success was also highest in arm-to-arm operations and lowest in cases done with lanoline vaccine.

2nd.—In vaccination circles the total percentage of success in primary cases done with fresh animal lymph from 1st November 1889 to 31st May 1890 was 97.12 and with preserved animal lymph 93.57. These results are very similar to those obtained from 1st November 1890 to 31st May 1891.

In Municipalities the percentage of success was 97.67 with fresh animal lymph and 88.50 with preserved animal lymph. From 1st November 1890 to 31st May 1891 the percentages of success were 98.10 and 91.30, respectively.

The figures in these tables showing the percentages of success with the different method of vaccination and also the figures in the table sent with my letter, No. O.18, dated 11th June 1891, showing the percentage of insertion success with lanoline vaccine and fresh animal lymph obtained by various officers, all show that vaccinations done with fresh animal lymph are more successful than those done by means of "lanoline vaccine." Calf vaccination is much appreciated by the people and was daily gaining ground in the public estimation. When care is taken in conducting "calf-to-arm" vaccinations the results are as a rule successful and there can be no doubt that this system is more likely to prove popular and successful than that of vaccination by means of stored animal lymph.

ENCLOSURES.

From Surgeon-Major W. G. KING, M.B., C.M., D.P.H., Officer in charge of the Special Vaccine Supply Department, Bangalore, to the Chief Secretary to Government (through the Sanitary Commissioner for Madras), dated Bangalore, 10th July 1891, No. 370.

With reference to O.M., No. 502, dated 30th June, which reached me on the 3rd July 1891, I have the honour to forward herewith the report desired. As I depend upon the courtesy of the Sanitary Commissioner, and as these returns have not yet reached this office in full, it has been impossible for me to compile the results sooner. The last return for the "trained districts" referred to in the report reached me on the 8th instant, whilst several of the returns for other districts are not supplied up to date.

Remarks by the Sanitary Commissioner.

The monthly returns of vaccination take some time to prepare. The vaccinators (after verifying the results) send their returns to the Deputy Inspector of the Circle who compiles a return for his circle. This return is sent to the District Medical and Sanitary Officer of the district and he forwards it to the Inspector of Vaccination who has the control of the Vaccination Department. I may add that the vaccinators' weekly returns are sent in original direct to Dr. King by the Deputy Inspectors of Vaccination.

2. I would respectfully remind Government that expenditure for my establishment has been met by funds which represent an unexpended balance upon the sanctioned estimate up to the 15th May and that Rs. 3,663-9-9 is owed for outstanding debts which have purposely not been paid to permit of the possession of necessary funds, the actual available balance on the 15th May according to the revised estimate

being Rs. 3,135-9-9. I trust, therefore, that very early orders be given to the Accountant-General, pending the issue of formal orders, to meet my demands up to such sum as Government may think fit, having regard to the estimate herewith submitted.

FINAL REPORT ON LANOLINE VACCINE BY SURGEON-MAJOR W. G. KING, ON SPECIAL DUTY.

Work accomplished during the quarter.—I regret that it has not been possible for me to complete the task of supplying preserved lymph for the whole Presidency in the time allotted by Government. This has been due not only to the strain of meeting the various conditions of training my staff, opening depôts, and starting the work in various districts, but, latterly, to the difficulty in manufacturing instruments quickly enough to meet the demand. This difficulty was added to by my ordering the suspension of manufacture, consequent upon my not being aware of the course Government would take with regard to the Sanitary Commissioner's recommendation to condemn the instrument I had advocated. As soon as I found from G.O., dated 26th March 1891, No. 716 L., that this cessation of manufacture was not demanded by Government, I again turned my attention to their production. But, in the meantime, much time had been lost, and as without these it was impossible to commence work in new districts, advance has been slower than in the first quarter.

I have, however, since my last report, started the system in the following districts:—Bellary, Anantapur, Coimbatore, Kistnâ and Nîlgiris. The following

Municipalities have also been supplied in addition to those mentioned in my former report:—Anantapur, Berhampore, Bezvâda, Calicut, Cannanore, Chidambaram, Cochin, Coimbatore, Coonoor, Dindigul, Erode, Gudiyâtam, Guntûr, Karûr, Madura, Ongole, Ootacamund, Pâlghat, Pâni, Periyakulam, Rajahmundry, Srîrangam, Tellicherry, and Wâljâpet. The district and Municipality of Kurnool, on the recommendation of the District Medical Officer, have also expressed their willingness to adopt the system in lieu of the fresh lymph system worked there up to date. The Municipality of Nellore, availing itself of the permissive clause of G.O., No. 60 L., dated 12th January 1891, refused to use lanoline vaccine against the advice of the District Medical Officer and the Collector of the district. This Municipality has, however, always been exceptional in its management of matters vaccinal—vide G.O., No. 1802, dated 25th November 1890.

At the date of writing this report I have arranged to meet the vaccinators of Tinnevely and Cuddapah for instruction, so that these districts will be shortly added to the list of places where the scheme is in force. Further, one of my late Superintendents, now Acting Assistant Surgeon at Mangalore, will arrange this month to meet the vaccinators of the district of South Canara, so that they may also be trained. In anticipation of the sanction of Government, I am also supplying Cashmere, the Municipality of the City of Bangalore, and the Civil and Military station of Bangalore. Numbers of private practitioners have also been supplied on indent with samples of lanoline vaccine, as well as Medical officers of the British Medical Service for vaccination of troops.

Experiments conducted during the quarter.—Jenner, when announcing his discovery of the efficacy of vaccination, declared that cow-pox and small-pox were one and the same disease. This has been popularly assumed to be correct. But the complete proofs demanded by the medical profession have not been furnished, and this subject still remains open to discussion and doubt. Since this period half-a-dozen names can be quoted of medical men who have demonstrated the truth of Jenner's assertion; but on the other hand experiments conducted by an overwhelming majority go to prove that they are not the same disease. As to the successful experiments, some method of proving that deductions were wrongly drawn has constantly been made use of by a profession notorious for differing in opinion. Warned by the contentions thus raised, I conducted experiments and found that there can be no shadow of doubt that Jenner's assertion was correct. As a result of these experiments, I have

completely discarded the stock formerly used by me, viz., that derived from the Municipality of Madras, which was originally procured from Bombay, where Warlomont's stock from a case of natural cow-pox in Naples is in use. The lymph supplied by me is now exclusively derived from small-pox virus modified by transmission through the calf. Considering the superstition with which natives regard the question of small-pox *versus* vaccination, I think it is a matter of importance that it should henceforth be possible to say positively that lymph supplied by Government is small-pox lymph modified as to its characteristics by transmission through the "mother cow."

Renewed trial of glycerine preparations.—As stated in my former report, I received a specimen of lymph preserved by glycerine from Dr. Doering of Berlin. The specimen was reported to have been made on the 6th January 1891. On the 17th March a calf was inoculated. It gave 90 out of 121 insertions successful. A child was also vaccinated successfully by myself with it on the same date. On the same date a specimen was sent to the Acting District Medical Officer, Anantapur, thus giving it thirty miles' journey by road; with this he vaccinated a child successfully. On the 25th March a specimen would yield no continuous lines in the calf, but "took" here and there, and possessed a disagreeable odour. After this date the tube contents had an acid reaction, and was obviously decomposing. A specimen despatched to the District Medical Officer, Anantapur, on 22nd March failed in his hands.* During the period the German preparation was under observation, I repeated my experiments of making it locally, and also opened a tube of

*The last tube of the German preparation was retained till the month of May: it also failed in the same officer's hands.

the German product to check the results. I found that my former experiments were correct, the German material naturally decomposing more readily than that made locally. As suggested in my last report, there can be no manner of doubt that lanoline is the better preservative, and that it will stand what the glycerine preparation will not, that is, free exposure to air. So long as the glycerine preparation is hermetically sealed, its keeping powers are good; but without this precaution it is decidedly inferior in keeping powers to lanoline vaccine. My experiments showing that it was untrustworthy were made without the use of hermetically sealed tubes of the peculiar structure employed in Germany, and exposure to air was fully permitted. This test glycerine preparations fail to withstand; the lanoline preparation, irrespective of other peculiarly suitable properties, withstands such usage well. I consider that were lanoline vaccine to be distributed in hermetically sealed tubes, the period of the already excellent duration of activity might be indefinitely prolonged.

The lanoline preparation is undoubtedly more trustworthy in this climate than glycerine compounds.

I am therefore distinctly of opinion that in rejecting the glycerine preparation, and in advising the use of lanoline, I was right, in that the latter preservative is the better of the two; and, I may add, I have never asserted either more or less.

Remarks by the Sanitary Commissioner.

From the monthly return of vaccination received from the Tanjore Circle for May, there are 762 cases entered as vaccinated from "Glycerine paste" and the percentage of success was 93.1. Dr. Nailer, the District Medical and Sanitary Officer, has been asked to send a report on this subject.

Experiments as to duration of efficacy of lanoline vaccine.—I have been obliged to issue, on account of the numerous demands made, every particle of paste as fast as it could be produced. It has therefore not been possible to make many experiments as to duration. Besides, the question has lost interest, in the knowledge of the fact that it fulfils its functions as regards requirements of the Vaccination Department. Dr. Thompson of the Leprosy Commission has, however, been kind enough to perform

certain experiments with paste given to him by me on the 13th December 1890. This paste he had taken with him to Burma and the south and north of India during his tours. At the 130th day 25 out of 31 insertions in the calf "took," and two out of a total of 12 insertions made on children, this being equivalent to full success of two children if each had been vaccinated with six insertions, or of two out of three if they had been vaccinated with four insertions each. Lymph from the calf inoculated with this paste proved successful both in primary and revaccination cases. Surgeon Hendley, of Peshawar, in his report to the Sanitary Commissioner, Punjab, with paste supplied from Madras 97 days old, performed 16 primary vaccinations with only one failure. I myself got complete success with paste that had been to Darjeeling and back on the 137th day. Taking this evidence into consideration, there ought, I think, to be no doubt as to the "keeping powers" of lanoline vaccine.

So far as experiments have proceeded, lanoline vaccine has been found still active at the end of 137 days.

Remarks by Sanitary Commissioner.

With regard to the results obtained by Surgeon Hendley with lymph from 25 to 97 days old, I would refer Government to the table sent with my letter, No. O-18, dated 11th June 1891, in which the percentage of success and percentage of successful insertions are seen. They were, respectively, 89.3 and 72.3, and these rates contrast most unfavorably when compared with the results obtained in Madras with fresh animal lymph. Five hundred cases were taken at random when cholera was very prevalent in Madras and all verified by the Deputy Inspector of Vaccination, Madras Town. The results were: percentage of success 97.2, percentage of successful insertions 92.3.

As stated in my letter No. O-9, dated 8th May, forwarding letter No. 264, from Dr. King, "it is needless to comment on the fallacy of such reasoning."

Time required for operating with the Scarificator.—It may be of interest to state that, in operating upon soldiers with lanoline vaccine, it was found possible to vaccinate on one occasion 320, making two insertions on one arm in one hour and five minutes,* one medical officer scarifying with my instrument and two subordinates putting in the paste. With fresh lymph, 659 men were vaccinated in three hours and 45 minutes, two officers performing the operation complete and two subordinates extracting and two inferior servants handing lymph. It is hence evident that the instrument enables work to be performed most expeditiously, and I add, after using it upon a large number of European ladies and children, the operation by it when correctly conducted is the most painless possible.

Experiments as to the use of punctures with lanoline vaccine.—With regard to the use of the scarificator, I would refer to paragraph 3 of the summary and paragraph 6 of my letter, No. 115, dated 9th February 1891, embodied in G.O., dated 20th September 1890, No. 2406 L., and G.O., dated 26th March 1891, No. 716 L., respectively.

In these I had laid down that the use of scarification is that most advisable in a public system of vaccination, and I may add that, before the question of lanoline vaccine arose when Acting Inspector of Vaccination, I advised the Sanitary Commissioner to issue orders for the adoption of this mode in lieu of the puncture method. The question of the use of the scarification need, therefore, by no means be considered as indissolubly connected with the use of lanoline vaccine. I have already pointed out that this preparation can be used efficiently with the puncture method (G.O., dated 26th March 1891, No. 716 L.) although I consider it requires skill to use it efficiently. With reference to this fact, I quote the following experiment by the second-class vaccinator of Sembium; this exhibits this man's first effort.

Number of cases.	Nature of vaccine.	Name of operator.	Number of insertions.	Results per 100 cases. Insertion success.							Vaccination success per cent. of cases operated upon.	Remarks.
				Failure.	One vesicle.	Two vesicles.	Three vesicles.	Four vesicles.	Five vesicles.	Six vesicles.		
11	Lanoline vaccine.	Second-class Vaccinator C. Dorasawmy Mudali, of Sembium division, Saidapet range.	4	..	2-27	9-09	20-46	45-45	..	..	77-27	EXTRACT from report by the Deputy Inspector of Vaccination, Saidapet range, No. 691, dated 2nd June 1891. "These unsuccessful cases are among Jona-gars, the most opposing class. The vaccinator says that soon after the operation, the babies were taken in and the mothers wiped off the paste; hence the failures."
26			6	11-54	..	2-56	9-57	30-77	9-62	3-84	56-41	
37			..	8-11	5-50	4-00	12-00	34-00	7-50	3-00	61-00	

Remarks by Sanitary Commissioner.

When Dr. King advocated the adoption of scarifications when preserved lymph was used I did not think it advisable to introduce this system throughout the Presidency, considering the class of vaccinators employed and the habits and customs of the people. In Bombay all vaccinations are, as a rule, done with punctures, and the Sanitary Commissioner, in his report for 1889-90 (*vide* page 37), states "in other words the system which it is proposed to introduce necessitates a more expensive scarification of the skin of those operated upon than at present. Most of those who have operated on native children will be inclined to believe that this necessity for a more severe operation will not help to recommend the new procedure to the people."

I may add that in South Canara, where the District Medical and Sanitary officer takes great interest in vaccination, vaccinating by scarifications was introduced many years ago.

The use of the scarificator on this system has been employed as a lever by those who have considered it their duty to raise doubts as to the suitability of the system for this country, and I need hardly say that the wide publicity given to G.O., dated 12th January 1891, No. 60 L., must have materially tended to bringing about opposition to this method. That but solitary instances of opposition have arisen here and there throughout the country says much for the common sense of the people, considering the alarming criticism of the instrument therein indulged in. The question of the adoption of a suitable instrument is trivial in the extreme compared with the main point at issue, namely, the preservation of animal lymph sufficiently well to enable vaccinators to use this form in future instead of the human variety. As pointed out in the references above quoted, if a well educated and skilled class of men were employed, the question of how insertion of the paste is made need not be considered. My arrangements have been made to meet the requirements of an unskilled class of vaccinators. The testimony from medical officers of this and other Presidencies already forwarded proves that this simple instrument is very well suited for the object in view, and that it is, in fact, an advance upon forms in ordinary use of which, however, it is but a modification.

Remarks by Sanitary Commissioner.

It is difficult to understand how the publicity given to the Government Order mentioned can have affected the introduction of "lanoline vaccine" in rural tracts among illiterate people especially considering the great help which has been afforded to this system by Tahsildars, &c., when compared to the assistance given to other methods of vaccination.

Experiments as to the efficacy of lanoline vaccine by officers of other Provinces.—I have already forwarded reports by the Chief Medical Officer, Cashmir, the Deputy Sanitary Commissioner, Punjab, the Deputy Sanitary Commissioner, Bengal, the

Superintendent of Vaccination, Bombay, and Surgeon-Major Thompson, Deputy Sanitary Commissioner of North-West Provinces, and now member of the Leprosy Commission. The report of the last-named officer as to duration of efficacy has already been alluded to. *All agree without exception as to the preservative powers of lanoline.* The first, second and third named officers agree that it is as active as fresh lymph. The

The preparation is as active as fresh calf to arm-animal lymph. Deputy Sanitary Commissioner of the Punjab considers that in that part of the country the advantage of my preparation over ordinary tube lymph is so slight

that it is not worth while adopting it. I would, however, point out that Surgeon Hendley, Civil Surgeon, Peshawar, does not coincide with this estimate, and that this officer and the Civil Surgeon of Hissar obtained results that contrast with those

The scarificator is considered a painless and effective instrument. The latter officer has the kindness to approve strongly of the scarificator, and other officers comment

more or less favorably upon it, none doing so unfavorably.

Remarks by the Sanitary Commissioner.

The figures in the table sent with my letter, No. O-18, dated 11th June 1891, showing the results of the "first, second and third named officers" do not certainly prove that lanoline vaccine is "as active as fresh lymph." Take Madras, an excellent example, where 44 and 45 primary cases were respectively vaccinated with fresh animal lymph and "lanoline vaccine" under the supervision of Drs. Dymott, Nield Cook, and the Deputy Inspector of Vaccination. In both sets of cases the percentage of success was 100; but as regards the quality and activity of the lymph when judged by the number of insertions which took there can be no doubt of the superiority of fresh animal lymph. In the fresh animal lymph cases the percentage of successful insertions was 92.5, while in cases done with "lanoline vaccine" it was only 75.5. All the results in this table show that when judged by the "insertion success" that "lanoline vaccine" is much less active and certain than fresh animal lymph.

If I remember rightly two officers pointed out the difficulty (as I also did) of thoroughly cleaning the instrument after each operation. This is a very grave objection and an inspection of the instrument will show this to be the case.

The Senior Surgeon to the Government of Mysore, the Deputy Sanitary Commissioner, Bengal, the Medical Officers of Coorg and of Travancore have advised their Governments to adopt the system within their respective territories after satisfying themselves as to its trustworthiness.

FINANCIAL RESULTS.

Under the new conditions in Bangalore, I have to modify the financial forecast made in my report for the quarter ending 15th February 1891. If the results have not always coincided with the data therein given, it is due to the fact that I have had to contend with conditions unknown to me, conditions the knowledge of which could only be bought by experience. I have bought the experience dearly doubtless, but this having been secured, I trust it may be regarded as capital sunk for a good purpose, not lost. I have passed from disaster to disaster in my work. These may be honestly ascribed to the crude conditions under which I have attempted to carry out my duty.

In starting work at Bangalore, numerous petty difficulties were met with. Under instructions issued by the Government of His Highness the Maharajah of Mysore, efforts were made to send me supplies of calves from the surrounding districts. But the instructions were incorrectly interpreted by the Amildars, and many unsuitable animals reached me, and

even these were insufficient in number. I had hoped to get servants in plenty at Bangalore, but not a soul would come for the price fixed as sufficient in the Madras Presidency; the existence of the Kolar gold fields and other spheres for employment of manual labour enable the people to earn high wages. I could not keep either the Trichinopoly or the Madras depôts open, as I was threatened with legal proceedings if I did not vacate the buildings occupied. In the meantime, it had been impossible for me to secure sufficient accommodation for animals. In this condition of uncertainty, I was flooded with demands for vaccine. However, after six months' hard work, we did not feel inclined to be beaten by this combination of circumstances, so myself and staff took turns of duty as coolies, and, besides performing our professional work, fed and "watered" nearly 200 animals daily and cleaned the stalls satisfactorily until men were imported from Madras. Whilst thus short manned, a difficulty occurred that promised to wreck all our efforts. It had been the rule to wash all bandages for inoculated calves in the premises, but at this time they were sent to a dhobie. This dhobie did his best to produce white bandages by using lime. The result was that a vaccinator having been negligent on night duty as to retention of cleanliness of bandages, every animal in the stall undergoing incubation was damaged. I need not detail the anxieties or worries this entailed for about three weeks. No sooner had this difficulty been overcome than a batch of calves received from the Salem district imported foot and mouth disease. Before it was discovered, it had spread to others, and animals after animal had to be rejected.

To those who do not believe in lanoline vaccine, these disasters may furnish the moral that it is unsafe to trust so important work to one depôt where a breakdown may occur. But to myself, as a believer in this method, it teaches quite a different moral. These occurrences simply prove the trite fact that "bricks cannot be made without straw." It is idle, in short, for me to attempt to work one of the largest undertakings in the world at the present time for the production of preserved animal lymph without every needful appliance and accommodation. Thus the dhobie incident need not have occurred had I possessed correct accommodation for washing on the premises and a sufficient staff and servants for night duty. Nor need my establishment have been invaded with foot and mouth disease had I possessed isolation sheds, hospital sheds, &c. I trust, therefore, should Government now finally approve of the use of preserved animal lymph, that they will sanction adequate expenditure for necessary buildings.

Sanitary appliances and accommodation of a complete requisite nature and in the end the cheapest method to adopt.

It is useless to rely upon getting a sufficient supply of calves from the neighbourhood of Bangalore. Neither is it possible to obtain calves on hire at a reasonable price from the district of Salem and Hoosoor. I therefore find it necessary to import them from other districts by rail. Owing to a superstition amongst the ryots of Mysore that vaccination affects a calf injuriously so that in after-life no milk is given, I have found it difficult to part with the large number of calves at my disposal at a fair rate. Up to date I have sold 210 calves for Rs. 608-11-1. The average cost of calves imported is Rs. 6-5-2 each, so that the total cost of each calf vaccinated has been Rs. 4-15-10½ against Rs. 3-8-0, the average for all the five depôts proposed in my original communication in G.O., No. 2406, dated the 20th September 1890. This represents too great a loss, as the animals are chiefly of the fine breeds found in the Coimbatore district. I took occasion to represent to Mr.

Cost of calves.

Ricketts, the Director of Agriculture, that if he could buy these calves on behalf of the Government of Mysore, he would be enabled to improve the breed of cattle commonly possessed by the poorer ryots of this territory, these being, if the famous Mysore breed be excepted, exceedingly poor. He, after inspection, fully agreed with my opinion and has offered (subject to the sanction of the Mysore Government) to purchase all my imports that are healthy at the rate of Rs. 5 each. This will permit me in future to estimate the cost of vaccinating each calf at the rate of Rs. 1-5-2. Should the

Mysore Government not approve of Mr. Rickett's recommendation, I advise that I be allowed to rent large tracts of pasture ground and breed these animals in connection with the vaccine institute. I consider that undoubtedly large profit could be obtained. Almost all the animals are nearly two years old, so that they would soon be fit for breeding purposes. The majority are also cow calves; hence the stock would very quickly multiply. I need not say that the cost of upkeep in the midst of rich pasture lands of this territory would be very small. Besides, the profit that would result from breeding, there exist possibilities as to supply of the Madras, Bangalore, Bellary and Burma garrisons with beef, milk, butter, ghee, &c. I may here state that the Dewan to His Highness the Maharajah of Mysore has made me the very generous offer on behalf of his Government of permitting me to vaccinate the famous Mysore herd. If this be found feasible, with reference to their semi-wild condition, it will of course be possible to represent the cost of calves as *nil* for some time to come. I also take the opportunity of acknowledging the courteous attention afforded to my requirements on starting the depôt, received at the hands of the Deputy Commissioner Mr. Syed Nasiraddin, acting under the orders of the Government of His Highness the Maharajah.

Remarks by the Sanitary Commissioner.

In my letter, No. 1165-S, dated 20th March 1891, before the depôt was transferred to Bangalore, I pointed out that Dr. King had given no information as to the rate calves could be hired or bought at Bangalore and also if a sufficient number of calves could be easily obtainable there.

This superstition is not confined to Mysore, but is common in other parts of the Madras Presidency.

It is not stated what the extent, probable price, &c., of the rich pasture lands would be, also where such site would be available, the means of sending the lymph and what the cost of working the "Institute" and "dairy farm" would be.

Estimate for the remainder of the current year.—With reference to the preceding remarks, I submit an estimate for the current year on the basis found necessary in Bangalore. The increase in establishment advised is absolutely necessary. It must be remembered that the duty requires both night and day work, and, so far as I have been able to see, the staff recommended is the least that the duty can be correctly managed with. For example, with regard to the extra vaccinators required, I may state that it is not uncommon for vaccinators to have to perform duty every third night in addition to the ordinary 9 hours' day duty. This is too much to demand.

Under the conditions estimated for in the next ten months, the cost of material for each vaccinated case will be as follows:—

Cost of lanoline vaccine sufficient for one case at Bangalore according to present expenditure.

				Data.								
Establishment.						Other particulars.						
				RS.	A.	P.			RS.	A.	P.	
5	Superintendents at Rs. 75	..	..	375	0	0	Cost of each calf at Bangalore	..	4	15	10½	
7	Vaccinators at Rs. 20	..	..	140	0	0	Cost of feeding of each calf at Bangalore	..	5	0	0	
10	Servants at Rs. 7	..	..	70	0	0	for 15 days at 8 annas	..	0	13	4	
1	Duffadar at Rs. 9	..	..	9	0	0	Cost of lanoline at ½ d. per 100 grains	..	14	4	0	
2	Dhobes at Rs. 5	..	..	10	0	0	Postage at 4 annas per 100 cases	..	11	0	0	
2	Watchmen for calves	..	..	15	0	0	Contingencies	..				
1	Toty	..	..	6	0	0						
1	Tailor	..	..	6	0	0						
	Rent for the depôt	..	..	75	0	0						
Total per month				706	0	0						
Total per day				23	8	6½	Total				36	1 2½

	Pies a case.
I. Therefore the cost of material for a single case <i>inclusive</i> of establishment	3-55
Therefore the cost of material for a single case <i>exclusive</i> of establishment	2-75
II. But if each calf is sold, as anticipated at Rs. 5, the cost of lanoline vaccine per case will be <i>inclusive</i> of establishment	2-35
But if each calf is sold, as anticipated at Rs. 5, the cost of lanoline vaccine per case will be <i>exclusive</i> of establishment	1-55
III. If postage can be reduced to one anna upon each package, the cost per each will be :—	
i. <i>Inclusive</i> of establishment	Pies.
<i>Exclusive</i> of do.	3-31
	2-51
ii. But if the postage be reduced and calves be sold at Rs. 5 each to the Mysore Government the cost will be :—	
<i>Inclusive</i> of establishment	Pies.
<i>Exclusive</i> of do.	2-11
	1-31

Remarks by the Sanitary Commissioner.

In calculating the cost, the pay, travelling allowances, establishment of the officer in charge of the special vaccine depôt do not appear to have been included, but this should certainly be done. I therefore would suggest that a statement be submitted showing exactly the *entire* cost of the experiments up to date so that Government may see what the *total amount* of money spent in conducting the "lanoline vaccine" operations has been. The only possible advantage in conducting vaccination in the presidency *exclusively* by means of lanoline vaccine would be that of economy and therefore a statement should be submitted to draw a conclusion. I may mention in calculating the average cost of each successful case for the presidency, that the pay and allowances of the Inspector of Vaccination who controls the vaccine department are included.

With regard to postage, which is a heavy item, I should be glad if Government would permit all packages marked "vaccine" despatched by this department to go without postage. In any case, I shall be able to arrange to send out packages at a cost of one anna each way instead of two as at present by making the boxes, &c., of different material. This would reduce the average cost of material per case to 2-11 pies and 1-31 pies.

Proposal for the building of a Vaccine institute at Bangalore.—In the preceding paragraph I have pointed out how necessary it is that sufficient accommodation should be provided. I consider that it is advisable the following buildings be allowed :—

Quarantine sheds for the accommodation of sixty animals; shelter sheds for 150 animals; hospital for 16 animals; a specially constructed operation room; paste manufacture room; despatch room; inoculation stalls for 60 animals; straw godowns; store godowns; accommodation for depôt keeper, for orderly vaccinator and for orderly superintendent; coolies' huts; latrines; lavatory; wash-house; apparatus for lifting and distributing water.

I estimate roughly that a further expenditure of Rs. 8,000 or 10,000 would secure all that I require, and, considering that Government was willing to pay the sum of Rs. 80,000 for the scheme formerly presented by the Sanitary Commissioner, I trust this will not be grudged when it is regarded as expenditure that will not recur and is necessary for correct fulfilment of important work.

Remarks by the Sanitary Commissioner.

This is somewhat misleading. Government having ordered me to submit proposals for substituting animal vaccination for human lymph, I submitted a scheme for the further extension, if not exclusive use of animal lymph in the Presidency. I stated (*vide* paragraph 12 of my report) that "although the scheme proposed is the one I would suggest as a *temporary measure* as the *quickest* way of extending animal vaccination, still it is not one that I would recommend should be continued as a *permanency*" and at the same time I proposed that the vaccine department be re-organised and placed on a more satisfactory footing than it is at present. The total cost for the *entire* Presidency was estimated to amount Rs. 80,000, but excluding the agency tracts each

District Board and Municipal Council was expected to provide half the cost of the depôts existing within the local area or municipality concerned. The cost to Government would therefore have been Rs. 41,569-14-0, but what the cost of introducing "lanoline vaccine" including Doctor King's pay, &c., throughout the *entire* Presidency would be I cannot say.

The position of the preserved animal lymph scheme, with reference to the proposed re-organization of the Department.—I hoped

Information for re-organization scheme has not yet been supplied by the authorities concerned. Hence it is advisable to at once make certain suggestions.

not to require to touch upon this point until I forwarded the information demanded by Government for the re-organization of vaccination department as required in G.O., dated 12th January

1891, No. 61 L. I have applied to the Sanitary Commissioner for necessary information, who, in turn, has, I believe, applied to the authorities concerned. The result is, however, that at this date I find myself without any information as to the vaccinators of 11 out of the 21 districts. It is evident, therefore, that further delay must occur before a scheme can be forwarded to Government, and it is therefore desirable that I should anticipate. With respect to the preservation of the standard of efficiency of vaccine lymph, this Presidency has always occupied a peculiar position.

Remark by the Sanitary Commissioner.

Very voluminous information was required by Dr. King and the different departments (Presidents, District Boards, Principal, Medical College, Director of Public Instruction, District Medical officers) were requested to furnish it at an early date. Reminders were some time ago also sent. One President (Mr. Willock) objected owing to the extraordinary trouble it would give his staff.

In 1808, the British Government sanctioned the establishment of the "National Vaccine Institution," which concerns itself with the collection and distribution of lymph of "standard quality" so as to prevent the possibility of degeneration of the stock used by the nation. This has been of the greatest value in subserving the required purpose. But Madras has made no effort of this description, and has even foregone the arrangement made in other Presidencies of renewing annually the stock, by importation of English lymph, or by cultivation on the hills during the hot season. I believe from what I have seen of the results of vaccination with

humanized lymph in use is in a degenerate condition, no care having been taken to prevent this result.

that it is in a very degenerate condition. As an instance of this, I would quote the following return received from the Deputy Inspector of Vaccination of the Vinukonda Range, Kistna district, who had reported in his weekly diary of the 11th April to the Sanitary Commissioner that many children previously vaccinated had suffered from small-pox. In response to my query, he replied as follows :—

"With reference to your docket No. 266, dated 12th ultimo, I beg to state that the children under reference are said to have been vaccinated by humanized lymph, but not with lanoline vaccine paste, which was not then introduced in this range.

The number of children attacked with small-pox is 62, and their age is given in the subjoined statement :—

Children of 1 year of age.	2 years.	3 years.	4 years.	5 years.	6 years.	7 years.	8 years.	9 years.	10 years.	Adults of 22 years.	25 years.	Total.
1	12	5	9	4	13	7	5	3	1	1	1	62

Remark by the Sanitary Commissioner.

This is somewhat misleading. As far back as 1878 and 1879 I received both human and animal lymph from England and Brussels and also had calves vaccinated with small-pox virus. The results were unsatisfactory, and it was not thought advisable to continue these experiments. In most provinces in India (Punjab, North-Western Provinces, Berar, &c.) vaccination work is

only carried on during the cold weather months on the plains. During the remaining six months no vaccination at all is done except in the hill districts. To start vaccination at the beginning of the cold season in these provinces, it is therefore necessary that a very large supply of lymph be obtained. Just before the vaccinating season begins large quantities of lymph are obtained from subjects vaccinated in the hill districts and this supply is further supplemented by lymph received from Europe. In Madras, on the other hand, vaccination is carried on throughout the entire year both on the plains and hills. There is, therefore, not the necessity for obtaining lymph from Europe to start work with as in other provinces at the beginning of the cold weather. In this Presidency Deputy Inspectors take opportunities of exchanging lymph with other Deputy Inspectors, and in districts where animal vaccination was carried on, vaccinators were also supplied with animal lymph.

I have now been connected with the Sanitary department for over 13 years and have made many many tours through every district of the Presidency, but I cannot agree with Dr. King, who has a very very limited practical knowledge of the districts that "humanized lymph in this Presidency is in a very degenerate condition." In many parts of the Presidency excellent results are obtained with human lymph, but, of course, this all depends on the care and attention which is given to the subject. In some parts of Madras the results are unsatisfactory, but is this not the case with all methods of vaccination not only in Madras but every other Presidency in India?

With regard to the Deputy Inspector's (Vinukonda range) remark in his weekly diary of 11th April to the Inspector of Vaccination, it is not quite understood what is meant. It is not stated what form of human lymph was used, and according to the subjoined table the results obtained in April with lanoline vaccine were poor and contrast unfavorably with the results obtained with human lymph in March.

Number of cases vaccinated in the Vinukonda range.

	With lanoline paste.		Arm-to-arm operations.		Human lymph stored in tubes.		Human lymph stored between plates of glass.	
	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.
March	1,779	92.0	35	100	72	87.5	29	86.2
April	1,052	77.13	..	..	..	..	..	..

I grant that before any conclusion of value with regard to this statement can be made, it would be necessary to take a census of the whole of the vaccinated population and of the degree of chances of infection each suffered still, seeing that the degree of protection afforded by primary vaccination up to about ten years, according to the most recent statistics available, is very good, the attack rate being only 5 per mille; the population of vaccinated children amongst whom these attacks occurred should have been 12,400. This is an unlikely collection of vaccinated children of the age shown in one locality, especially in the backward district of Kistna vaccination of this sort, of course, can hardly be expected to gain the confidence of the people.

Whilst in England it has been thought necessary, where none but qualified educated medical men undertake vaccination, to prevent the possibility of degeneration by selecting and storing lymph, for distribution in this Presidency a most ignorant class of vaccinators have been forced to use any and every variety of lymph that could be obtained under

Humanized lymph is peculiarly tenacious of vitality; yet precautions have always been considered essential in other countries to prevent degeneration.

threat of fines and dismissal. Human lymph possesses great tenacity of life, otherwise under this treatment it must long since have absolutely expired. Such treatment will not, however, suit animal lymph, and I wish particularly to call the attention of Government to the fact that if it be wished to use animal lymph, it must be cultivated for distribution under skilled supervision.

Remarks by the Sanitary Commissioner.

There can be no comparison drawn between vaccination in England and India. In India the vaccinators are a different class of men. The habits and customs of the people are totally different, and in England vaccination is compulsory. Still how often are complaints brought against vaccinators even in England for using bad lymph, &c.

Animal lymph varies in quality with the most trivial alteration of conditions and treatment and it is impossible that it can be hoped that its characteristics and protective efficacy can be retained if careful and skilful methods be not employed in its production. I have compared side by side the results produced in the calf with lymph obtained from Bombay, Berlin, and Madras. I think I am right in saying that it is beyond all possibility of doubt that my present stock produces by far the finest and most typical vesicles.*

In the case of animal lymph such precautionary measures are for obvious reasons absolutely requisite.

* See accompanying copy of correspondence with the Administrative Medical officer, Her Majesty's Forces, Bangalore and Belgaum districts. Such material as I have seen in use in Municipalities in this Presidency as calf lymph I would not think of permitting to be utilized by this department. If this statement as to the importance of cultivation of lymph be true, it is obvious that it would be erroneous to trust to any system that involved the production of lymph in various parts of the country by inoculation of calves conducted by ignorant vaccinators, or even by medical officers incapable of devoting their time to this speciality. What would be the fate of animal lymph cultivated in 225 centres, as originally proposed by the Sanitary Commissioner, at the hands of an equal number of ignorant vaccinators I leave to imagination.

Haphazard systems must lead to degeneration of animal lymph.

as originally proposed by the Sanitary Commissioner, at the hands of an equal number of ignorant vaccinators I leave to imagination.

(1) Consequently, whatever be the decision of Government as to the use of lanoline vaccine, I regard the establishment of an institute where the cultivation of animal lymph can be conducted on scientific principles as essential for the correct conduct of vaccination in this Presidency.

Reasons for considering the establishment of a vaccine institute for the Madras Presidency advisable.

(2) I believe such an institute at Bangalore would be of much service as an educational centre, where all vaccinators and Deputy Inspectors could receive special instruction in the theory and practice of vaccination and in minor medical matters in connection with the numerous hospitals in Bangalore.

(3) Its existence would enable any part of the Presidency to be supplied at a short notice with a practically unlimited amount of preserved animal lymph for use during epidemics of small-pox.

(4) But, if, as I hope, Government regards lanoline vaccine as trustworthy, this institute should occupy its present position of being the place where animal lymph for the Presidency should be prepared and despatched.

Remarks by the Sanitary Commissioner.

The results with "lanoline vaccine" certainly cannot compare with those obtained in Madras town with fresh animal lymph and the excellent work in Madras is proved by the few deaths for the past six years which have been annually registered from small-pox.

The Municipalities alluded to are not mentioned, but in many—Vizagapatam, Chidambaram, Guntur, Tirupati, &c.—excellent work with animal lymph was done. In others, such as Kurnool, the work was bad and unreliable (*vide* my last inspection report on this town). The quality of the work chiefly depends on the care and attention given to it by the local medical officers who supervise as a rule the work of vaccination in Municipalities.

The temporary measure I propose (*vide* paragraph 4 of my letter No. 1213, dated 21st April 1890) was that "the depôts should as a rule be only at places where there was a hospital or dispensary and where or near where a Tahsildar or Deputy Tahsildar resided. The depôts were to be located in a corner of the hospital or dispensary compounds in order that the medical officer could see that due care was taken of the calves, that suitable calves were procured, and that the vaccinators vaccinated and extracted lymph from the calves properly. Further, the depôts being near where Tahsildars or Deputy Tahsildars resided, there would be no difficulty in obtaining a supply of calves and satisfactory arrangements could also be made for the payment of the calves hired or bought."

The position that should be occupied by preserved lymph in the department after its re-organization.—I have carefully refrained from expressing my views on this point beyond stating generally that I believe there existed a "proper place for both preserved and fresh lymph." I do not, and have not, advised that lanoline vaccine should be the only supply of lymph allowable to the Vaccination Department (*vide* paragraph 7 of my letter No. 115, dated 9th February 1891, embodied in G.O., dated 26th March 1891, No. 716 L.); but I certainly consider it must form the chief supply.

Under the re-organized system, it will be possible, wherever compulsory vaccination is in force, or where, by other means, it is possible to assemble on a certain day large numbers of people, to use fresh lymph. Where this is impossible, as in the greater part of the country, in the absence of compulsory vaccination it must be, I consider it essential that a continuous supply of preserved animal lymph should be arranged for, and, unless any better method of preservation than that advised by me be available, I consider lanoline vaccine will fulfil requirements and fulfil them well; as I have shown distinctly this preparation has given even better success than fresh animal lymph.

But, in advising the use of fresh vaccine lymph within certain limits, I consider that it is essential it be laid down that no subordinate in the Vaccination Department be allowed to transfer lymph from one animal to another and thus maintain a stock of lymph locally. If what I have said as to the importance of cultivating lymph have a grain of truth in it, it is essential that the parent lymph be always cultivated

Method of securing that animal lymph used throughout the country shall be uniformly of standard quality.

provided the subordinates have sufficient training as to selection of animals and their after treatment. The expenditure for calves thus used for the production of fresh lymph should be defrayed by local bodies in the areas where the officer responsible regards the use of fresh lymph desirable in consideration of the facilities offered for the assembly of large numbers upon definite dates. The cost of the supply of 'pre-served animal lymph should, I think, be met entirely from Provincial funds. In defraying this charge, Government will fulfil the responsible task of aiding the progress of vaccination by securing that the quality of lymph supplied throughout the country should not vary, but shall be without doubt the best that can be produced and that in periods of epidemics large supplies shall be available on demand.

Remarks by the Sanitary Commissioner.

In Madras town, as I have before mentioned, most excellent results have been obtained for years with fresh animal lymph and no town in India can compare with Madras as regards the satisfactory manner in which animal vaccination is conducted.

• The tables herewith attached show that the quality of the lymph does vary. Take Saidapet and Trichinopoly where it has been introduced some time. In Trichinopoly the percentage of success in May was only 87.9, while in February it was 96.8. Take also Ongole, Madurai and Dindigul and compare the success obtained in January with that in May. Take also Municipal towns—Negapatam, Mangalore, Srirangam.

Municipalities.	November.		December.		January.		February.		March.		April.		May.		June.	
	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.
Bellary ..	124	92·7	..	88·2	..	..	16	100·	..	90·6	..	8	..	..	..	..
Negapatam ..	69	71·0	17	88·2	125	96·8	148	92·6	75	90·7	75·0	79	94·9	..	..	..
Vellore ..	..	..	94	86·1	162	91·9	141	84·4	141	98·1	94·9	146	90·4	..	..	..
Trichinopoly ..	..	..	47	78·7	18	100·	136	97·	169	97·8	100·	64	..	..	..	..
Conjeevaram ..	..	..	414	96·6	256	96·5	215	93·9	224	94·0	95·7	157	97·4	..	..	..
Cocanada ..	..	..	46	93·6	..	..	..	814	814	80·6	39·6	426	..	..	..	..
Gudiyatam ..	..	..	..	..	11	90·9	29	82·7	31	46·1	90·6	32	..	..	..	..
Mangalore ..	..	..	..	..	21	95·2	30	50·0	26	..	98·3	62	..	..	..	..
Chidambaram ..	..	..	..	..	6	100·	4	100·	..	..	98·3	..	..	..	..	..
Tirupati ..	..	..	..	..	..	..	20	90·0	28	92·8	87·8	33	89·2	..	32	93·7
Wajapet ..	..	..	..	..	..	..	70	98·6	60	93·3	91·1	79	92·3	..	35	93·1
Nallore ..	..	..	..	..	..	..	..	..	44	77·2	85·5	..	..	..	..	..
Pennykalum ..	..	..	..	..	..	..	..	..	42	100·	60·8	..	..	..	..	..
Dindigul ..	..	..	..	..	..	..	..	..	1	97·6	92·7	69	88·4	..	74	90·5
Srirangam ..	..	..	..	..	..	..	..	..	43	81·3	97·7	78	95·8	..	..	..
Ouddalore ..	..	..	..	..	..	..	..	..	43	14·2	97·7	24	..	..	..	..
Guntur ..	..	..	..	..	..	..	..	..	7	90·8	92·5	94	95·0	..	..	..
Ongole ..	..	..	..	..	..	..	..	..	98	83·8	..	..	40	..	..	..
Ootacamund ..	..	..	..	..	..	..	..	..	68	..	76·0	25	55·0	..	23	86·9
Karur ..	..	..	..	..	..	..	..	..	..	..	86·6	142	..	..	..	..
Coimbatore ..	..	..	..	..	..	..	..	..	100·	..	..	2	..	..	..	..
Anantapur ..	..	..	..	..	..	..	..	..	..	..	84·1	63	97·8	..	..	..
Palghat ..	..	..	..	..	..	..	..	..	..	..	76·5	179	97·8	..	..	..
Masulipatnam ..	..	..	..	..	..	..	..	..	..	..	84·2	267	89·5	..	..	..
Calicut ..	..	..	..	..	..	..	..	..	..	..	88·3	534	89·5	..	..	..
Erode ..	..	..	..	..	..	..	..	..	..	..	78·8	85	90·9	..	70	86·7
Gochin ..	..	..	..	..	..	..	..	..	..	..	..	73	84·9	..	..	..
Mayavaram ..	..	..	..	..	..	..	..	..	..	..	..	67	96·5	..	..	..
Cannanore ..	..	..	..	..	..	..	..	..	..	..	..	13	76·9	..	..	..
Coonoor ..	..	..	..	..	..	..	..	..	..	..	..	103	78·6	..	..	..
	..	..	..	..	..	..	..	..	..	..	..	30	96·6	..	..	..

Districts.	Circles.	November.		December.		January.		February.		March.		April.		May.	
		Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.	Number vaccinated.	Percentage of success.
Saidápet	..	1,006	80.6	1,747	92.6	1,403	93.4	1,646	96.9	1,349	97.5	1,560	89.1	203	66.0
Chingleput	..	1,083	95.7	1,858	94.5	1,863	96.0	1,619	92.8	1,706	93.5	2,165	90.5	1,277	95.3
Trichinopoly	..	..	..	518	79.1	1,679	85.9	283	96.8	1,116	92.8	2,165	90.5	2,002	91.4
Vellore	..	..	..	737	90.3	1,616	91.3	2,098	92.9	1,824	93.0	1,295	93.5	1,086	97.9
Kirveenagar	..	..	..	442	96.6	1,106	97.2	1,194	94.1	1,059	96.8	1,423	97.6	1,147	95.4
Chittoor	..	..	..	371	97.8	1,275	97.6	1,265	96.9	1,463	97.87	1,072	95.4	933	95.6
Cuddalore	..	..	..	..	..	..	..	..	..	..	..	1,405	97.1	1,907	98.0
Vridhachalam	..	..	..	..	..	514	77.3	278	84.9	1,557	81.3	2,003	96.8	356	97.9
Kavali	..	..	..	..	..	509	91.9	..	..	1,577	81.3	2,003	96.8	1,618	97.6
Nellore	..	..	..	..	..	117	94.0	634	77.4	924	92.6	1,047	90.0	929	96.2
Ongele	..	..	..	..	..	596	94.8	1,395	91.9	1,745	93.8	1,060	96.2	701	97.4
Madura	..	..	..	..	..	394	88.3	425	92.2	1,444	92.0	1,851	95.7	1,288	98.7
Dindigul	..	..	..	..	..	490	89.0	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
Paranankudi	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
Goody	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
Harpanahalli	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
No. I, South Canara	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
No. II do.	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
Penunkonda	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
Salem	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
Namakkal	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
Vinukonda	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
Krishnagiri	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
East Coimbatore	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
North do.	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
South do.	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
Maunipatam	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
Guntur	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
Nilgiris	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
Do.	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
Do.	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
Palghat	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
Tellicherry	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5
Calicut	..	..	..	..	..	438	95.4	1,537	94.2	1,153	92.0	1,047	90.9	779	97.5

Amount of lanoline vaccine issued.—Enough lanoline vaccine for 333,403 cases

Preserved vaccine sufficient for 333,000 cases has been distributed.

concentration of the staff at Bangalore and the disasters described which followed, production of vaccine was of course much below what was calculated upon being obtained. Nevertheless, all demands by vaccinators for extra amounts of vaccine on account of small-pox being present in their divisions were promptly met, routine supplies in districts being delayed on an average of 5 days only. In addition, a large amount of fresh lymph and paste were used for vaccination of the officers, their wives, and the men of the garrison of Bangalore.

Vaccination results with lanoline vaccine.—In paragraph XI of my first quarterly report (G.O., No. 1045 L., dated 1st May 1891), I stated that "in skilled hands lanoline vaccine can compete effectively with fresh animal lymph, that is, calf-to-arm lymph, provided a due absorbing area be formed during its insertion." That this statement is correct, I would point to the accompanying memorandum of statistics. A perusal of this will show that in those districts, where the method has been continually in operation for (1) a period of from 4 to 7 months, the results are all that any reasonable person could wish; (2) whilst in places where training has been less prolonged, the results are proportionately poor. I, therefore, discuss results as they have been ascertained in trained and partially trained districts.

Districts that have been trained during a period of from four to seven months.—It is evident that, in spite of an unusually hot season, each of the six districts, where

"Vaccination success" has improved, not diminished during the hot weather: results differ simply with the amount of skill with which the preparation is used.

* See diagram.

from 95.17 to 91.37—92.85. I ascribe this result solely to the apathy of the Deputy Inspector in charge. He is a sickly man, and, if he continues to work there, I have little doubt that further decline in success will occur. In contrast with this range the Saidápet range of the same district has shown an almost uniform improvement. It will be noted, with reference to this range, that I have stated against the month

† 213 cases.

of May that the work of temporary vaccinators is excluded.† If the results obtained by these men were included, the percentage for the range would be but 92.65 per cent. I consider that nothing could well prove more thoroughly my statement that the results with this paste differ with the amount of skill and training exercised by the vaccinators [see paragraph XII of my report (G.O., No. 1045 L. of the 1st May 1891)]. In this range, which had hitherto given good results, and, as a matter of fact, did continue to do so during this special month, the average was rendered poor on account of the work of temporary and untrained men engaged on account of small-pox being prevalent. With the exception of the Chingleput and Vellore ranges, therefore, it will be seen that, notwithstanding the continued heat, there has been an increased percentage of success month by month as vaccinators became more accustomed to the work, till in the month of June the results may be well termed "excellent." I may here state that the results of the month of June are not, as in the case of all other figures used in the report, derived from the Sanitary Commissioner's office, but are compiled from the weekly reports of vaccinators to their Deputy Inspectors, which are submitted in original to me weekly. These reports are the same as those from which the Deputy Inspectors compile their monthly statements for the Sanitary Commissioner; so that there is no reason whatsoever to doubt their accuracy, although it is impossible for me to state that they have been derived from the Sanitary Commissioner's office. Arguing from

the rate at which information has been received from the Sanitary Commissioner as to the results of vaccination in May, it would be unlikely that I should receive returns for June till August; hence the necessity for the use of the original documents.

Districts trained from two to four months.—It will be seen that the percentage of success in these, as I foretold in my last report, is not good. But, nevertheless, it is clear that as the months pass, each district shows an improvement when compared with that preceding it. The Salem range of the Salem district and all ranges of Coimbatore particularly show bad results. In both districts opposition to the new method of vaccination arose. It was most unfortunate that I commenced operations just as the census had been taken. The taking of the census usually brings to the surface all sorts of absurd suspicions as to the intentions of Government, and on this occasion one of these was to the effect that the British Government intended to send a certain number of the inhabitants to the Mauritius and, as a preliminary to doing so, make them Christians. The appearance of the

Absurd ideas of the uneducated class of natives.

of vaccinators after this, working not as individuals but in groups, as I had directed them to do, confirmed the people in the idea that Government had evil intentions, and were making a pretence of using a new mode of vaccination to mark each person to be sent off. This was aided by the fact that re-vaccination of adults—quite a new procedure in Madras—was largely practised. The mark made by the scarificator, namely, four perfectly parallel lines, was said to resemble the Christian cross; although it no more does so than a house does a river. By a curious coincidence, some colour was given to the ideas of these people. I had in my first "Notes on Lanoline Vaccine" advised "cross scarification," as used in England, the object being to get a broad absorbing area. When the scheme was, however, launched, I found that the preparation was so active as to render the mode unnecessary, and it was therefore never practised by vaccinators. Want of success in these two districts may fairly be ascribed to the fact that if vaccinators in the disturbed parts vaccinated at all, they either were afraid to ascertain the results, or their patients simply washed off the paste as soon as it was put in. The Collectors of both districts took prompt measures to allay the false ideas that had been advanced, and, in the case of Salem, the opposition offered at first is fast dying out; in Coimbatore this is less marked, but nevertheless is on the decline. I have written to the District Medical officers of both districts, and pointed out that, whilst I prefer that scratches should be employed for insertion of the paste, the old method of puncture can be employed where it is likely that opposition may be kept alive, by adherence to the former practice. In the district of Madura, there has been a decrease of success rate, especially marked in the Dindigul range. I am about to proceed there to ascertain the cause. In connection with Dindigul, however, I have no doubt that the vaccinator's want of success is due to the ignorance of the principles of the method exhibited by Deputy Inspector G. Mangasamy in charge, as proved by correspondence with him. The most absurd results have been furnished by the District of Anantapur. This is geographically under the same conditions as the District of Bellary, and possesses much about the same class of vaccinators; yet, it will be seen, that whilst the Bellary range having exactly the same number of months of training has gradually raised its percentage of success from 94.54 to 95.92, the Anantapur district has but advanced from 34.55 to 69.15 per cent.

Remarks by the Sanitary Commissioner.

This is not "quite a new procedure in Madras."

Untrained Districts.—These represent localities that have been supplied with lymph, but which I have not yet been able to visit personally. The results are simply confirmative of the statement I

Untrained vaccinators produce bad results.

have reiterated, as to training and a certain amount of skill being requisite to obtain full results from the use of the preparation.

Remarks by the Sanitary Commissioner.

Among "untrained Municipalities" Cocanada and Mangalore are entered in the table. It is curious, however, that in November and December 1890 the percentage of success obtained in Mangalore was 95.24, while in February it was only 50.0 and in May 27.27. Last February I visited Cocanada and found the work done with lanoline vaccine most unsatisfactory. On inquiry I found the lanoline vaccine was of local manufacture and quite unfit for use, so I had it at once stopped and these results were not entered in the tables. Dr. Patch, who at that time went to Cocanada, sent to Madras for a supply of lanoline vaccine. This officer had been most successful in Chingleput in the matter of conducting "lanoline vaccine" operations and at once devoted his attention to introducing this system in Cocanada. The results obtained, however, in March and April were so bad that this method of vaccination was discontinued. The bad results pointed to the "lanoline vaccine" as the cause of such, for Dr. Patch took great pains to introduce this system and personally supervised the work.

Results obtained generally.—This scheme was sanctioned by Government, with the object of abolishing the use of human lymph. This has been accomplished in 31 ranges of 13 districts in which it has been introduced. In recommending this

The use of humanized lymph has been completely stopped in 31 ranges of 13 districts.

system to the notice of Government, in my letter No. 3433-S., dated 20th August 1890, embodied in G.O., No. 2406 L., of 20th September 1890, I stated that the preparation would, in skilled hands, prove as effectual as "freshly stored animal lymph." In my report, dated 15th February 1891 (G.O., No. 1045 L., of 1st May 1891), I informed Government that the results ascertained proved that I had undervalued the preparation, and that it was quite as effective as fresh, or calf-to-arm, animal lymph. As I, at the time of writing this report, had to deal with districts newly trained, it was necessary that I should omit for calculation groups of cases where I considered the system itself was not at fault, but the circumstances under which it was conducted. I thus asked for the indulgence of excluding certain groups, amounting to 3,891 cases, leaving 18,149 cases for consideration. On these latter cases, the percentage of vaccination success was found to be 94.67 per cent.; on this occasion, I ask for no such indulgence, and show that in eleven ranges of 5 districts, where sufficient time has elapsed to allow of fair experience of the method that, including cases rejected as just stated, from November 1890 to June 1891, that is, allowing for work through the hottest part of the year, an average of 94.03 vaccination success has been secured in 80,953 cases. Now, the average of success in the fresh lymph system for the year 1889-90, as stated in the Vaccination Report for that year, was 93.2 per cent. According to this statement, therefore, lanoline vaccine has obtained 83 per cent. greater success than fresh lymph. Again, according to reports specially furnished at my request by the Sanitary Commissioner from Deputy Inspectors of Vaccination, the average of vaccination success in 150,947 cases by fresh animal lymph, from April 1890 to January 1891, amounts to 92.15 according to the vaccinators; and 89.44 per cent. in 76,734 cases verified by the Deputy Inspectors; so that, even adopting the vaccinators' figures, lanoline vaccine has produced 1.88 per cent., and according to Deputy

Lanoline vaccine has given better "vaccination success" than fresh calf-to-arm animal from whatever point of view the statistical results of seven months' work be regarded.

Inspectors 4.5 per cent., better vaccination success than fresh animal lymph. In municipalities that have been trained for an equally long time, the success attained in 6,523 cases amounted to 92 per cent. But, taking the whole of the districts and municipalities trained up to date—by which it must be admitted that I have to include work of men who have not had yet time to exhibit sufficient skill to do justice to lanoline vaccine—the vaccination success secured in 138,485 cases was 89.98 per cent. or 54 per cent. better than the rate of success with fresh lymph, according to the Deputy Inspectors' reports alluded to. In this average, it must be remembered I also include results obtained in the Districts of Salem and Coimbatore, where it is doubtful whether, in a certain number of cases, any real effort was made to follow instructions given. But, I think, as I have clearly proved that a certain time is requisite for training of vaccinators, that the average result on the 90,000 cases performed in districts and municipalities having four to seven months' training, should be that accepted as correct; it being held in mind, at the same time, that as

the average includes the bad results turned out at first, that the probabilities are that by this system a still higher average than 94.03 per cent. thus gained, may be looked for in the future.

Remarks by the Sanitary Commissioner.

With regard to the statement made that lanoline vaccine is "quite as effective as fresh, or calf-to-arm, animal lymph," it is unnecessary for me to discuss at any length this point as the tables forwarded with my covering letter show that such is not the case. Further, as I will presently show, the percentages of success quoted by Dr. King are incorrect and the conclusions drawn from such inaccurate figures are valueless—

1st.—The percentage of success obtained with "lanoline vaccine" is compared with that stated in page 24 of the Vaccination Report for 1889-90. This report, I may remark, was written and forwarded to Government by Dr. King when he was acting both as Inspector of Vaccination and Sanitary Commissioner. Now in calculating the percentage of success all unknown cases have been excluded in operations done with "lanoline vaccine" but included in the cases vaccinated with animal lymph. If, however, the unknown cases are excluded in both sets of cases, the percentage of success obtained with animal lymph is 95.8 against 89.98 with lanoline vaccine. The percentage of success in cases done with animal lymph (fresh and preserved) for 1889-90 is therefore better than any of the groups of cases in Dr. King's table when the calculations are made in the same way.

2nd.—The figures quoted by Dr. King as cases done with "fresh animal lymph" are incorrect as they include cases done with preserved as well as with fresh animal lymph. Thus in the Nilgiris very few cases were done with fresh animal lymph—the majority being done with preserved animal lymph. In Vizagapatam district calf-to-arm operation are only done in Vizagapatam town, in all the other parts of the district the animal lymph used is preserved animal lymph. In other districts also many cases are done with preserved lymph and have been entered in the tables.

The percentage of success should be 95.8 and this is for animal lymph, both fresh and preserved.

These 150,947 were not all calf-to-arm operations—many having been done with preserved lymph.

The only objection I can see that can be raised to my argument is that the calculation is based, as far as possible, upon primary cases. Upon these only, of course, would it be possible to make a statement, and if the objection be raised in reference to the average for fresh lymph for 1889-90, I would point out that the total vaccination performed by the Vaccination Department for that year amounted to only 707 in 875,748 cases by all methods; whereas, during the time the lanoline vaccine system has been worked, there have been 3,522 cases performed by this method of vaccination alone. Moreover, as a matter of fact, it has not been possible for me to exclude re-vaccination results in no less than 42 individual monthly returns; so that a considerable proportion of re-vaccinations has been included to my disadvantage. Hence, granting that the figures given by the Sanitary Commissioner for this year's work include re-vaccination success also, and that, consequently, the comparison is not "fair," it is evidently a concession to contrast the rate of success with lanoline vaccine, with that by fresh lymph for 1889-90. But with reference to any question as to the "fairness" of this comparison, I would again remind Government that the fresh lymph system throughout the Presidency has been worked solely by vaccinators, specially selected for their skill, or, personally, by Deputy Inspectors; whereas lanoline vaccine has been placed in the hands of all classes of vaccinators, without distinction. In fact, in certain districts fresh lymph has been used side by side with lanoline vaccine, the latter has been placed at the further disadvantage of not being in the hands of the most skilled vaccinators who are absent on this duty. During February especially, as shown by the slight fall in the rate of success for March, the removal of the more intelligent vaccinators for census work must have produced an unfavorable influence upon the rate for lanoline vaccine. That results usually obtainable with ordinary form of lymph may be compared with those by lanoline vaccine, I would refer to the table at page 6 of the accompanying circular.

Remarks by the Sanitary Commissioner.

Animal lymph was also placed in the hands of all classes of vaccinators without distinction. Vide my previous remarks on these figures.

In submitting my scheme originally to Government, I estimated that an increase of 15 per cent. of work by vaccinators might be looked for in districts supplied. Thus in the months of April and May, it is found that, excluding the District of Salem, where, on account of opposition mentioned, vaccination was backward, 42,128 cases were performed against 34,701 of the last year in the corresponding months with lanoline vaccine—an increase of 24 per cent. Were re-vaccination cases included, a still greater percentage would be apparent. It is hence evident that this system, which places at disposal of vaccinators as much lymph as they choose to use, must greatly facilitate the progress of vaccination throughout the country.

Finally, I wish to respectfully represent to Government that I have laid before it the results of 90,000 cases in districts that have had the advantage of a fair amount of training, and that the percentage gained of 94.03 cannot be considered otherwise than good, when compared with the results secured by any other system with animal lymph as contrasted with humanized lymph, which naturally yields a better rate of success; and that I, therefore, hope it will be possible to state definitely, whether this method is approved by Government or not. So long as the system is termed "experimental," so long will every probationary vaccinator and Hospital Assistant in the country consider themselves authorities, entitled to give their individual opinions as to its merits. I would remind Government that such a state of affairs cannot be conducive to my obtaining the best results possible by this scheme, even if it not had been handicapped by circumstances, as has been the case—although I thankfully acknowledge that Government, throughout, has done its best to give it the "full and fair trial" promised.

Remarks by the Sanitary Commissioner.

The increase is chiefly due to the great help given by the Revenue authorities to this system. In Coimbatore district the numbers are decreasing notwithstanding all the help given and fining the vaccinators for short work.

In one district which shows bad results both as to quantity and quality of the work, it cannot be called "experimental" as a circular was sent to all vaccinators stating they would not revert to the old systems of vaccinating.

District.	Range.	April 1891.					May 1891.				
		Number vaccinated.	Results.			Vaccination success.	Number vaccinated.	Results.			Vaccination success.
			Number successful.	Number unsuccessful.	Number unknown.			Number successful.	Number unsuccessful.	Number unknown.	
		23	24	25	26	27	28	29	30	31	32
<i>Duration of training from 4 to 7 months.</i>											
Chingleput ..	Chingleput ..	2,173	2,012	102	59	95-17	2,089	1,852	175	62	91-37
..	Saidpet ..	1,485	1,366	80	39	94-47	1,260	1,191	44	25	96-44
..	Nellore ..	1,342	1,291	44	7	96-70	1,273	1,217	16	40	98-70
..	Ongole ..	1,124	1,010	92	22	91-65	807	738	58	11	92-71
..	Kavali ..	1,103	1,006	35	62	98-64	718	681	17	20	97-56
..	Chittoor ..	1,449	1,400	28	21	98-04	860	838	14	8	98-35
..	Vellore ..	1,428	1,362	23	43	98-34	1,180	1,091	48	41	96-78
..	Karvetnagar ..	1,047	971	44	32	95-66	835	875	36	24	96-05
..	Trichinopoly ..	1,482	1,216	79	187	93-90	869	762	64	63	93-30
..	Cuddalore ..	2,029	1,840	110	79	94-36	1,620	1,557	32	31	97-99
..	Vridhachalam ..	1,110	943	103	64	90-15	942	885	34	20	96-31
	Total ..	15,773	14,417	740	615	95-19	12,553	11,680	538	345	95-27
<i>Duration of training from 2 to 4 months.</i>											
Madura ..	Madura ..	891	803	70	18	89-22	..	..	..	..	..
..	Dindigul ..	1,789	1,259	431	99	74-49	..	..	..	..	..
..	Paramakudi ..	2,383	2,165	163	55	93-00	..	..	..	..	..
..	Bellary ..	1,327	1,247	53	27	95-92	1,206	1,146	34	26	97-97
..	Harpanahalli ..	..	..	..	..	..	..	..	..	..	..
..	Gooty ..	833	494	196	143	71-59	..	..	..	..	..
..	Penunkonda ..	594	262	268	64	49-43	..	..	..	..	..
..	Salem ..	1,193	891	225	77	79-84	898	744	121	33	86-01
..	Nemakal ..	460	333	82	45	80-24	..	..	..	..	..
..	Kistnagiri ..	1,224	1,043	129	52	88-99	970	884	45	41	95-15
	Total ..	10,694	8,497	1,617	580	84-01	3,074	2,774	200	100	93-28
<i>Duration of training below 2 months.</i>											
Coimbatore ..	North Coimbatore ..	1,360	876	481	3	69-69	932	611	206	115	74-78
..	South do. ..	1,411	919	312	180	74-05	899	561	207	131	73-05
..	East do. ..	1,232	841	256	136	76-64	868	655	116	97	84-95
..	Masulipatam ..	2,498	1,675	636	187	72-48	..	..	..	..	..
..	Guntur ..	2,047	1,652	343	52	82-87	..	..	..	..	..
..	Vinukonda ..	1,111	802	238	71	77-11	..	..	..	..	..
..	Nilgiris ..	102	97	2	3	97-85	157	142	5	10	96-60
..	South Canara ..	..	..	..	..	..	..	..	..	..	..
..	Tellicherry ..	609	506	72	31	85-81	1,010	873	95	42	90-18
..	Palghat ..	677	345	133	199	76-36	..	..	..	..	..
	Total ..	11,047	7,712	2,473	862	75-72	3,866	2,842	629	395	81-94
	Grand Total ..	37,513	30,626	4,830	2,057	86-38	19,493	17,296	1,357	840	92-73

* Two hundred and thirteen cases, the work of five men temporarily employed as vaccinators, are excluded in this month—W. G. K.

District.	Range.	June 1891.					Total.				
		Number vaccinated.	Results.		Vaccination success.	Number vaccinated.	Results.		Vaccination success.		
			Number successful.	Number unsuccessful.			Number successful.	Number unknown.			
		33	34	35	36	37	38	39	40	41	42
<i>Duration of training from 4 to 7 months.</i>											
Chingleput ..	Chingleput ..	669	611	47	11	92-85	14,779	13,377	809	593	94-29
..	Saidpet ..	465	453	8	4	98-26	10,633	9,828	611	194	94-15
..	Nellore ..	745	703	13	29	98-04	7,776	7,177	302	297	95-96
..	Orgole ..	143	121	6	16	95-28	4,912	4,393	426	93	91-16
..	Kavali ..	..	..	..	..	..	3,620	3,132	260	128	92-33
..	Chittoor ..	743	690	25	28	96-50	7,370	7,128	153	89	97-76
..	Vellore ..	606	485	15	6	97-00	9,147	8,516	429	202	95-20
..	Karvetnagar ..	268	247	4	7	98-40	5,511	5,211	219	121	96-18
Trichinopoly ..	Trichinopoly ..	..	..	..	..	..	6,449	4,626	452	471	90-72
..	Cuddalore ..	932	895	9	28	99-00	7,554	6,519	682	353	90-53
..	Vridhachalam ..	523	493	15	15	97-05	3,962	3,431	326	205	91-32
Total ..	Total ..	4,984	4,698	142	144	97-07	80,953	73,538	4,669	2,746	94-03
<i>Duration of training from 2 to 4 months.</i>											
Madura ..	Madura ..	..	..	..	..	..	2,916	2,652	199	65	92-83
..	Dindigul ..	..	..	..	..	..	6,147	4,860	962	345	93-61
..	Paramakudi ..	..	..	..	..	..	4,621	4,211	224	186	94-95
Bellary ..	Bellary ..	..	..	..	..	..	211	189	21	1	90-00
..	Harpanahalli ..	..	..	..	..	..	1,351	818	317	216	72-07
..	Gooty ..	..	..	..	..	..	1,117	659	364	94	64-41
Anantapur ..	Penunkonda ..	..	..	..	..	..	3,959	2,482	733	744	77-20
..	Salem ..	..	..	..	..	..	964	618	198	248	72-34
..	Namakal ..	..	..	..	..	..	3,711	3,036	440	255	87-34
..	Kistnagiri ..	..	..	..	..	..	33,278	27,020	3,949	2,309	87-25
Total ..	Total ..	..	..	..	..	..	80,953	73,538	4,669	2,746	94-03
<i>Duration of training below 2 months.</i>											
Coimbatore ..	North Coimbatore ..	..	..	..	..	..	3,817	2,734	872	211	75-82
..	South do. ..	..	..	..	..	..	3,116	1,792	649	675	73-41
..	East do. ..	..	..	..	..	..	4,441	3,339	703	399	82-61
..	Masulipatam ..	..	..	..	..	..	3,460	2,259	979	222	69-77
Kistna ..	Guntur ..	..	..	..	..	..	3,679	2,958	627	94	82-51
..	Penunkonda ..	..	..	..	..	..	2,927	2,439	380	108	86-52
..	Nilgiris ..	..	..	..	..	..	259	239	7	13	97-15
..	South Canara ..	..	..	..	..	..	209	135	30	44	81-82
..	South Canara ..	..	..	..	..	..	1,619	1,379	167	73	89-20
..	Tellicherry ..	..	..	..	..	..	677	345	133	199	76-36
..	Palghat ..	..	..	..	..	..	..	..	..	..	..
Total ..	Total ..	..	..	..	..	..	24,204	17,619	4,547	2,038	79-49
Grand Total ..	Grand Total ..	4,984	4,698	142	144	97-07	1,38,435	1,18,177	13,165	7,093	89-93

[illegible]

Municipalities.	April 1891.						May 1891.						Total.			
	Results.			Vaccination suc- cess.	Number vaci- nated.	Number suc- cessful.	Results.			Vaccination suc- cess.	Number vaci- nated.	Number suc- cessful.	Number un- known.	Number un- known.		
	Number suc- cessful.	Number un- known.	Number suc- cessful.				Number un- known.									
	Number vaci- nated.	Number suc- cessful.	Number un- known.	23	24	25	26	27	28	29	30	31	32	33	34	35
Duration of training from 4 to 6 months.																
Trichinopoly	66	64	2	100-00	56	48	4	92-31	1,010	815	118	77	87-35			
Nellore	79	72	7	91-14	25	23	1	95-83	310	273	18	25	83-81			
Ongole	94	87	7	95-60	25	23	1	95-83	188	176	18	6	96-17			
Cuddalore	90	86	4	97-73	160	153	3	97-45	303	255	29	19	89-79			
Negapatam	8	6	2	75-00	32	28	4	96-75	525	459	44	22	91-25			
Conjeevaram	231	218	13	96-46	32	28	4	96-75	822	785	24	13	97-03			
Tirupati	35	29	6	90-62	138	130	8	98-75	145	116	16	13	100-00			
Gudiyatham	78	75	3	97-40	78	69	9	88-46	20	18	2	1	87-88			
Walajabad	69	64	5	92-75	23	21	2	91-30	640	599	40	1	90-00			
Vellore	31	28	3	90-32	487	456	1	100-00	190	175	15	1	93-74			
Srirangam	578	472	106	88-33	66	64	2	91-07	1,891	1,580	166	136	92-73			
Chidambaram	64	61	3	96-39	45	44	1	96-52	102	86	6	7	90-60			
Puducherry	57	51	6	91-07	67	64	3	96-52	86	82	3	1	95-05			
Meyyaram	18	18	0	100-00	45	44	1	100-00	45	44	1	1	96-47			
Madras	1,498	1,331	104	92-75	1,188	1,045	75	93-30	6,523	5,707	496	320	100-00			
Total	62	30	29	50-86	63	61	2	98-38	132	97	31	4	75-78			
Dindigul	..	..	..	89-58	82	45	7	86-54	48	44	4	..	91-67			
Bellary	..	..	..	100-00	..	..	..	..	146	122	21	3	85-31			
Periyakulam	..	..	..	..	..	..	..	..	2	2	..	..	100-00			
Anantapur	..	..	..	..	..	..	..	..	39	21	16	2	56-75			
Palni	..	..	..	..	..	..	..	..	367	286	72	9	79-89			
Total	113	75	34	63-81	115	106	8	92-98	367	286	72	9	79-89			
Duration of training below 2 months.																
Coimbatore	140	122	17	87-77	167	82	67	55-03	307	204	84	19	70-83			
Karur	26	19	6	76-00	..	..	..	..	25	19	6	1	76-00			
Ootacamund	262	223	39	88-49	164	135	29	82-32	75	63	11	1	85-13			
Masulipatnam	..	..	..	..	47	44	3	93-62	416	368	58	..	86-06			
Conoor	90	67	18	78-81	55	50	5	96-91	145	117	23	5	93-63			
Erode	507	431	70	86-03	433	311	104	76-06	1,015	805	185	25	81-31			
Total	2,118	1,837	208	89-83	1,736	1,462	187	88-66	7,905	6,798	753	354	90-03			
Grand Total of Trained Municipalities	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Municipalities.	November and December 1890.				January 1891.				February 1891.				March 1891.			
	Results.		Vaccination suc-cess.		Results.		Vaccination suc-cess.		Results.		Vaccination suc-cess.		Results.		Vaccination suc-cess.	
	Number vaccinated.	Number suc-cessful.	Number un-suc-cessful.	Number un-known.	Number vaccinated.	Number suc-cessful.	Number un-suc-cessful.	Number un-known.	Number vaccinated.	Number suc-cessful.	Number un-suc-cessful.	Number un-known.	Number vaccinated.	Number suc-cessful.	Number un-suc-cessful.	Number un-known.
Cocanada ..	46	43	3	93-48	..	..	..	..	..	..	..	..	993	440	374	179
Cochin ..	21	20	1	95-21	..	..	..	..	..	..	..	..	..	..	..	..
Mangalore ..	15	13	2	86-67	..	..	..	..	..	..	..	..	..	..	..	..
Cannanore ..	82	76	6	92-68	..	..	..	..	..	..	..	..	993	440	374	179
Total of untrained Municipalities ..	1,326	1,093	162	71	87-09	305	256	26	91-76	66	30	91-58	2,711	1,963	502	246
Grand Total ..	1,326	1,093	162	71	87-09	305	256	26	91-76	66	30	91-58	2,711	1,963	502	246

Untrained Municipalities.

Municipalities.	April 1891.				May 1891.				Total.			
	Results.		Vaccination suc-cess.		Results.		Vaccination suc-cess.		Results.		Vaccination suc-cess.	
	Number vaccinated.	Number suc-cessful.	Number un-suc-cessful.	Number un-known.	Number vaccinated.	Number suc-cessful.	Number un-suc-cessful.	Number un-known.	Number vaccinated.	Number suc-cessful.	Number un-suc-cessful.	Number un-known.
Cocanada ..	426	169	257	39-67	..	..	..	..	1,465	652	834	179
Cochin ..	26	12	14	46-15	..	..	..	..	71	61	10	..
Mangalore ..	..	..	..	..	..	..	..	..	121	59	62	..
Cannanore ..	452	181	271	40-04	..	..	..	..	28	23	5	..
Total of untrained Municipalities ..	..	..	..	..	..	..	..	..	1,085	795	711	179
Grand Total ..	2,570	2,018	479	73	80-92	1,864	1,545	87	9,590	7,593	1,464	533

Untrained Municipalities.

Government Vaccine Institute.

ESTIMATE of probable cost for the introduction of Lanoline Vaccine from 15th May 1891 to 31st March 1892 throughout the Madras Presidency.

1	2	3	4	5	6	7	8	9
Hire or purchase of calves, at Rs. 4 each (required number 75 a week).	Cost of feeding of calves (200 a day, at 8 pies each).	Cost of shaving of calves (two barbers on Rs. 8 and Rs. 7 a month).	Superintendents (five on Rs. 75 each).	Vaccinators (seven on Rs. 20 each).	Servants (one duffadar at Rs. 9, and ten servants on Rs. 7 a month).	Watermen for calves (two on Rs. 7 each).	Tailor for making and repairing bandages for calves (one on Rs. 7).	Dhobies (two on Rs. 5 each).
Rs. 12,600	Rs. 2,675	Rs. 158	Rs. 3,938	Rs. 1,470	Rs. 830	Rs. 147	Rs. 74	Rs. 105

10	11	12	13	14	15	16	17	18
Toty (one on Rs. 6.)	Rent for depot (Rs. 75 a month.)	Contingencies.	Service stamps and bearing charges.	State telegrams.	Cost of conveyance of re-turn paste boxes from different vaccinators.	Wear and tear at 25 per cent. on instruments and articles required for manufacture and transport of paste.	Total.	Remarks.
Rs. 63	Rs. 788	Rs. 800	Rs. 1,200	Rs. 100	Rs. 1,200	Rs. 1,200	Rs. 27,348	Present estimate for 10½ months .. 27,348 0 0 " " " 6 months .. 15,627 7 0 " " " 12 months .. 31,265 0 0

From Surgeon-Major W. G. KING, M.B., C.M., D.P.H., Officer in charge of the special Vaccine Supply Department, Bangalore, to the Deputy Surgeon-General, Her Majesty's Forces, Bangalore, dated 3rd July 1891, No. 360.

I have the honour to inform you that I am about to submit a report to Government on the progress of work effected by me. In this report I call attention to the well-known fact that animal lymph requires special care for its cultivation, and that only in institutions specially arranged for the purpose can this care be efficiently provided. There is perhaps no better test of the activity of lymph than the rate of success in re-vaccinations. As in this garrison I have had the pleasure of placing at your disposal a considerable amount of lymph for the re-vaccination of men and officers who have had the advantage of being vaccinated with presumably good lymph in England, I should be obliged by your stating whether you consider the supply was not of as good or better quality than that usually obtainable in this country.

2. I have also used throughout the operations a simple form of scarificator. May I ask you to inform me whether you regard it as an efficient and safe instrument, and whether or not it is causative of pain.

3. Would you kindly give me a reply as early as possible.

From the Administrative Medical Officer, Her Majesty's Forces, Bangalore and Belgaum districts, to the Officer in charge of the special Vaccine Supply Department, Bangalore, dated 7th July 1891, No. 959-E.

In reply to your letter, No. 360 of 3rd instant, I have the honour to state that I consider the animal lymph supplied from your depôt is better and more efficacious than any other lymph I have seen supplied in this country.

2. As regards the scarificator used by you, I can, from personal experience, say that it is an efficient and safe instrument, and that it causes little or no pain.

From Surgeon-Major W. G. KING, M.B., C.M., D.Ph., On Special Duty, to the Chief Secretary to Government (through the Sanitary Commissioner for Madras), dated Bangalore, 18th July 1891, No. 377.

With reference to my report, dated the 10th July 1891, forwarded to you through the Sanitary Commissioner, I have the honour to submit, herewith, in original, a statement by Surgeon-Major Thomson, Deputy Sanitary Commissioner, North-Western Provinces, and now member of the Leprosy Commission. From this it will be seen that lanoline-vaccine six months old was used by him for inoculation of calves successfully, and that with lymph obtained from a calf thus inoculated vaccination of children was also conducted with success. I would call attention to the fact that in the course of his duty as a member of the Commission, Dr. Thomson had travelled to various places and that consequently the paste has been exposed in a most unusual manner to the various conditions of climate and the exigencies of travelling, and had been opened and exposed to air for use during his tour in Burma, if not elsewhere. Indeed, the specimen did not have the advantage of the slightest protection from air, which material I now send out is afforded by a recent improvement.

2. It is advisable I should add that the specimen of paste given by me to Dr. Thomson was not specially selected with the object of experiments being made with it. It formed simply a part of the ordinary issue of the day on which the members of the Leprosy Commission were kind enough to visit my depôt at Madras.

3. Dr. Thomson, as an impartial professional observer, had the kindness to inform me that he had told Dr. Laing (who wrote some time back to him officially asking for a report of his experiment) that these were conducted "under favorable conditions of climate"—referring to Simla. But, it is evident, that this fact need not discount the exposure to climatic influences already undergone by the preparation before its arrival at Simla, nor the fact of retention of energy for a period of six months—at the end of which time the conduct of further experiments was stayed, not by the limit of activity having been ascertained, but by the exhaustion of the specimen.

From Surgeon-Major J. A. LAING, Sanitary Commissioner for Madras, to the Chief Secretary to Government, dated Trichinopoly, 25th July 1891, No. D.

I have the honour to forward, herewith, supplement to report on lanoline-vaccine, dated 10th July 1891, from Surgeon-Major W. G. King.

ENCLOSURES.

From Surgeon-Major S. J. THOMSON, Bengal Medical Service, to Surgeon-Major W. G. KING, Madras Medical Service, dated Simla, 12th July 1891, No. 39-C.

I have the honour to forward a brief statement of the result of the experiments I performed with the lanoline paste prepared by you on 13th December 1890.

The paste remained in a box with me during December and January in Madras, Burma and Bengal. In February and March it remained in Bengal and the North-Western Provinces. I was sent to Simla at the end of the latter month.

During April I vaccinated a calf and some children with the paste. The results were communicated to you in a former letter.

On May 15th I again used the paste, taking lymph from the successfully inoculated calf on the 23rd of the same month, and vaccinating children with it.

On June 3rd, I inoculated a calf without result. I am unable to explain this as the procedure was exactly the same as that adopted in the other experiments.

On June 11th, I successfully inoculated a calf with the remaining portion of paste, and from this animal a number of children were vaccinated. The paste was then 6 months old. The results of these operations are detailed in the accompanying tables. A few of these were verified by me and the rest by the Native Superintendent of Vaccination.

Second Calf vaccinated on 15th May 1891.

Lymph taken May 23rd.

No.	Month and date.	Male or female.	Primary or secondary.	Number of points of insertion.	Successful or unsuccessful.	How many successful points of insertion.
1	23rd May 1891	Male	Primary	3	Successful	3
2	23rd "	"	"	3	"	3
3	23rd "	"	"	3	"	3
4	25th "	"	Secondary	3	"	3
5	25th "	"	Primary	3	"	3
6	26th "	Female	"	3	"	3
7	26th "	Male	"	3	"	3
8	26th "	"	Secondary	3	"	1
9	26th "	"	"	3	"	1
10	28th "	"	Primary	3	"	1
11	28th "	Female	Secondary	3	"	1
12	30th "	Male	Primary	6	"	5
13	30th "	"	Secondary	3	"	1
14	8th June 1891	"	"	3	"	1
15	8th "	"	"	3	"	1
16	8th "	"	"	3	"	2
17	8th "	"	"	3	"	1
18	8th "	"	"	3	"	2
19	11th "	"	"	3	"	1
20	11th "	"	"	3	"	1
21	11th "	"	"	3	"	2
22	11th "	Female	"	3	"	1
23	11th "	Male	"	3	"	1
24	11th "	Female	"	3	"	1
25	11th "	Male	Primary	3	"	2
26	13th "	Female	"	2	"	2
27	13th "	"	"	3	"	3
28	13th "	Male	"	"	"	"

1	2	3	4	5	6	Unsuccessful.	Unknown.
13	5	9	..	1	..	..	..
Hassain Buksh, Vaccinator, Simla.							

Third Calf vaccinated on 11th June 1891.

Lymph taken 19th June 1891.

No.	Month and date.	Male or female.	Primary or secondary.	Number of points of insertion.	Successful or unsuccessful.	How many successful points of insertion.
1	21st July 1891	Male	Primary	3	Successful	3
2	21st "	"	Secondary	3	"	2
3	21st "	"	Primary	3	"	3
4	21st "	"	Secondary	3	"	1
5	21st "	Female	"	3	"	2
6	21st "	"	"	3	"	1
7	21st "	Male	"	3	"	3
8	21st "	"	"	3	"	2
9	21st "	Female	"	3	"	3
10	21st "	Male	Primary	6	"	2
11	21st "	"	Secondary	3	Unsuccessful.	1
12	23rd June	"	"	3	Successful	1
13	23rd "	"	"	3	"	1
14	23rd "	Female	"	3	Unsuccessful.	2
15	23rd "	"	"	3	Successful	1
16	23rd "	"	"	3	"	2
17	23rd "	Male	"	3	"	1
18	23rd "	"	"	3	"	1
19	23rd "	Female	"	3	Unsuccessful.	6
20	23rd "	"	Primary	6	Successful	6
21	23rd "	"	Secondary	3	Unsuccessful.	1
22	23rd "	Male	"	3	Successful	1
23	23rd "	"	"	3	"	4
24	28th "	Female	Primary	4	Unsuccessful.	6
25	28th "	Male	Secondary	3	Successful	1
26	29th "	Female	Primary	6	"	1
27	29th "	"	"	2	"	1

1	2	3	4	5	6	Unsuccessful.	Unknown.
9	5	4	1	..	3	5	..
Hassain Buhah, Vaccinator, Simla							

ORDER—dated 3rd September 1891, No. 2128 L., Local and Municipal.

In the first of the Government Orders read above, Surgeon-Major King was directed to carry out certain experiments in connection with the method proposed by him of preserving animal lymph for vaccine purposes by means of lanoline. That officer was accordingly deputed on special duty for six months, and he commenced operations on the 15th November 1890. The papers read above contain the results of these experiments and the proposals of Surgeon-Major King relative to the introduction of a complete system of animal vaccination into this Presidency.

2. It seems from the facts and figures now reported, that the efficacy and trustworthiness of Dr. King's preparation have been somewhat overrated by him; but as a means of preserving and storing lymph for long periods in the Indian climate, it seems to be superior to any yet discovered and, as such, is unquestionably of great value. Compared, however, with animal lymph fresh from the calf, the results attained by it are distinctly inferior. It is true that want of special training on the part of vaccinators in the use of it may have operated to its disadvantage, but the same remark applies to the performance of all animal vaccine operations which are of comparatively recent introduction; and even in those localities where Dr. King's system has been longest in vogue and where it may be assumed to be worked with a maximum of care, the relative value of the two methods remains unchanged. The superior cheapness of Dr. King's system is undoubted, but this should not weigh against

superior efficiency. In these circumstances, His Excellency the Governor in Council is not prepared to approve the adoption of Dr. King's vaccine exclusively. Wherever possible, with a due regard to economy, fresh animal lymph should be employed in all vaccine operations for the future, and Dr. King's lanoline paste should be availed of only when the use of stored lymph cannot be avoided. The paste should in no case be made use of after the lapse of 21 days from its preparation, the date of which should be certified on the packet transmitting it. The use of humanized lymph should, at the same time, be entirely discontinued.

3. The arrangements for carrying out these orders will be worked out in detail by the Sanitary Commissioner. The proposed establishment of a vaccine institute, dairy farm, &c., will, under the circumstances, be unnecessary, and His Excellency the Governor in Council is of opinion that, if the demand for lanoline-vaccine should be large, several factories for its preparation should be established in convenient parts of the Presidency, the working of these institutions being entrusted to selected and specially-trained Assistant Surgeons. The price of the vaccine so prepared, should be fixed by the Sanitary Commissioner with reference to the cost of producing it, and the value will be recoverable from the local bodies concerned. Special postal rates for its transmission are out of the question.

4. The total amount of Dr. King's expenditure while on special duty should be reported, and sanction for the same will then be accorded in the Financial Department.

5. As regards the use of the scarificator in vaccine operations, there appears to be no reason to interdict it, if the implement is required for the successful employment of lanoline paste. The principal objection seems to be the difficulty of keeping it clean, which is probably overrated.

6. The reorganization of the vaccination department should now be considered by the Sanitary Commissioner with reference to the observations made above; Dr. King's special report on this subject called for in G.O., dated 12th January 1891, No. 61 L., paragraph 4, is awaited.

7. His Excellency the Governor in Council appreciates the energy, skill and resource displayed by Dr. King in the prosecution of his special duty.

(True Extract.)

W. H. French

Chief Secretary.

To the Sanitary Commissioner for Madras.
 „ Dr. King, through the Surgeon-General.
 „ the Surgeon-General of Madras.
 „ all Presidents, District Boards.
 „ all Chairmen, Municipal Councils,
 through the Collectors concerned.
 „ the President, Municipal Commission, Madras.
 „ the Agents to the Governor in Ganjam, Vizagapatam and Godavari.
 „ the Accountant-General.
 „ the Financial Department.
 „ the Public Department.
 „ the Revenue Department.
 „ the Military Department.

Exd. W. H. French.

2793

Gobt. of {1891} Madras.
LOCAL AND MUNICIPAL.

Order 25th Sept. 91 No 835

Recorded.

*F.O.B.
for C.S.
25/9*



Issued

Recd. 24/9

Encl.

G.O., 3rd Sept. 1891, No. 2128 L.

SEPTEMBER.

Animal lymph.

Passing orders on the final report by Surgeon-
Major King on the lanoline-vaccine scheme.

WFFH OP