

customs, their meagre income can afford but a small surplus over the necessary expenditure.

As a whole, such a people, however thrifty, can do little more than live, consuming the commonest and coarsest qualities of grain, and that even in no too great abundance. It means food defective in quality and quantity, and a general lowered standard of health, with a proclivity to disease, and no reserve force to meet the calls of severe illness. Exposed always to the blighting effects of malaria, and of unwholesome surroundings, and ill-nourished, they are a listless apathetic race with no go in them. They grow prematurely old. Insufficiently nourished mothers produce weakly infants, amongst whom in the healthiest years the mortality is abnormally high,* and whose first years are a very struggle for existence. What wonder that in a year of epidemic, such as 1884, more than three-quarters of those under one year, and one-half of those under five years were swept away. Taken at its best Deobund is an unhealthy place, as the death-rates for the last nine years show:—

Year	Death-rate	60-78	Per cent.
1878		75.56	"
1879	"	52.48	"
1880	"	52.59	"
1881	"	43.12	"
1882	"	41.82	"
1883	"	139.17	"
1884	"	69.64	"
1885	"	48.28	"
1886	"		"

They arise from centuries of disintegration and ruin of houses and huts. The native builds, he rarely or never repairs. A house is deserted, destroyed by fire, or otherwise goes to ruin; a new one is raised on the spot without any attempt to clear away *débris*.

(To be continued.)

ON SUCCESSFUL VACCINATION IN THE PLAINS DURING THE HOT SEASON.

BY SURGEON P. MULVANY, *Medical Staff*.

VACCINIA has been described as a specific disease due to a specific virus—a disease unnatural to man, and consequently it is stated that the virus degenerates by successive human transmission, even when the utmost care is taken in the selection of the subject who furnishes the supply of lymph. Jenner and some continental writers have recommended that recourse should be had anew to the cow as frequently as possible in order to prevent its

* The following figures show that the deaths of infants are always high:—

Year	Total births	974	Deaths under one year	392
1880		1111	"	419
1881	"	921	"	395
1882	"	1001	"	304
1883	"	857	"	687
1884	"	654	"	256
1885	"	667	"	182
1886	"		"	

deterioration or loss of power. Many observers have noted the influence of atmospheric temperature upon the success and course of vaccination. Thus, in a report of the Central Committee of the French Academy, one physician vaccinated twelve infants in the middle of the day when the heat was very great, and not one of them developed the disease; in the evening when it was cooler, however, he vaccinated twelve more, and, although he used lymph from the same source, the vaccination was followed by complete success. Another physician was obliged to vaccinate twenty or thirty subjects when the heat was very great, in order to get two or three vesicles. Dr. Duncan Stewart, Bengal, thus described the effects of temperature. "The vesicles became extremely minute, the surrounding induration small, the areola diffused and ill-defined." Dr. McLennan, Bombay, wrote:—"The deterioration invariably occurred in the hot months of April, May, and June. In the hot weather the proportion of failures was very great." The Superintending Surgeon of Bombay noticed at Mahableswar, "that during four months of the hot weather, it was impracticable to carry on vaccination."

In a Circular Memorandum No. 12, dated 9th June, 1884, Deputy Surgeon-General H. W. Bellew, C.S.I., Sanitary Commissioner, Punjab, informed all Civil Surgeons in the Punjab:—"That the working season in the plains is usually from 1st October to 31st March, but that Civil Surgeons were at liberty to continue till April or till such time as the weather prevents. The Deputy Sanitary Commissioner, Punjab, states "that, after the 31st March, when the weather becomes very warm, excessive inflammation (and sometimes sloughing) at the site of the vesicles is apt to occur." As much that has been written on the subject does not coincide with what I have lately experienced, the results obtained by me during the season of 1886 and 1887 are worthy of publication.

(1) Because they differ considerably from the views generally expressed, and

(2) As a guide to other medical officers who may be similarly circumstanced when an epidemic of small-pox makes its appearance in the hot weather in the plains. As Staff Surgeon of Meean Meer I obtained, on 1st October 1886, three tubes of vaccine from the Deputy Sanitary Commissioner, Punjab, for the purpose of commencing operations in this station. Two of these failed. With the third I succeeded in propagating two large and perfect vesicles on a native child. From this child two others were vaccinated, some lymph was collected on glasses, and thus a commencement was made. The virus was transmitted by successive human generations without renewal until 835 persons were vaccinated, as shown in the following table:

TABLE I.—Giving particulars of Vaccinations performed in Meean Meer Cantonments from 1st October 1886 to 31st March 1887.

1 Population according to census of 1881.	2 Total number of persons vaccinated.			3 Primary Vaccination.					4 Re-vaccinations.				5 Percentages of successful vaccinations excluding those unknown from the total.	
	Males.	Females.	Total.	Successful.			Unsuccessful.	Unknown.	Total.	Successful.	Unsuccessful.	Unknown.	Primary.	Revaccination.
				Total of all ages.	Under one year.	Over one year and under six.								
16553	525	310	835	676	175	450	39	12	159	131	24	4	94·12	84·51

Small-pox was epidemic in the bazar during the cold season of 1886 and 1887, and some casual cases occurred among the followers in cantonments. It was evidently spreading, and active measures were needed to protect all those who were unvaccinated in the station. On 29th April, 1887, a case occurred in the Station Hospital. Private J. H., 2nd Northumberland Fusiliers, age 22, had been vaccinated in infancy and re-vaccinated in 1882; had doubtful marks of re-vaccination on arm; was admitted for gonorrhœa nineteen days previously, and for which he was under treatment when the disease developed itself. The source of the contagion was traced to the son of the Hospital Jemadar Dhubie (head-washer), who was ascertained to be suffering from small-pox at that time, and it is consequently remarkable that the outbreak was so limited. A second case occurred in barracks on the 15th May. Mrs. A. H., lately arrived from England, had been only three weeks in Meean Meer, when the disease made its appearance in a most aggravated confluent form; she had never been vaccinated. A third case occurred on 17th May. Private H. S., had not been vaccinated in infancy; was vaccinated in 1882 as shown by his M. H. sheet; result, failed. In neither of the two latter cases was there any unusual exposure to the contagion, showing that the virus was more or less extensively diffused. All these cases recovered. All the British troops in the garrison were immediately inspected with their wives and families, and action taken for their re-vaccination. It was found that 105 of all ages were unprotected. Some had satisfactory marks of vaccination performed from 5 to 8 years previously, some had doubtful marks, and some had none. Some children of followers (21) were also vaccinated in order to keep up an abundant supply of lymph:—

TABLE II.—Showing the result of adult vaccinations performed during the months of April, May, and June, 1887, in Meean Meer.

	Total.	Perfect.	Modified.	Failed.	Percentage of successes.
British Troops, Meean Meer ...	95	49	27	19	80

TABLE III.—The above-mentioned vaccinations being classified according to the marks of previous vaccination: the results are as follows:

Degree of success of Vaccination.	Of cases with good cicatrices of vaccination there were 62, and among these, results were per 100.	Of cases with doubtful cicatrices of vaccination there were 21, and among these, results were per 100.	Of cases with no cicatrices of vaccination or small-pox there were 12, and among these, results were per 100.
Perfect ...	50	57·14	50
Modified ...	20·97	33·33	50
Failed ...	29·03	9·54	...

TABLE IV.—Showing the result of primary vaccinations performed in Meean Meer during April, May, and June, 1887.

Total number of vaccinations.	SUCCESSFUL.			Percentage of successful.	REMARKS.
	Under one year.	Over one and under six.	Total.		
Europeans ... 10	} 11	20	31	100	One child suffering from congenital syphilis and one from a chronic skin disease developed minute vesicles, and were not vaccinated from—Lymph from the original source was used.
Eurasians ... 1					
Natives ... 20					
Total ... 31					

The operation was performed in every case directly from arm to arm which tended, in my opinion, very much to its success, and care was taken in the selection of the pock. I think the operator ought never to have it out of his mind that the object in vaccination is to produce a real and absolute disease, and no precaution should be regarded as too minute and trifling which is calculated to ensure the perfect attainment of this end. He should remember that the vaccine disease is one which is not natural to man; that it is planted upon a soil to which it is foreign; and that it requires constant watchfulness and judicious cultivation to restrain its inherent disposition to deterioration. The subject from which the lymph is taken should be robust, not weakly and cachectic; the pock selected should be perfect in its character, and the lymph should be taken at a period prior to the appearance of the areola; not more than six persons should be vaccinated from one child. I operated on batches, on five different dates during April, May, and June, according as abundance of fresh lymph was available; bearing in mind that one success was better than twenty failures. I ascertained by comparison that the virus was most active on the morning of the 8th day. The temperature in the verandah, where the operations were performed, averaged 106°. The air at the time was dry and harsh. In no instance was there excessive irritation, inflammation, or sloughing. The vesicles were all well developed, areola large and firm, and in twelve cases, among the men, the axillary glands were slightly affected. What I wish particularly to point out is the activity of the virus after numerous transmissions of human generation without renewal, and the unusual success which attended the operations during the hot weather in the plains, to which I attribute the speedy arrest in the march of small-pox through the British troops composing the Garrison of Meean Meer.

SUMMARY.

1. That the vaccine virus, if carefully and judiciously cultivated, does not degenerate by successive human transmissions.
2. That the vaccine virus is as active in the plains during the months of April, May, and June, as during the cold weather.
3. That much of the success depends upon the operator and the selection of the pock.
4. That there is no danger of excessive irritation or sloughing at the site of the vesicles.
5. That failure is due to the use of lymph from exhausted vesicles, (I have seen 57 persons vaccinated on one occasion from one arm) to dry and decomposed lymph or to the carelessness of the operator.

SOME INTERESTING AND PECULIAR CASES AT POONAMALLEE, MADRAS, FROM 1883—1885.

BY SURGEON JOHN D. T. RECKETT, M. S.

(Continued from page 233.)

CASE V.—*Phthisis—Pleuritic effusion—Aspiration—Recovery.*

May 31st, 1884.—Sergeant Charles W.—sent from Bangalore for hepatitis contracted at Secunderabad. No mention is made of the diseased condition of right lung, which, at the present time, is extensively affected.

There is considerable dulness over the base and apex, increased vocal fremitus, expectoration of thick purulent sputa, anæmia and much emaciation. Evening temperature ranges from 100° to 103°. Cough troublesome and much dyspnoea.

Treatment.—Rest and ordered Amm. chloride gr. 20, *ter die*. He continued to take this drug for nearly a month, and was then ordered Ferri et quin. cit. gr. 5, *ter die*. Hot linseed poultices to chest.

June 27th, 1884.—More reduced and dyspnoea more troublesome. To have Ammon. carb., Vin. ipecac., and Tinct. scillæ, and continue poultices. Diet to consist of beeftea, with milk, and 6 oz. of tarragona daily.

July 1st, 1884.—In the night he complained of a tearing pain in right side, and on examination there is hyper-resonance all over the lower part of right lung, indicating emphysema, great dyspnoea. Moist rales all over the left lung. Hot linseed poultices every three hours.

July 5th, 1884.—Chest measurement: Right—at level of nipples—18 inches. Left—at level of nipples—16½ inches. Free expectoration of viscid sputa.

July 13th, 1884.—Dulness at lower part of right chest very pronounced, but there is resonance above. Says he feels a splashing on rising suddenly from the recumbent position. Distinct metallic tinkling heard over 6th, 7th, and 8th ribs, and particularly when he shakes himself from side to side.

August 5th, 1884.—There is bulging of right intercostal spaces and complete dulness from nipple downwards. No vocal fremitus and no respiratory murmur lower than 6th rib. To have full diet with 1 pint of claret.

September 24th, 1884.—The signs of accumulation of fluid continue in spite of diuretics and blisters. Accordingly, the chest was aspirated between 5th and 6th ribs, and 28 ounces of fluid (straw coloured) drawn off.

September 28th, 1884.—Much easier, but there is still a considerable amount of air and fluid in pleural cavity. To take Syr. ferri iodid. and cod oil. He is taking half diet with a bottle of Bass's beer, and some eggs for breakfast.