

## SMALL POX, VACCINATION AND THE NEW VACCINATION LAW IN SIAM.

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A paper read before the Siam Society, Bangkok, on the 28th May 1914, by H. Campbell Highet, M. D., D. P. H., Principal Medical Officer, Local Government, Siam, and Vice-President, Siam Society.

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Some of you may still remember that at the Seventh International Congress of Hygiene and Demography which was held at London in August 1891, His Majesty King Edward VII. of England, then Prince of Wales, struck the keynote of Preventive Medicine when, in his address as President of the Congress, referring to Tuberculosis, he enunciated the memorable dictum, "If preventible, then why not prevented?"

In this short sentence the future ruler of his people defined the duty of every administration which has the welfare of its people at heart. Once science had shewn the methods by which disease might be prevented, it is evident that the Prince of Wales considered it incumbent upon the Government to put these methods into practice.

Other Sovereigns have, however, been equally anxious that their people should benefit from the discoveries of Medical Science, and, as I hope to show you, the present occupant of the throne of Siam and His three Royal Predecessors have not been slow to apply the memorable discovery of Jenner to the prevention of Small Pox in Siam. The latest phase in the struggle against this devastating disease is the promulgation on the 19th February B. S. 2456 (1914) of the Vaccination Law which enforces compulsory vaccination upon all those persons who reside within the

Province of Bangkok. This date forms a landmark in the history of preventive medicine in Siam, and not only the present generation but countless thousands yet unborn will live to bless the memory of His Majesty King Vajiravudh for promulgating this law, and also for providing the means of applying its blessings free of charge to his people.

Before explaining to you the main principles of this epoch-making Law, I wish to say a few words with reference to Small Pox in Siam, to the introduction and early history of Vaccination in this country and to the more recent preparations which had to be made before Compulsory Vaccination could be introduced.

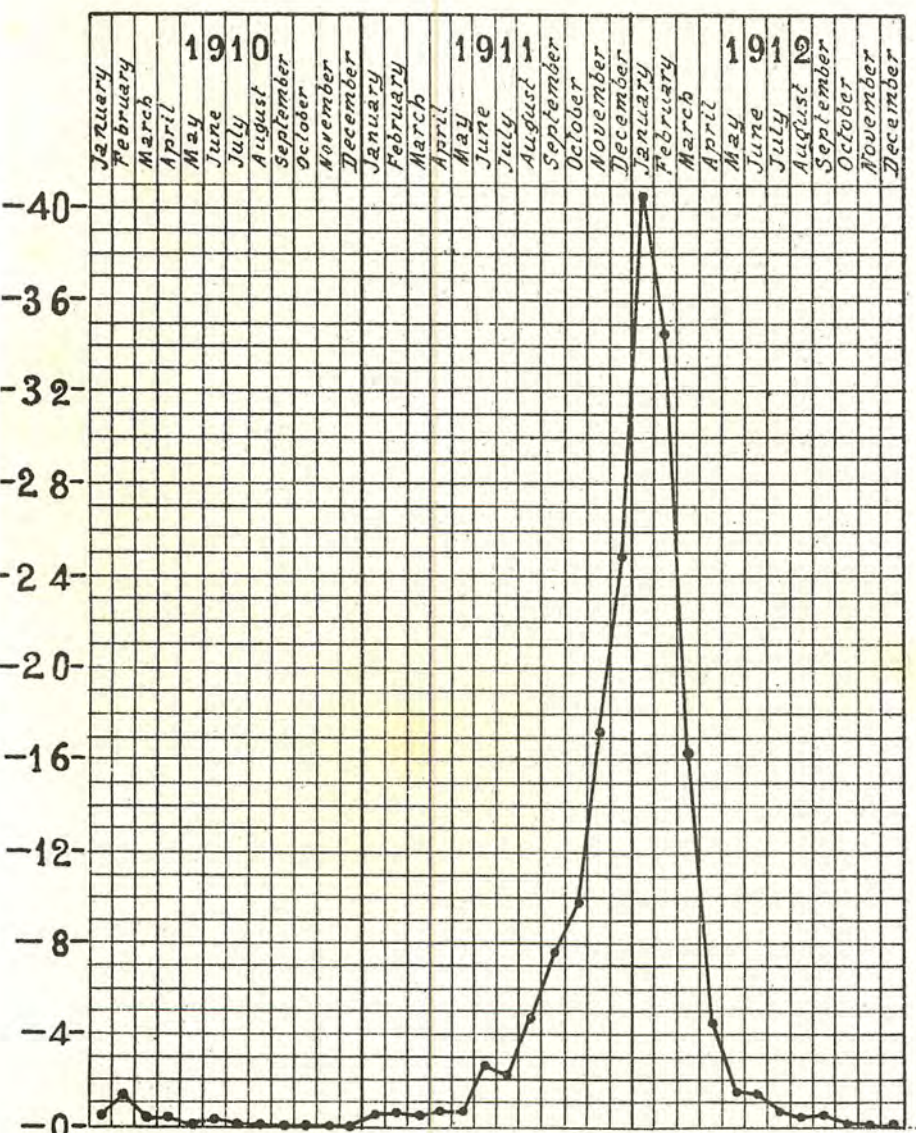
### Small Pox in Siam.

Throughout Siam, as in most other Eastern countries which are not yet sufficiently protected by vaccination, Small Pox is endemic; and from time to time takes on an epidemic form. Amongst the Siamese the disease has two names, the classic name being "Kai dara pit" meaning the fever of a very harmful nature, while the vulgar title is "fi dat," the disease characterised by the eruption of boils all over the body. There are no records which show when Small Pox first came to this country.

In Bangkok it would seem that there is a fairly regular cycle of epidemicity. Every three or four years the disease becomes epidemic, persists for a few months, and dies down again for another two or three years. Chart I. shows in a striking fashion the natural evolution of such an epidemic. As will be seen from this chart, the disease was in almost complete abeyance during 1910, there having been an epidemic during 1908-1909. During 1911 cases began to be reported as early as January, but the disease smouldered on until August, when the curve is seen to rise steadily to a maximum in January 1912. The fall was rapid during the next few months, and by May only three deaths from small pox were reported. From June to September only one or two deaths were reported monthly and then no more until the end of the year. During the year 1913, there were only a very few cases. We have here an excellent illustration of the natural Small Pox cycle in an unvaccinated population. Although over twenty-five thousand persons were vaccinated by officers of the health department during the months of November and

*D. Hight on "Small Pox, Vaccination  
and the New Vaccination Law in Siam"*

*CHART-I-*

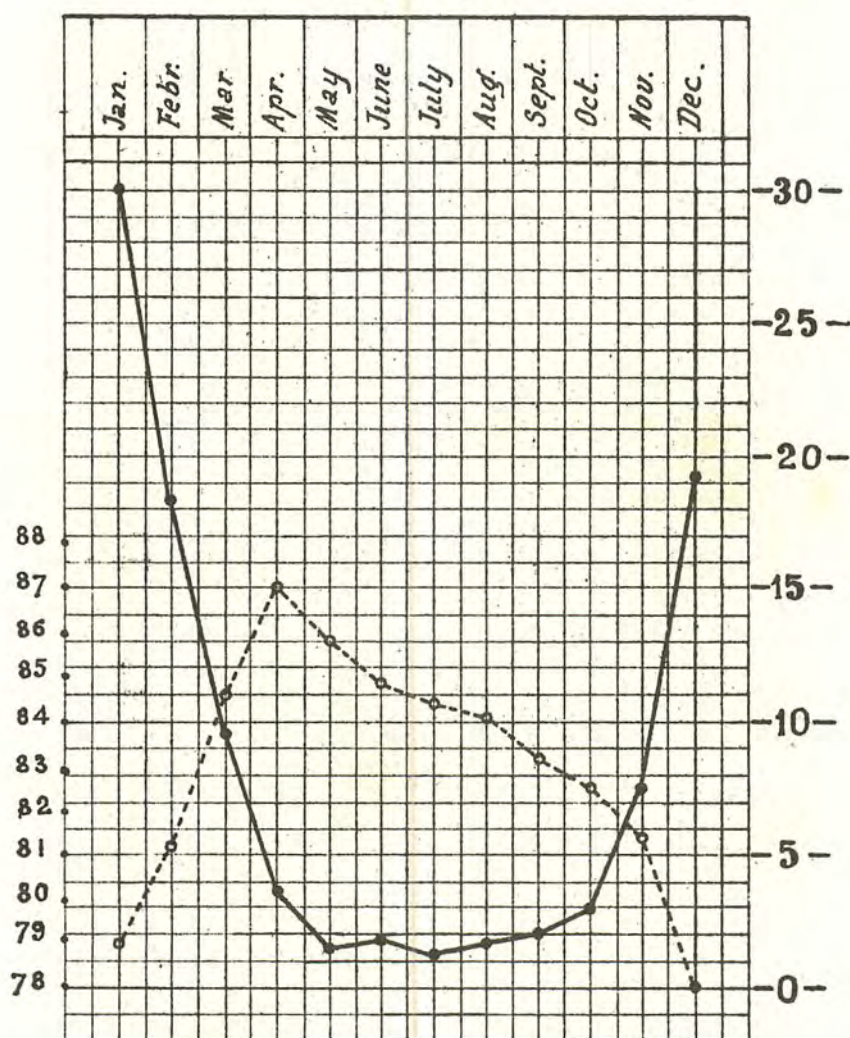


*Monthly Death-Rate from Small-Pox  
shown as a Percentage of the total Deaths  
from all causes Month by Month in Bangkok,*



*D<sup>r</sup>. Hight on "Small Pox, Vaccination  
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*CHART-II-*



*— Plain lines show Monthly Death-rate in Bangkok from Small-Pox calculated in Percentages of a total of 2594 deaths during three years.*

*Interrupted lines show the mean atmospheric temperature in Bangkok in degrees Fahrenheit*



December, 1911, and January and February, 1912, and cases of small pox became less frequent thereafter, this small number of vaccinations among such a large population had in my opinion very little influence upon this epidemic. The real reason for the decline was no doubt the fact that most of the susceptible individuals had either died of the disease or were rendered immune by an attack from which they had recovered. The result was a population with a high degree of immunity, but as is self-evident this immunity begins to lessen as soon as the epidemic is over. Infants are born and are not protected by vaccination, or unvaccinated infants and adults migrate into the city, and in the course of two or three years the population is again a susceptible one. Now it happens that the introduction of a case of small pox is like the application of a light to a fuse. The ordinary inhabitant of Bangkok does not seem to fear small pox and certainly is entirely oblivious to the danger either of personal infection or of carrying infection to others. Friends and relatives crowd around a small pox case, assist perhaps in nursing and never think of changing their clothing or disinfecting themselves in any way after having been in contact with a case. One has often seen the patient himself mixing freely with the public in the street or market while yet in a state of desquamation. As infection thus spreads from the early cases the circle widens and a steady rise in the death rate is the result, as may be seen on the chart, until during the cooler months of the year the explosion occurs in the shape of a severe epidemic.

*The Seasonal Incidence of Small Pox* is shown by Chart II. Thirty per cent of the cases occur during January and nineteen per cent. during December—the coolest months of the year in Bangkok.

*The General Death Rate from Small Pox* cannot be given in the absence of any knowledge of the number of cases which recovered but of 379 cases under observation in the Hospital for Infectious Diseases 211 died, giving a death-rate of 55.9 per cent.

During the epidemic of 1911-12 the total deaths from Small Pox amounted to 2,368, equal to a mortality of 4.3 per thousand of the population, amounting to 540,679 according to the late census. (Sept. 1909).

*The Age at Death* in the above cases is given in the following table, which confirms the view that the population of Bangkok is not yet sufficiently protected by vaccination.

### Ages at Death from Small Pox.

AGE.	Sex.		Total.	Rate per cent.
	Male.	Female.		
Under 3 months ...	34	32	66	2.7
3 months to 1 year...	277	293	570	24.0
1 to 5 years ...	367	349	716	30.2
5 „ 10 „ ...	120	125	245	10.3
10 „ 20 „ ...	222	132	354	15.0
20 „ 25 „ ...	142	64	206	8.7
25 „ 35 „ ...	125	48	173	7.3
35 „ 45 „ ...	20	6	26	1.0
45 „ 55 „ ...	6	1	7	0.5
55 „ 75 „ ...	0	1	1	
Unknown ...	3	1	4	
	1,316	1,052	2,368	

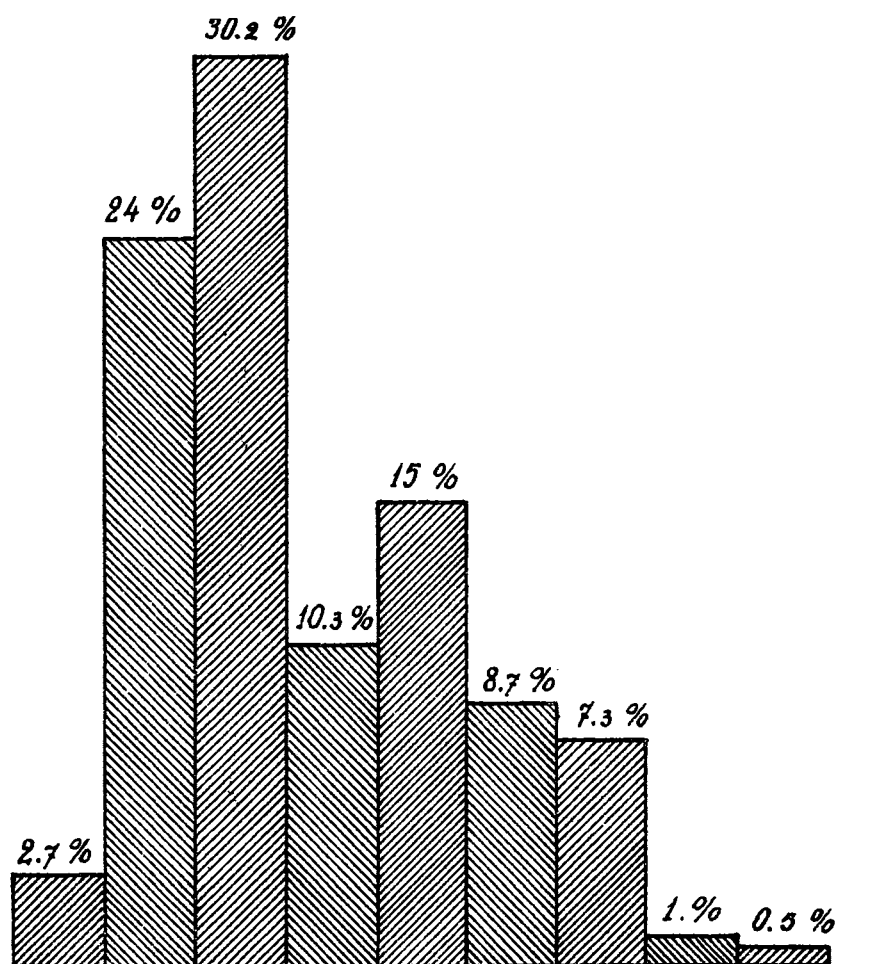
We note then that more than a quarter of these deaths were in infants under one year of age and that 67.2 per cent were in children under 10 years of age, a sure indication that vaccination has not been carried out sufficiently in Bangkok. The diagram shows the proportions very clearly.

### Methods of prevention against Small Pox in Siam.

Although I have just demonstrated the fact that vaccination is not carried out sufficiently in Bangkok, it must be remembered that vaccination is popular with the Siamese and has been so since its introduction in January 1840. There are no "conscientious objectors,"

*D<sup>r</sup> Hight on "Small Pox, Vaccination  
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*CHART-III-*



Under	3 Months	1	6	11	21	26	36	46
3	to	to	to	to	to	to	to	and
Months	1 Year	5	10	20	25	35	45	upwards
Years								

*Percentage of Small-Pox Deaths  
at Different Age Periods*



and whenever and wherever a vaccinating officer is at work the people readily submit themselves or their children to vaccination.

In the absence of vaccine lymph inoculation is still said to be practised freely in the interior.

The honour of first introducing Inoculation and later on Vaccination into Siam is due to the American Missionaries.

### Inoculation against Small Pox in Siam.

As the history of these two movements is of some considerable interest, I may be pardoned if I give here a few historical details. In this respect I cannot do better than quote the words of one of the principal actors in the movement—the late Dr. Bradley—the well known American Missionary and Editor of the “Bangkok Calendar.” In an article entitled “Inoculation for Small Pox,” published in the “Bangkok Calendar” of 1865, Dr. Bradley writes as follows:—

#### “Inoculation in Siam.”

“There was once a very extraordinary waking up of the Siamese mind to do something to modify the virulence of small pox. It took place in the latter part of A. D. 1838. That annual scourge was unusually widespread and malignant at that time. Great efforts had been made by the missionaries every year for the four previous years to introduce vaccination, but all in vain. Being surrounded by the small pox, with scarcely any hope of shutting it out from their own families, they then felt constrained, by the providence of God, to endeavour to save their children by inoculating them with the small pox. The blessing of the Lord made it a complete success, every one of the subjects of the experiment having taken the modified small pox in the mildest form. His late Majesty the King of Siam, being informed of it, sent a body of the Royal medical faculty to the missionary physician to enquire into the matter, and then make to him a full report of their investigations. It was a very novel and exciting event for those early years of Protestant Missions, to be visited by such a Committee, from such a monarch. Those servants of the king were very particular and thorough in their enquiries, for they had a great charge in hand, and a stern master to serve.

" About that time, there was issued, from the Press of the  
 " A. B. C. F. M. in this city, a little tract in the Siamese language,  
 " setting forth the advantages of inoculating for small pox over having  
 " it the natural way, and the wisdom of the former course when the  
 " scourge is pressing fearfully upon one, and it is impossible to obtain  
 " the vaccine virus. A copy of this was sent to the king, and it was  
 " eagerly sought for and read by princes, lords, and the commoners.  
 " Presently ten or twelve royal physicians were ordered by the king to  
 " visit the missionary physician daily, for the purpose of seeing his  
 " practice in inoculating and treating the small pox thus modified and  
 " divested of its virulence, and in this way to qualify themselves for  
 " inoculating in the royal palace. Having faithfully studied the art  
 " a few days with praiseworthy proficiency, they were armed with  
 " lancets, and required to inoculate all that were unprotected in the  
 " palace of the king, and in the palaces of the princes, and in the  
 " families of the nobles and lords, and other officers of government, in  
 " the city and out of the city. Other native doctors were encouraged  
 " by the king to follow this royal example, who extended the work, it  
 " is believed, into many of the provinces of Siam.

" Inoculation was then the engrossing business and care, not  
 " only of nearly all the native physicians, but also of a large proportion  
 " of the better classes of the people, from the beginning of the year  
 " 1839 until the month of April. It is impossible to estimate the  
 " many thousands that were within that period inoculated; and it is  
 " very remarkable that amongst them all, there was not, probably, more  
 " than one case in five hundred that proved fatal, until the hot season  
 " was ushered in, when the work became so much less successful,  
 " that it was suspended.

" The king then evinced his high appreciation of the blessings  
 " of inoculation by presenting to each of the royal physicians, who had  
 " labored in the work, a purse of silver varying from eight to four  
 " hundred ticals, and to the missionary physician a purse of two  
 " hundred and forty ticals.

" So generally was inoculation accounted a perfect success, that  
 " those who had been waked up and blessed by it, wished for nothing  
 " better to take its place; and consequently it became subsequently an  
 " obstacle to the introduction of vaccination; because it was regarded  
 " as almost as safe, and always a more certain protection against small  
 " pox in the natural way, than vaccination."

“Inoculation was not without its dangers, however, and when vaccination came into vogue, inoculation was abandoned for a safe method of prevention.”

## Vaccination in Siam.

As has been already seen, the introduction of vaccination had been attempted for several years previous to the adoption of inoculation, but it was not until the middle of January 1840 that the first active vaccine scabs were brought to Siam by an American Missionary from Boston U. S. A. via the Cape of Good Hope. On the arrival of the vaccine scabs great difficulty was experienced in obtaining subjects for vaccination, but fortunately the then Prime Minister—Somdej Ong Yai—came to the rescue. He placed seventy-five children at the disposal of the missionaries and out of a total of 450 insertions, three or four good pustules were found on the 6th day. From these vaccine was propagated and over a hundred persons were vaccinated, but at the end of three months, the virus lost its efficiency.

In November 1842 small pox again appeared in an epidemic form, and the following quotation from Doctor Bradley's paper shows the great difficulties which the missionaries had to contend against in their campaign against Small Pox :—

“Failing to procure vaccine virus from abroad, they then made great efforts to procure it from the cow, by inoculating many of them with the small pox. His late Majesty, Phra Bat Somdej Phra Nang Klow, having been memorialized by them on the subject of vaccination, kindly offered them all the cows they might need for the experiment, going so far even, as to propose to have them transported by ferry boats to the west side of the river, where the missionaries were living, if they should prefer it. While the missionary physician was experimenting on the dugs of the cows, his own infant daughter, aged seven months, took the small pox in the natural way and, after nineteen days of terrible suffering, died with the lockjaw. It was only the evening before the day on which he discovered that his babe had been seized by the scourge, that he made up his mind that he must inoculate her and all the infant children of the missionaries, to save them from the virulence of the destroyer. While he was too late for the former, he was in good time for the latter, who all had the inoculated small pox in a mild

“ form excepting one who died of erysipelas, a sequence of the  
“ disease.

“ Vaccination was resuscitated August 1844 from scabs which  
“ were sent from Boston. U. S., overland, being enveloped in a little  
“ bees-wax. It was propagated with unusual energy and thoroughness  
“ by the mission of the A. B. C. F. M. from that time onward for a  
“ period of about ten months, when the work was again stopped for the  
“ want of fresh virus from the pustules of living subjects. About  
“ one thousand three hundred persons were thoroughly vaccinated  
“ during that period out of about two thousand subjects experimented  
“ upon.

“ After an interval of a year or more, the blessing was again  
“ brought back through the influence of an American friend sending  
“ the virus overland as before ; and thus it came and departed, with  
“ intervals varying from one year to two, until Dr. Campbell, R.N.,  
“ F.R.G.S.L., in giving to it more thorough attention at all times, for  
“ a period of five or six years, has kept it with us much the greater  
“ part of the time, and has done great good by it. It is now a settled  
“ blessing, not only to the families of all European and American  
“ residents of Bangkok, but also to the Siamese in general, among  
“ whom it is slowly winning, week by week, a wider range of  
“ confidence and usefulness.”

It was not until the year 1904, that the Siamese Government undertook the preparation of calf lymph in Bangkok. A Vaccine Laboratory was then opened at Si Kak Phya Sri by the Hospital Department, and large quantities of calf lymph were supplied to the public. It was soon found that more commodious premises were required and a Serum and Vaccine Laboratory was installed at Phrapatom and work was commenced there in August 1906 ( Siamese Era R. S. 125 ).

Considering the fact that vaccination was first introduced into the country by Americans, it is peculiarly appropriate that the Vaccine Laboratory at Phrapatom should have been started by an American—Doctor Paul Wooley—and that on his retirement, he should have been replaced by another American Graduate—Doctor Edwards. The United States of America deserve all honour for the splendid work which their sons have done in the cause of vaccination in Siam.

During the year 1912 the Vaccine Laboratory was merged in the Pasteur Institute under the immediate supervision of Doctors Manaud and Robert—both of whom have been trained in the Pasteur Institute at Paris. During the past seven years 1,890,596 doses of vaccine lymph have been issued to the public and still Small Pox continues to levy a heavy toll upon the population and more especially upon the infants of Siam.

When examining recruits for the police, I have for some years past noted their condition with regard to vaccination or the presence of small pox scars and in a total of over one thousand young adults examined, the following data have been obtained:—

Scars of small pox in 10%

Vaccinated and no scars of small pox in 60%

Neither vaccinated nor had small pox in 30%

It has long been evident therefore that the present voluntary system of vaccination is quite inadequate as a protection against epidemics of Small Pox, but before a law for Compulsory Vaccination could be enacted certain necessary preliminary steps had to be taken.

The establishment of a Vaccine Laboratory was the *first step*, and, as we have already seen, this has been an unqualified success. *The next step* was the training of a sufficient number of vaccinators. For several years past suitable young men have undergone a course of instruction with regard to small pox, the effects of vaccination and the methods of vaccination. In this work the medical officers of the Ministry of Interior and of the Local Sanitary Department have not been idle. Praise is specially due to Phya Pitsanoo, who, assisted by a small subsidy from the Local Sanitary Department, has turned out for examination some twenty to thirty young vaccinators every year. These have been examined by myself or my deputy, and certificates have been granted only to those who have shown reasonable proficiency and knowledge. In addition to these all our Sanitary Inspectors are trained in the art of vaccination.

*A third step* was to accustom the public to regular vaccination every year. In order to carry this out a beginning was made seven

years ago in Bangkok. Temporary vaccination stations were established by the Local Sanitary Department in hospitals, temples and police stations throughout the city. These were kept open during the cooler months of the year, which is the season most preferred by Siamese for vaccination. On the first occasion 3,620 vaccinations were performed. Every year since then free vaccination has been provided not only in Bangkok but also in the outlying suburbs and in the Muangs of the Bangkok Monthon. During the past seven years, a total of 80,934 vaccinations has been performed by officers of the Local Sanitary Department alone.

In the other Monthons of Siam—those under the Ministry of Interior—vaccination has also been carried out on a large scale. During the past twelve months a special vaccination campaign has been carried out in the Interior at the instigation of His Majesty the King, who has most generously defrayed all the expenses out of His Majesty's own purse.

Up to the 13th April of this year this special campaign has resulted in 304,938 vaccinations during the twelve months. So far then as the present generation is concerned it may be said that the population of Siam is fairly well protected against Small Pox. People in the distant parts of the Interior who never heard of vaccination before will now be able to judge of its value when the next case of small pox develops in their midst. They are now accustomed to the operation and to the appearance of vaccinating officers in their district, so that the country may now be considered ready for the final step to which we have looked forward so long—i.e., A Compulsory Vaccination Act.

### The Vaccination Law of B. E. 2456.

On the 19th of February of the year B. E. 2456 (1914) His Majesty was graciously pleased to sanction the enactment of a Vaccination Law for Siam. The law was drafted by the Local Sanitary Department for application in the Bangkok Province, and was revised by His Royal Highness Krom Phra Damrong, Minister of Interior, so that it is now applicable to the whole of Siam. At present it will only apply to the Monthon of Bangkok, but at any time it may be proclaimed for other Monthons in the interior.

A few words may now be said with regard to the chief provisions of this Law. The basal idea is the desire to have every person now in the kingdom or who may enter the kingdom rendered immune to small pox. Therefore as soon as this law comes into force every person who has not previously been successfully vaccinated must become vaccinated, unless it can be shown by a certificate from a duly qualified Public Vaccinator that he or she is immune to vaccination. Immunity may mean that he or she has previously suffered from small pox or has been repeatedly vaccinated without a successful result.

Every parent or guardian of a child over one month old must take the earliest opportunity of having such child vaccinated. No definite time limit is laid down in the law—as for example during the first three, six or twelve months after birth—owing to the many difficulties which might be experienced under local conditions. It will be left to the Superintendent of Vaccination to make such arrangements as are necessary from time to time and to notify the time and place for vaccinations in any district. This will enable us to commence work during the cooler months of the year when vaccination is more popular in Siam. The origin of this preference is doubtless due to the fact that it was only in cool weather that vaccine lymph could be transported any appreciable distance when transport was slow and difficult. Nowadays, with railway communication, ice and thermos flasks, efficient vaccine lymph can be transported to almost every corner of the country at any time during the year. Past experience has shown us that if the lymph be active, vaccination takes very well during the hot weather, and gives no worse arms then during the cooler months. In the course of time, I have no doubt that vaccination will go on all the year round, but as I have shown above, the law is so drafted as to enable us to commence our work at the most popular time of the year. So far as the Pasteur Institute is concerned the time of the year would seem to be immaterial. I may say that I personally have used their lymph at all periods of the year with equally good results.

Another point of importance in the law is the provision that the vaccinated child must be brought back to the vaccinator on the 8th day after vaccination so that the result may be verified. This will enable us to repeat the vaccination when necessary and to check

the efficiency of the lymph and the capabilities of the vaccinator. Certificates showing the result of Vaccination will be granted, and it is hoped that in time these certificates will be looked upon as valuable documents to be retained by the parents as carefully as they are retained in many other countries where vaccination is compulsory. We look forward to the day when no child will be admitted as a scholar into any school whatever unless he can show a certificate of vaccination or of immunity from Small Pox.

In the case of adults it is hoped that the same rule will hold good for entrance into any of the public services, be they combatant or civil.

In some countries in Europe the vaccination certificate is one of the important documents which proves an individual's civil status in his own country; in fact I am told that he or she cannot be legally married without its production. Is it too much to expect that some day in Siam the Vaccination Certificate will carry the same importance?

One of the most important clauses in the law is Clause IX. This gives the Minister power to issue a public notice enforcing vaccination or revaccination upon all the inhabitants of a district or locality within a specified time.

Such power would only be taken in the possibility of Small Pox becoming epidemic in such district or locality. Such a clause will on such an occasion prove invaluable as a means of prevention.

The word "revaccination" has just been mentioned for the first time, and no doubt many of you will think that this is a grave omission in any modern Vaccination Law. Let me show you, however, that revaccination has not been forgotten.

In fact we have gone further than the framers of many other vaccination laws. Look at Clause V., which says that "every person "with the exception of children under the age of one month shall "submit to vaccination as often as may be required by the Minister "at such place and time as may be specified by him."

By reason of this clause, I hold that whenever deemed necessary a public notice may be issued by the Minister concerned, calling

upon all persons of a certain age to be revaccinated. It is well known that the immunity conferred by a primary vaccination begins to lose its effect in from 7 to 10 years, although a certain degree of immunity may remain throughout life. It is further well proven that revaccination at the age when the primary immunity is lessening will produce practically absolute immunity for the rest of life.

Therefore in many countries revaccination is enforced by law. No definite age for revaccination is prescribed by this law, but I live in hope that an addition will be made to it, definitely laying down that revaccination during the 9th year will be compulsory.

The usual clauses permitting of postponement of vaccination in case of sickness of the child are included in the law.

Public vaccination will be performed free of charge at such times and places as may be notified by the Superintendent of Vaccination. Any person may however apply to a public Vaccinator to perform vaccination at his residence, and in such case if the public Vaccinator is employed by the Government, a fee will be charged at a rate prescribed by the Minister. No restrictions are placed upon private medical practitioners as to time and place of vaccination and the fees to be charged. They will however require to take out licenses as public Vaccinators if they wish to have their certificates recognised, for in accordance with Clause XI. the certificate of a public Vaccinator shall be the legal proof of being vaccinated in accordance with the provisions of the Law. The reason for this is the necessity of protecting the public. No unqualified person will be recognised as a Public Vaccinator, and the lymph to be used must only be that which has been authorized by the Minister.

The dangerous practice of inoculating with small pox virus is now declared to be a criminal offence, and the offender will be liable to heavy penalties.

In conclusion, it may be stated the "Conscientious Objector" has not been recognised in this law.

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