A plea for the Amendment of the present Act relating to Vaccination in Scotland.

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PART 1.

PRIMARY VACCINATION.

On 24th August 1904 The Local Government Board for Scotland issued the following:-

Memorandum
as to
The Granting of Certificates
of
Successful Vaccination.

"In considering Reports made to them by Medical "Officers of Health regarding cases of Smallpox, the "Board have had their attention drawn to cases of "children (the majority of whom were under 5 years "of age) who presented no evidence whatever of suc- "cessful vaccination either in the presence of local "scars or in modification of the disease, although "said by the parents to have been vaccinated. Similar "cases have been observed in the course of inspection "of 'contacts'. Further inquiry led to the discovery "that in many such cases a certificate of successful "vaccination had been lodged with the Registrar. "After investigation of the circumstances under which "this occurred, the Board are satisfied that consider- "able laxity exists in the granting by medical prac- "titioners of such certificates, in respect that they "are/

"are not always founded on personal inspection of the "child after a sufficient interval and occasionally have "even been signed at the time of the operation, when "its result was unknown and when subsequent inspec- "tion would have disclosed failure.

"A practitioner who grants a certificate of suc- "cessful vaccination places himself in a very serious "position. The certificate bears that the operation "has been performed by the person who signs it and "that it has succeeded. If in either respect the cer- "tificate is false the signatory is liable to a crimi- "nal prosecution.

"The Court regards a certificate of vaccination "by a medical practitioner as a matter of public im- "portance. In the case of The Lord Advocate v Webster "27th September 1872, 45 Jur. 3. the judge pointed out "that a medical practitioner acting under the Vacci- "nation Act is a public officer with a public duty to "perform. 'The medical practitioner is, by that Act, " 'erected into an officer who is to serve the public, " 'and give a certificate of successful vaccination, " 'and that certificate is a permanent document entered " 'on a public register, and is equivalent to a clean " 'bill of health as regards the child. The charge " 'here is that the doctor granted certificates of " 'successful vaccination when he had not successfully " 'vaccinated the children and knew that he had not... " '.....This must be regarded as a serious violation " 'of public duty involving punishment'. The result of "the prosecution in that case was that the practitioner "who had granted certificates of successful vaccination "though the vaccination had not taken effect, was con- "victed/

"convicted and sentenced to four months imprisonment.

"The Board desire to make it publicly known that, "if in future any case of this nature come to their "knowledge, it will be their duty to report it to the "Crown with a view to proceedings being taken".

G. Falconer Stewart,

Secretary.

Local Government Board,

Edinburgh, 24th August 1904.

Notes on Memorandum.

This Memorandum raises one or two questions to which I would like to refer. I take them, not in the order in which they occur, but in the order in which they adapt themselves to the other parts of these notes.

In the first place it is of interest to note that the case quoted dates back to the year 1872 - i.e. thirty-two years previous to the date of issue of this Memorandum. It is also interesting to note that such practice still exists and has apparently existed during all that period, and might have gone on indefinitely had it not been for the occurrence of some cases of small-pox — how many, we have no means of knowing — in children. That is to say that there exists at present no means of discovering breaches of the law until it may be too late to apply a remedy. Things are allowed/

allowed to drift on until an outbreak of small-pox rudely awakens us from our slumbers and, for a time at least, an endeavour is then made to arouse the profession to a sense of their responsibility.

The next point occurs in connection with the remarks of the judge who pointed out that a medical practitioner acting under the Vaccination Act is a public officer with a public duty to perform. This is perfectly true and a condition of which the profession is painfully aware, as it is equally true that, so far as the Act is concerned, he is an Honorary Officer, no provision whatever being made to ensure payment of his fee, - except in the case of Poor Law Medical Officers who are paid by the Parochial Authorities. Thus while there is a serious responsibility attached to the discharge of their public duty there is no guarantee of payment such as exists under "The Infectious Diseases Notification Act", where the Local Authority are compelled to pay for each notification received. Yet both are a means to an end - to one and the same end - namely the prevention of infectious disease.

On the other hand, not only is there no guarantee of payment, but the only method the practitioner has of securing his fee, namely by withholding the certificate, is rendered illegal by Section 8. which contains the following definite obligation:- " Upon and "immediately after the successful vaccination of such "child the Medical Practitioner who shall have performed "the operation shall deliver to the Father or Mother of "such child, or to the person who shall have Care, "Nurture, or Custody of such child a certificate under "his hand .....that such child has been suc-

"cessfully/

"successfully vaccinated". Thus any person who desires to have his child vaccinated without any expense to himself whatever, either as a private individual or as a ratepayer, may do so at the expense of the medical profession by notifying the Registrar that his child has been successfully vaccinated, but that the medical practitioner has refused to grant him a certificate. If it is illegal to falsify a certificate it is none the less a breach of the law to withhold a certificate. This is no doubt a mere mercenary view to take of such a high office as that bestowed upon us by the Act; but why should the medical profession have placed upon them all manner of responsibilities without some commensurate return? Two words inserted into the Section would have rectified this, when it would have read thus. "Upon and immediately after payment of successful vaccination" &c. Such alteration would not have cost the Government anything and would have given the medical practitioner the opportunity of demanding his fee from those who <u>can</u> but <u>will not</u> pay.

The last point I wish to consider is

What is Successful Vaccination?

Naturally one turns for guidance to the Vaccination Act for a definition of this term. Here we find that while the words "Successful Vaccination" are used again and again no definition is afforded, and each medical practitioner is left to depend on his own interpretation for direction in the discharge of the responsibilities of his public duty under the Act.

During my term of office as Pupil Assistant to Dr. Chalmers, Medical Officer of Health for Glasgow, 1900-1901, it was my fortune to witness a very serious epidemic/

epidemic of smallpox, involving nearly 1000 cases. In dealing with these cases and the "contacts" associated with them, several thousands of vaccination marks came under my observation. I was very much struck by the varied appearance presented by them, each, I presume, indicating what to the operator was his interpretation of the term "successful vaccination". In many cases the definition must have been stretched to its utmost limit; anything from a single vesicle upwards (or from such as would leave a pin point scar) seemed good enough to sign a vaccination certificate on.

One case I remember in particular in this connection. It was that of an infant a few months old whose father had been removed to hospital suffering from smallpox. On the case being reported to us by the Epidemic Inspector in charge, we had considerable difficulty in persuading the mother to have the child vaccinated at once. At last she consented to have this done by her own medical attendant which we of course agreed to. On a subsequent visit it was found that the child had been taken to the family doctor, and had been, according to his interpretation of the Act, "successfully vaccinated". The arm had been inspected at the end of the week and a certificate duly signed and forwarded to the Registrar. One small pustule alone was visible on the arm. After a good deal of further persuasion and on threatening to have both mother and child removed to the smallpox reception house I was permitted to - shall I say - revaccinate her baby. On again visiting this case at the end of seven days the arm presented all the signs of a primary vaccination and did not seem to be in any way modified by the former attempt, though/

though only seven to ten days had elapsed between the first and second vaccination. If such a thing be possible during a smallpox epidemic, and in a case in such close contact with an infected person, what can we expect in years when no fear of smallpox exists? In the above case (also) could the first vaccination be termed "successful" within the meaning of the Act? Apparently in the opinion of the first practitioner it was so, and as he took the precaution of examining the arm at the end of the week and previous to his signing the certificate, he would have raised a very fine point in a court of law had this child, by accident, come under observation during a subsequent epidemic. I rather think that in a few years it would have been in the condition mentioned in the Memorandum as showing neither scar nor modification of the disease, if attacked. And yet his attempt could not be said to have been altogether unsuccessful; there was certainly some local reaction, but whether this was sufficient to pass muster under the Act, I do not care to speculate, as the Act gives me no assistance whatever in the solution.

The definition of "successful vaccination" is thus an extremely subtle question, and, for that reason, should, in my opinion, be deleted from the Act, or a definition be given in the same manner as words and terms are defined in the Public Health (Scotland) Act 1897 and in many others. Then and not till then will medical practitioners realise what is expected of them, and some uniformity of practice may result. At present, each vaccinator relies upon his own interpretation and acts accordingly, with the result that such cases as mentioned in the Memorandum can, and do, arise, and smallpox continues/

continues to figure yearly in our mortality returns.

The Local Government Board seem surprised that such a condition of things is possible; whereas the only cause for surprise is that they are not more numerous; and that it is only now and then they come under observation.

- Vaccination in private practice -

I have now had eight years experience of vaccination as performed in private practice both in England and in Scotland and I make bold to say that over 90 per cent of such cases of vaccination, while it may be sufficient to satisfy the operator as to signing a vaccination certificate, could not be said to be to any extent protective.

In this connection I quote Dr. Seaton's remarks on vaccination in the years 1860-4.

1/ "In the official inquiries in the course of which "the arms of nearly half a million vaccinated children "were examined, evidence was obtained of the great ex- "tent to which imperfect vaccination had hitherto pre- "vailed in England; taking the country throughout, not "more than one child in eight (12.5%) was found to be "so vaccinated as to have the highest degree of pro- "tection that vaccination is capable of affording; not "more than one in three (33.3%) could, on the most in- "dulgent estimate, be considered as well protected; "while in more than one in four (over 25%) the vacci- "nation has been of a very inferior kind indeed, re- "sulting in marks of an imperfect character, or in only "one or two marks of merely passable character".

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1. McVail: Vaccination Vindicated, page 35.

These words were written for an article in Reynold's System of Medicine published in 1870 and are as true of the Vaccination methods of to-day as they were of the practice of that time. Let us tabulate them thus:-

Very inferior	= 25.0 per cent
Well protected	= 33.3 " "
Efficient	= 12.5 " "

The following was the result of my examination of 231 occupants of a Common Lodging House in Coatbridge which was infected with smallpox towards the end of 1904.

Unvaccinated	4	=	1.73 per cent.
No marks visible	11	=	4.76 " "
1 Good Mark	72	=	31.17 " "
1 Bad Mark	50	=	21.64 " "
2 Good Marks	54	=	23.33 " "
2 Bad Marks	19	=	8.22 " "
3 Good Marks	16	=	6.92 " "
3 Bad Marks	2	=	.86 " "
4 Marks	3	=	1.29 " "

Taking now even 2 marks as representing "well protected", all below that would be comparable with the very inferior; and all above that would be comparable with the highest degree of protection (the efficient in the previous table), what do we find .

	1860-4	1904
Very Inferior	25.00	67.09
Well protected	33.3	35.93
Efficient	12.5	9.09

Thus Dr. Seaton's statement is an over-estimate rather than an under-estimate of the efficiency of vaccination under present day conditions. We have, in fact, as/

as regards vaccination, retrogressed rather than progressed in that interval.

Should a private practitioner insist upon putting even two marks of any size on an arm he will very soon find his number of vaccinations steadily diminishing, as another practitioner in the same town or district is content with one mark, and that by no means a large one. Consequently the first practitioner must either come down to the level of the other, or become a martyr for conscience sake — a by no means profitable position in the present keen competition in the profession. Besides, if the law as at present existing shows no respect for efficiency, but, on the other hand, permits of such divergency, why should the medical praetitioner take upon himself the gratuitous responsibility of rectifying its deficiencies?

The average working-class public knows nothing of Vaccination further than that, if a certificate be not forwarded to the local registrar within six months of the birth of the child, they are liable to prosecution. Their only anxiety, therefore, is to have such a certificate, and to obtain it with as little inconvenience to themselves as possible in the way of extra attention and nursing. Such people are, moreover, wholly unamenable to reason, and refuse to allow more than one mark to be made.

In the better artizan, and in the middle and upper, classes there are some who are willing to have their children properly vaccinated; these are, however, unfortunately in the minority, and are not the classes among whom smallpox is most prevalent. On the other hand these are the classes among whom the Antivaccinators/

Antivaccinators find their strongest supporters. Against the influence of such the medical profession does nothing at present in the way of counteracting the effects of the literature scattered broadcast among them. These people are capable of reading and thinking for themselves, but at present they have only one side presented to them, and consequently conclude that there is no other; in this they are encouraged by the literature just indicated.

Public Vaccination Most Efficient.

In my opinion the most efficiently vaccinated children are those who have the operation performed by the Vaccinators at the public stations in our large towns. Here four insertions are always made, and greater efficiency ensured; for, as I hope to show at a later stage, there exists a vast difference between successful and efficient vaccination.

That such a want of uniformity exists is certainly to be regretted, for, while the law compels all parents or guardians of children (in Scotland at least) to have them vaccinated, it does not compel them to have this done in the most efficient manner possible. Thus people are deluded into the idea that vaccination (as at present performed) affords great protection against Smallpox, only to find, perhaps, at some future time, that such protection is only applicable when the operation has been thoroughly and efficiently performed, and that consequently their child has been, to a great extent, excluded from the benefits so derived. We are at present, in fact, simply playing into the hands of the Antivaccinators who are by no means slow to take advantage of such a condition.

Need/

Need for Amendment of present Act.

How then are we to remedy the present unfortunate position of vaccination? By prosecution of the medical practitioner? I think not. It is not so much the method of vaccination which is to blame as the Act which permits such method to exist. Besides, alteration of the method is only possible by alteration of the conditions required by the Act. The Act should therefore be amended, and in the new Act the term "successful vaccination" be deleted in favour of "efficient vaccination," or be so defined as to render these two terms synonymous.

Control of Vaccination transferred to Public Health Authorities.

As before mentioned, vaccination is but a means of prevention of a particular infectious disease. All other infectious diseases and their prevention are under control of the Local Authority - Town or County Council. Thus under the proposed amended act, vaccination should be transferred from the Parochial to the Public Health Authority. The latter body have under them a permanent staff of Medical Officers, who, as a rule, have more experience of the value of efficient vaccination than Poor Law Medical Officers. They are therefore better qualified to supervise this matter.

As already indicated, also, provision should be made for the remuneration of the operator either by the parent or guardian of the child, or, preferably, by the Local Authority, as is done in the case of notification of infectious disease.

- Suggested Modification of Schedules -

The/

The schedules referred to in the Act will also admit of modification. Schedule A. implies an examination of the result previous to signature; a schedule in which the date of such examination is distinctly stated, would, in my opinion, be a much more valuable record, and would, to a great extent, if not wholly, prevent the signing of the certificate before the result was known. A very simple modification would suffice, thus:-

Schedule A.

I, the undersigned, hereby certify that ---------- the child of ---------- aged --------- months of the parish of ---------- in the County of ---------- was vaccinated by me on the --------- day of -------; that the arm was inspected on the --------- day of ----------; and that the operation resulted in an efficient vaccination.

Dated this --------- day of --------19 --

(sgd.) ----------

In a similar way Schedule B. infers that some reasonable cause for postponement exists. Why should such cause not be clearly stated on the certificate? At present very trivial causes are sufficient for complying with the wishes of a parent, anxious to gain even one or two months respite, with the result, that, often at the expiry of that time, the condition of the child is not better but worse than formerly, leading to further postponement. Were it necessary to state in every case the cause of postponement I am convinced that in many cases no certificate would be granted. Further, if in the opinion of the Registrar the cause seemed trivial or unsatisfactory, it could at once be brought/

brought under the notice of the medical officer in charge of the district, upon whom I would lay the duty of investigating such cases and reporting thereon. In this way medical practitioners would soon discover that (the) vaccination had ceased to exist in name only, and the fact that their work was supervised by a fully qualified responsible official would act as an incentive to more adequate performance of their public duty.

It is somewhat humiliating to make the admission that the profession requires supervision in the discharge of this duty, but that such is the case will, I am sure, be admitted, by most if not all general practitioners. Fortunately this does not apply to the majority of the profession; but the action of even a small minority may nullify to a considerable extent the beneficent action of the Vaccination Act; and supervision would impose no hardship upon the conscientious majority.

Schedule C. also implies that the operation has been performed three times previous to the granting of the certificate, but why should the practitioner require to possess a knowledge of the Act before granting this certificate, Why should this Schedule be shrouded in obscurity when, without in any way diminishing its efficiency, but rather increasing it, the necessary conditions could be clearly defined? The Schedule should contain spaces for inserting the three dates upon which the operation was performed and also for certifying that in all three cases the operation resulted in failure.

A copy of all certificates granted under this Act should be preserved in full in permanent registers.

What/

What is Efficient Vaccination?

Now lest I also be charged with failure to define terms, let me briefly consider what standard should be adopted for "efficient vaccination", a term which in my opinion is more definite and more likely to lead to greater uniformity of practice than that of "successful "vaccination". These two terms are by no means synonymous, for a single insertion may be perfectly successful, that is, it may produce both local and constitutional symptoms and yet come very far short of efficiency. On the other hand, efficient vaccination necessarily implies successful vaccination - an unsuccessful vaccination could not by any chance be termed efficient. How then is the term efficient vaccination to be defined? For the present purpose the term efficient vaccination is used to denote the operation of vaccination performed in such a way as to secure the greatest possible protection against smallpox, both as regards risk of attack and modification of the disease if and when attacked. It is only by examination of a large number of cases in hospital, in which records of the degree of vaccination have been preserved, that we are able to draw any conclusions as to the method of vaccination which will comply with our definition.

I would therefore invite your attention to the influence of

1. The number of cicatrices as an indication of efficiency: taking as our guide:
   (1) The death rate per cent.
   (2) The character of the Attack.

11. Area of cicatrix as an indication of efficiency: comparing similarly
   (1) The death rate per cent.
   (2)/

(2) The character of the Attack.

First, then, the number of cicatrices, comparing the per centage death rate.

Table I.[1]

No. of Scars.	No. of Cases.	Deaths.	per centage.	
1	95	13	13.7	+ 6.5
2	259	24	9.3	+ 2.1
3	372	21	5.7	- 1.5
4	99	2	2.0	- 5.2
	825	60	7.27	

? 7.27

Note. The last column has been added by me to show by how much each per centage is in excess or defect of the average obtained by taking the total number of (cases and) deaths, the plus sign denoting excess and the negative sign defect. This has been done wherever possible in the subsequent tables.

Table II.[2]

No. of Scars.	No. of Cases.	Deaths.	per cent.	
1	34	-	-	-
2	175	10	5.7	+ 1.2
3	210	-	-	-
4	42	1	2.3	- 2.2
	261	11	4.5	

Note. In this case under two classes no deaths resulted; and if this table alone were considered grave errors might be committed in drawing conclusions. For example, 1 mark seems to afford greater protection than either 2 or 4 and quite as much as 3 marks. Similarly 3 marks would seem to afford greater protection than 4.

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1. Final Report of Royal Commission on Vaccination page 71.

2. Final Report of Royal Commission on Vaccination paragraph 276 page 72.

(Note to table II continued.)

The numbers here are much too small to admit of accurat deductions being made, as I hope to show in my final table under this part.

1./ Table III.

Scars.	Cases	Deaths	per cent.	
1	294	8	2.7	+ 0.9
2	350	12	3.4	+ 1.6
3	401	5	1.2	- 0.6
4	535	6	1.1	- 0.7
	1580	31	1.8	

2./ Table IV.

Scars	Cases	Deaths	per cent.	
1	529	22	4.1	+ 1.2
2	649	22	3.3	+ 0.4
3	518	12	2.3	- 0.6
4	389	6	1.5	- 1.4
	2085	62	2.9	

3./ Table V.

Scars	No. of Cases.	Deaths	per centage	
1	828	63	7.6	+ 2.5
2	1322	93	7.0	+ 1.9
3	1479	63	4.2	- 0.9
4	1125	28	2.4	- 2.7
	4754	247	5.1	

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1. Final Report Roy. Com. on Vaccn. page 74.
2. " " " " " " " 75.
3. " " " " " " " 77.

[1] Table VI.

Scars	Cases	Deaths	per cent.	
1	886	101	11.4	+ 2.3
2	589	43	7.3	- 1.8
3	94	4	4.2	- 4.9
4	74	2	2.8	- 6.3
	1643	150	9.1	

Table VII.

Scars	Cases	Deaths	per cent.	
1	1838	207	11.2	+ 2.7
2	2022	204	10.0	+ 1.5
3	1595	105	6.7	- 1.8
4	1139	45	3.9	- 4.4
	6594	561	8.5	

Note. This table is constructed from the totals of previous tables in order to provide a sufficiently large number of cases from which to draw our deductions with the least possible chance of error; for it is a recognised law of vital statistics that the larger the numbers from which deductions are drawn the less the risk of inaccurate inference. Hence our conclusions must be based upon the facts revealed in this last table if they are to be as reliable as possible.

Four Cicatrices Minimum of Efficient Vaccination.

On examination of these tables we find that the fatality from attack decreases in direct proportion to the number of cicatrices. We also note that the last table containing the largest numbers differs somewhat in/

1. Drs. Thomson & Fullarton, Proc. Roy. Philso. Soc. Glasgow, Vol. 33 page 295.

in its results from the six tables of which it is composed. For the reason given, it is also the most realiable. Thus, as previously pointed out, Table II considered alone is inadequate for drawing inferences from, as the numbers are much too small.

We are, therefore, in accordance with the definition of efficiency previously laid down, bound to accept from the figures furnished by these tables four cicatrices as our standard of efficiency in the Act as it is proposed to amend it.

Number of Cicatrices as a factor in Modifying an Attack.

This factor is also an important one, as a modified attack not only means a saving of life, but also a diminished risk of permanent disfigurement and disablement.

[1] Table VIII.

Scars	Cases	Mild	per cent	severe	per cent
1	95	66	69.4	29	30.5
2	259	205	89.1	54	20.8
3	372	342	91.9	30	8.0
4	99	93	93.9	6	6.0

[2] Table IX.

Scars	per cent Mild.	per cent Severe.
1	66.6	33.2
2	73.8	26.0
3	76.6	23.4
4	88.5	11.3

1. Final Report, Roy. Com. Vaccn. page 71

2. " " " " " " 73

[1] Table X.

Scars	Cases	Mild	per.cent.	Severe	per.cent.
1	294	259	88.0	35	11.9
2	350	323	92.2	27	7.7
3	401	371	92.5	30	7.4
4	535	521	99.4	14	0.5

Here again we observe that severity of attack varies in direct ratio to the number of marks; and the greatest proportion of mild cases occurs when four marks exist as the result of vaccination. For this reason, also, we must accept four marks as the standard of efficient vaccination.

11. Area of Cicatrix as Standard.

Taking

(1) Death rate per cent as our guide.

[2] Table XI.

Area of Scar	No. of Cases	Deaths	per.cent.	
Less than $\frac{1}{3}$ sq. in.	17	1	5.8	+ 4.1
$\frac{1}{3}$ but less than $\frac{1}{2}$	27	1	3.7	+ 2.0
$\frac{1}{2}$ sq. in. & over	246	3	1.2	- 0.5
	290	5	1.7	

[3] Table XII.

Area of Scar	No. of Cases.	Deaths	per.cent.	
under .25	253	6	2.3	+ 0.6
.25 to .5	385	7	1.8	+ 0.1
over .5	702	10	1.4	- 0.3
	1340	23	1.7	

1. Final Report Roy. Com. Vaccn. page 74
2. " " " " " " 72
3. " " " " " " 75

1.
Table XIII.

Area of Scar	No. of Cases.	Deaths	per.cent.	
Under .25	258	50	19.4	+ 10.4
.25 to .5	467	60	13.0	+ 4.0
.5 to 1.0	599	34	5.7	- 3.3
1.0 & over	319	5	1.6	- 7.4
	1643	149	9.0	

Combining now the figures contained in the foregoing tables we get the following:-

Table XIV.

Area of Scar in sq.inches	No. of Cases.	Deaths	per.cent.	
under .25	528	57	10.7	+ 5.3
.25 to .5	879	68	7.3	+ 1.9
over .5	1866	52	2.7	- 3.7
Total	3273	177	5.4	

It may be urged as an objection against the compilation of the above table that the figures in Table XI have been compared with figures which are not strictly comparable. This is quite true for, whereas in Table XI. $\frac{1}{3}$ square inch has been chosen, $\frac{1}{4}$ square inch has been taken in the others. The result however is not seriously affected, as, according to our definition of efficiency, neither the one nor the other can be accepted as a standard. We must choose a cicatrical area over 0.5 square inch in extent.

(2) Character of Attack as guide.

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1. Drs. Thomson & Fullarton, Proc. Roy. Philos. Soc. Glasgow, Vol.33 pages 296 & 297.

1.

Table XV.

Area of Scar in sq. inches	per. cent. Mild.	per. cent. Severe.
under .25	87.4	12.6
.25 to .5	95.4	4.6
over .5	96.1	3.9

2.

Table XVI.

Area of Scar in sq. inches	Discrete	Confluent & Haemorrhagic
under .25	72.5	27.5
.25 to .5	71.0	29.0
.5 to 1.0	86.8	13.2
1.0 & over	89.3	10.7

Note. In this table the terms "Discrete" and "Confluent & Haemorrhagic" are comparable with the terms Mild and Severe respectively.

From these two tables I think we may again conclude that a cicatricial area of over .5 sq. in. must be chosen as our standard of efficiency.

There are thus two Standards.

We have thus two methods by which we may fix our standard of efficiency. On the one hand we may lay down a minimum number of cicatrices; and on the other hand we may define the minimun area of cicatrix which will be accepted as efficient vaccination.

Which of these two should be chosen?

At first sight it would seem that the number of cicatrices/

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1. Final Report, Roy. Com. on Vaccn. page 75.

2. Proc. Roy. Philos. Soc. Glasgow, Vol. 33 page 297.

cicatrices is the one which admits of greatest uniformity and ease of definition; but I am of opinion that uniformity of result would by no means follow. One operator might be satisfied with the production of four minute cicatrices and so keep within the terms of the Act; while another might aim at producing cicatrices larger perhaps than the first operator but not uniform one with another. For example he might make two large and two small insertions.

If, on the other hand, we fix the area of cicatrix as our standard of efficiency, it then becomes a matter of indifference whether such is produced by one, two, three, four, or more cicatrices. Uniformity of result would necessarily ensue, no matter which method of operation be chosen.

Objection to Cicatrical Area as a Standard.

It may, however, be urged that the operation would be performed, the arm inspected, and the certificate signed, before the extent of the scar could be known. This is certainly an objection but not necessarily a serious or fatal one, as it would be possible to state, after careful observation of a sufficiently large number of cases, what extent of surface must be operated upon so as to result in a scar of over one half square inch in extent. Instructions could then be accordingly embodied in the Act. In this way by insisting upon a certain area of skin being operated upon we are really laying down a minimum of cicatrix; and the objection disappears.

The standards therefore which I would accept as complying with the definition of efficiency are:-

(1)/

(1) Four Cicatrices.

(2) An area of cicatrix not less than one half square inch.

As just pointed out I would personally prefer the latter as being more conducive to uniformity of result, but I would willingly accept either as a great advance upon the existing condition of affairs.

Objection to proposed Standards.

Against such standards it would undoubtedly be argued that both are much too high; but can a vaccination err on the side of over efficiency? I think not. When the operation is being performed, does it seriously affect the patient whether three or four insertions are made, or whether the area of surface operated upon exceeds the present by a fraction of an inch? In any case, the present unsatisfactory method has existed too long already, and the sooner we become fully alive to our responsibilities in this matter the sooner will we have made a step in the direction of the prevention of smallpox with all its consequences, direct and indirect; for no case of smallpox can occur in any community without affecting every member thereof, if not directly by increased danger to himself and his dependents, then indirectly, through the expense of isolation of the sufferer, and the maintenance of his dependents during the period of such isolation. And when smallpox becomes epidemic in a district or city, who can estimate the indirect cost of such to any citizen of that place?

The next point I wish to consider is

How could such a Standard be enforced?

Under the existing Act there is no check whatever upon the certificate granted by the operator and nothing short/

short of an actual outbreak of Smallpox reveals the existance of such cases as mentioned in the Memorandum with which these notes open. This is not as it should be, for the mischief is only too often discovered when it is too late to apply any remedy.

In 1872 a law was passed in the Netherlands making[1] admission to school dependent upon the production of a certificate of vaccination.

This method might with advantage be adopted in Scotland, with the additional condition that such certificate be granted by the Medical Officer of the Local Authority responsible for the vaccination of the district in which the child resides. In this way, a check would be placed upon the vaccination of the general practitioner, and, as a consequence, greater uniformity in performance of the operation would result. Not only so but such cases as referred to in the Memorandum would be detected, and, by reference to the Vaccination Register, the practitioner who granted such certificate would be easily discovered, and the threat contained in the closing paragraph of that Memorandum could more easily be carried into execution if so determined upon.

Again, the proportion of children at present unaccounted for would also be diminished. As proving the need for some such supervision, reference to the Final Report of the Royal Commission on Vaccination shows us (para. 137 page 36) that this proportion has increased from 2.7 per. cent. in 1872 to 4.3 per. cent. in 1893.

Finally, another opportunity would be afforded for vaccinating/

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1. Smallpox & Vaccination in Europe, Edwards 1902 page 82.

vaccinating those certified as insusceptible under Schedule C., and there is reason to believe that such vaccination would be successful in a proportion of cases at least. During an epidemic of Smallpox in Coatbridge in 1904, I discovered among the contacts of a case two children who had been certified as insusceptible. In both cases, vaccination produced a satisfactory result. The elder boy was specially susceptible, and was confined to bed for two days by reason of the accompanying constitutional disturbance. He was at that time only seven years of age, and the probability is that, had he been vaccinated at the age of five years, (the age of compulsory attendance at School in Scotland), the result would have been as successful as it was subsequently. Similar cases have been observed by other practitioners during the increased revaccination which always accompanies an epidemic of Smallpox in any town or district.

—Supervision would involve Increased Expenditure.— The method of inspection above referred to would necessarily involve increased expenditure; but, as parents or guardians are compelled (in Scotland at least) to have their children vaccinated, and also to have them educated, they are entitled, I think, to some guarantee that in educating their children they are not unnecessarily exposing them to risk of infection. An unvaccinated, or an inefficiently vaccinated, child is not only a source of danger to himself but to other children also; and, if we insist upon efficient vaccination, it is our duty to ascertain that the Act is duly complied with, not in the majority of cases only, but in every case.

The/

The date of admission to School, then, is in my opinion a most opportune time for such inspection.

Part II.

Revaccination.

I leave now the question of primary vaccination, and would touch but briefly on that of compulsory re-vaccination. On the necessity of revaccination I do not intend to dwell. It is so apparent to any one who has seen anything of Smallpox; and a mere glance at the tables will at once convince the reader that primary vaccination loses, to a great extent at least, its efficiency with the lapse of time.

Of the efficiency of revaccination the details contained in the Final Report of the Royal Commission on Vaccination pages 78 et seq. (too lengthy to admit of quotation) give abundant proof; and, to come nearer home, the facts contained in the Report by[1] Doctors Thomson and Fullarton on the recent Epidemic of Small-pox in Glasgow fully corroborate the advantages so derived. The Commissioners, however, have grave doubts on the advisability of making Revaccination compulsory. The reasons for such misgivings are stated in para-graph 533, page 140, which I quote in extenso.

"We have already adverted to the importance which "we attach to revaccination. It has been suggested "that the operation should be made compulsory by law. "We/

1. Proc. Roy. Philos. Society of Glasgow, Vol. 33.

"We are quite alive to the protective value of re-
"vaccination. At the same time we are not insensible
"of the difficulties necessarily involved in making
"it compulsory. It is, comparatively speaking, easy in
"the case of infants to ascertain whether the law re-
"quiring vaccination has been complied with. The con-
"stant movement of the population would render it more
"difficult to ascertain whether at the more advanced
"age at which it would become applicable, a law provid-
"ing for compulsory revaccination had been observed.
"Again it is impossible to leave out of sight the ef-
"fect such extension of the present compulsory law
"might have in intensifying hostility where it at pre-
"sent exists, and even in extending its area; though,
"if our recommendations, especially that which exempts
"from penalty those who honestly object to the practice
"were adopted this objection would be much diminished.
"After full consideration of the question we are how-
"ever deterred from the considerations to which we
"have adverted from proposing that revaccination
"should be made compulsory. At the same time in view
"of the great importance of revaccination we think it
"should in every way be encouraged. If adequate fee
"were allowed in every case of successful revaccina-
"tion, by whatsoever medical man it was performed, we
"think there would be a large extension of the prac-
"tice. We think steps should be taken to impress on
"parents the importance of having their children re-
"vaccinated not later than the age of twelve years.
"We recommend further that when Smallpox shows signs
"of becoming epidemic special facilities should be
"afforded both for vaccination and revaccination".

It/

It is with great pleasure that I note that two medical members of the Commission dissented from this paragraph. They assert that "in spite of the diffi-"culties as set forth in paragraph 533 a second vacci-"nation at the age of twelve ought to be made compul-"sory".

Let us now examine more closely the contents of this paragraph as it is a very important one. On analysis, we find it is an out-and-out conviction that revaccination is absolutely essential to the prevention of Epidemic Smallpox; with which is coupled the fear or dread of carrying their conviction to a legitimate conclusion. The two medical members referred to alone have the courage of stating the necessity for compulsory revaccination.

——Objections to Compulsory Revaccination.——

The objections indicated in this paragraph are two.

(1) Difficulty in ascertaining whether revaccination has been performed.

(2) The possible extension and intensification of existing hostility.

Let us now briefly consider these in order. Taking then the difficulty of ascertaining whether the law has been complied with. I would ask you in this connection: What are the present means of discovering whether primary vaccination has been successfully performed? In the paragraph just quoted we are informed that this is "comparatively speaking easy". What, I presume, is meant by that statement is that it is easy to discover whether a certificate has been lodged with the Registrar, - a widely different question. If it is/

is so easy, how comes it that cases such as referred to in the Memorandum of The Local Government Board, with which these notes open, are only discovered during epidemics of Smallpox?

At present I know of no other means by which they may be discovered.

Nor is the objection necessarily fatal to compulsory revaccination at the age of twelve years as recommended by the two dissentient Medical Commissioners. The Education Act applicable to Scotland compels School Attendance till the age of fourteen years, so that at the age of twelve years children would be attending School. I have never heard it stated that the "constant movement of the population" had any very serious deleterious effect on the maintenance of Education. I have the authority of a School Board Clerk of nearly 33 years experience that the number of children escaping under the Education Act must be infinitesmal, as he could not remember any cases unaccounted for in a parish having twelve thousand children attending School.

In my suggested Amendment of the Act relating to primary vaccination, I recommended examination for evidence of efficient vaccination of all children previous to their admissiom to school . Why should not a subsequent examination be made at the age of 12 years (i.e. previous to the child's leaving school) for evidence of efficient revaccination? This examination would be conducted by the Medical Officer responsible for primary vaccination in each district.

Again /

Again the[1] German Vaccination Law of April 8th 1874 provides that

"(1) Every Child within the second year of life, also

(2) Every School Child within the twelfth year (unless an attack of Smallpox or successful vaccination has occurred within 5 years previous) must be vaccinated".

I do not suppose that the "constant movement of the population" in Germany is any less than it is in this Country and yet we find that 97 per cent of children are successfully vaccinated and that[2] over 90 per cent are also successfully revaccinated.

Thus we find that in one country at least this objection falls to the ground; and there is no reason why similar results should not be obtained in Scotland also, if the children are examined as suggested.

We pass now to the second objection viz:- the possibility of extending and intensifying hostility to the practice of vaccination. In the first place I would note that this objection is only a hypothetical one. Compulsory Revaccination "might" intensify and extend hostility. As already pointed out in Scotland we do not have "Conscientious Objectors" recognised by law - I do not propose to amend the Act in that respect.

Besides, I question very much if parents would seriously object to a compulsory revaccination. So far as my experience goes the objection at present is not/

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1. Smallpox & Vaccination in Europe, Edwards 1902 page 86.

2. Smallpox & Vaccination in Europe, Edwards 1902 page 91.

not to vaccination as an operation, but, on account of the pain and suffering it is supposed to entail upon an infant of very tender age. The case is totally different with a child of twelve years. By that time he (or she) has passed through the diseases of infancy, and is, on the average, of fairly sound constitution, and therefore in a better condition physically to stand the operation; and finally he does not require the same extra care and attention as a newly vaccinated baby. This last, in my opinion is the most serious objection raised by the average parent to the operation of vaccination.

In this connection, also, I would mention that the report, from which I quote the paragraph at present under observation, contains also the following: "in "Scotland the Vaccination laws have encountered little "opposition, the great majority of the children born "are vaccinated". (para. 518 page 135) Again, as already mentioned, in Scotland only 4.3 per cent of the infants were unaccounted for in 1893, in comparison with 16.1 per cent in England and Wales in the same year.

So far as Scotland is concerned then - and it is only with the act relating to Scotland I am dealing in these notes, - I see no reason why Compulsory Revaccination at the age of twelve years should not be adopted.

In this connection, also, I would adopt the same minimum (as a) standard of efficiency as in primary vaccination; for if a cicatricial area of not less than one half square inch be found to afford the greatest protection in the primary operation, I see no reason why such protection should not be repeated.

Need/

- Need for Standard -

That there exists need for a standard of efficiency is apparent to any one who has seen the cicatrices resulting from the present method of procedure. During the Autumn of 1904, I had the opportunity of examining the vaccination marks of the occupants of a Common Lodging House in Coatbridge in which an epidemic of Smallpox had broken out. I have notes of 231 arms examined. Of these 149 showed evidence of revaccination, classified as follows:-

1 Mark,	93	=	62.41 per cent.
2 Marks,	27	=	18.12 " "
3 Marks,	19	=	12.75 " "
4 Marks,	10	=	6.71 " "

Here I would just like to mention in passing that the percentage of those revaccinated to those once vaccinated or unvaccinated, viz:-

Revaccinated 64.5 per cent.

Once or Unvaccinated 35.5 per cent,

is higher than is usually found in any community and that for several reasons.

In the first place a large number of the occupants of the Lodging House had been in the Army, or at some time or other been imprisoned; in either case, revaccination was a sine-qua-non of admission. Again a considerable number had been occupants of Lodging Houses in Glasgow during the recent Epidemic of Smallpox there. These I know were specially well attended to at that time.

The point however to which I wish particularly to draw attention, is the large proportion of those having/

having one or two marks-constituting 80.35 per cent; while those having three or four marks form only 19.46 of those reveccinated. I regret now that the area of cicatrix was not measured, but I think I am safe in saying that it would not have reached the proposed minimum in 10 per cent. For I would point out that anything in the form of a cicatrix was included in the above classification. This table therefore demonstrates the want of uniformity in the practice of revaccination at present prevailing.

- Army & Prison Revaccination. -

It is surprising that in the Army and in Government prisons no standard of efficiency exists. In some cases one mark, in others two or more resulted from the operation. Nor was there uniformity in size of marks or area of scar. That there is need for such was abundantly demonstrated by the above examination, as some of the Army marks were very poor indeed. The same applies to revaccination in prisons, though, on the whole, they were superior to the operation as performed in the Army. In neither case, however, could there be any excuse for inefficiency as the patient was compelled to submit to the operation on admission.

- Revaccination in Lodging Houses. -

The results of revaccination in lodging houses varied also in the number and area of scars, but, were more efficiently performed. It should however be remembered in this connection that these vaccinations were performed during epidemic Smallpox when a high standard of efficiency was aimed at, and, in many of the best/

best lodging houses in Glasgow revaccination was insisted upon previous to admission. To procure the revaccination of all inmates of lodging houses, they were in many towns offered compensation, monetary or otherwise, in the event of disability for work ensuing.

Lesson of Germany.

As a further argument in favour of compulsory revaccination during school age the condition of Germany may be quoted.[1.]

"Germany has had a quarter of a century of re-
"Vaccination of all School Children, and the result is
"that Smallpox epidemics have long been unknown in
"Germany. In the year 1899, there occurred 28 deaths
"by Smallpox in the German Empire (population
"54,000,000) giving a rate per million = 0.5. These
"28 deaths occurred in 21 different districts (and the
"highest number in any one district was 3), this shows
"that Epidemics cannot get a start in Germany .....
"Thus the result of the law is a brilliant success
"patent to the world".

- Revaccination Fees to be paid by Local Authority -

A fee for each efficient revaccination should also be fixed by the Act and paid by the Local Authority as is at present the custom with notifications of infectious disease. Revaccination of paupers would also be accomplished in a manner similar to primary vaccination. Further, certificates of revaccination should be upon schedules similar to those used for primary vaccination/

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1. Smallpox & Vaccination in Eurpoe, Edwards 1902 pages 86, 88.

vaccination and forwarded in like manner to the Registrar. Arrangements should also be made for supplying at a fixed rate a copy of such certificate as at present is the practice with death certificates. These would then be of some value to the possessor, and after examination by the Medical Officer of the School and countersigned by him would afford valuable evidence of protection from Smallpox.

Government Vaccine Stations.

The final amendment of the Act I would suggest is the establishment of Government Stations for the supply of calf lymph to practitioners. This would guarantee the source of supply and possibly uniformity of potency also. At present there exist so many different stations and the results obtained are by no means uniform. During the outbreak of Smallpox in Coatbridge already referred to I purchased from an Agent six tubes of calf lymph; part of this was used for primary vaccination and part for the revaccination of the inmates of an infected ward of a lodging house. IN EVERY INSTANCE THE RESULT WAS FAILURE. This was a most serious thing in the latter instance as several of the men refused to be vaccinated over again. The infants were of course revaccinated using a different brand and all were successful. Another medical practitioner in the same town had a similar experience with the same lymph. A complaint from the Agent brought in reply a letter from the firm who supplied the lymph, stating that they could not understand the occurrence as the batch complained of was a very large one. It had been tested and found efficient. No other com-

plaints/

complaints had been received. They promised also to make enquiries and report; they forwarded six tubes to replace the inert ones. I had had previous failures with the same brand of lymph and had determined to abandon any further use of it and returned the lymph through their agent. I have not yet heard the result of their enquiries. It may have been the fault of the Agent in not storing the lymph properly, but instructions on that point should have been furnished to him or precautions taken to prevent deterioration. It certainly did not do so in my hands, as my own lymph had given out, and I only wished that lot to complete revaccination of the infected ward. Most of it was used within a few hours of purchase, and the remainder on the following afternoon. Similar examples of failure, unfortunately followed by attack of Smallpox, are recorded by[1] Doctors Thomson and Fullarton, and must have been experienced by all who have revaccinated to any extent during an epidemic of Smallpox.

"Conscientious Objectors"

I will now briefly discuss the question of procedure in the case of a child of a Conscientious Objector in his 12th year. Is he to be compelled to have his child vaccinated or is he to have him expelled from school, in which case he would be liable to prosecution under the Education Act for failing to educate his child? Personally I have no sympathy with such a person as I entirely fail to see how such can possibly exist. I think far too much as been made of/

1. Proc. Royal Philos. Socy. Glas. Vol. 33

of him in this connection. What better right has he to special treatment than the Conscientious Objector to the English Education Act of whom we have heard so much lately? The latter has in my opinion a much more serious and conscientious cause for objection than the former, and yet the treatment meted out differs greatly in the two cases. They are both guilty of breach of the law and should therefore receive the same treatment, be that what it may.

Before deciding this question, I should have liked to have obtained some information as to the procedure followed in Germany which has proved so successful in preventing any serious spread of Smallpox analogous to what has occurred in Britain even in recent years. As my researches however have proved fruitless I fear I must deal with him as a factor who refuses to be ignored.

All such persons should in my opinion be summoned to appear before the SHERIFF of the district in which the School is situated to show reason why his child should be exempted, and only upon his satisfying the Sheriff upon this point would I readmit his child to School.

I have purposely chosen the Sheriff for several reasons. In the first place he is held in higher esteem than a Magistrate or Justice of the Peace. In the second place he is more competent to judge in these matters than the others. Thirdly, the applicant is not likely to be personally known to him, and finally he is a permanent official and not dependent on the vote of the populace for his office.

If/

If such a course be taken in EVERY case I am confident that no appreciable number of children would escape revaccination.

To sum up then; the points upon which I think amendment of the present Act is required are:-

I. A standard of Efficient Vaccination.

II. Transference of Administration from Parochial to Public Health Authorities.

III. Modification of Schedules in the Act.

IV. Provision for payment of fees to Medical Practitioners.

V. Medical Examination of children previous to admission to school for evidence of Efficient Vaccination.

VI. Provision for Compulsory Revaccination at the age of twelve years.

VII. Provision for Establishment of Government Vaccine Stations.

VIII. Procedure in cases of Conscientious Objectors.

Note. I have been compelled to consider the "Conscientious Objector", for, though, at present he is not recognised in the Act relating to Scotland, I fear he would not be excluded from the consideration of any Amended Act, if we are to judge either from the Report of the Commissioners or the recent English Vaccination Act. I have also considered him only under Revaccination, but would adopt like proceedings in the case of primary vaccination were he, unfortunately, to succeed in gaining recognition in both instances.

In conclusion I would direct attention to a few further recommendations of the Commissioners contained in paragraph 533 which I have quoted in extenso on pages/

pages 27 and 28.

The first I would specially notice is that which proposes to "exempt from penalty those who honestly object to the practice" (of vaccination).

This recommendation is put forward as a means to diminish hostility to vaccination and has been embodied in the recent English Act. In what manner it is expected to do so we are not informed. If we remove the compulsion we deprive the Act of a great part of its power. The class amongst whom Smallpox is prevalent know no other argument than fear of penalty. Again as the Education Act has been frequently mentioned, how could this Act be efficiently administered were it not for the penalties attached to breach of its conditions? The fact that each School Board throughout Scotland requires the services of a considerable number of "Compulsory Officers" to enforce the Act shows how utterly powerless it would be without such fear of the penalty attached to failure to comply with its conditions. If people will not voluntarily educate their children, is it reasonable to expect that they will voluntarily have them vaccinated? Again does prosecution of defaulting parents increase hostility to the Education Act? I am convinced that it does not, but that on the other hand it exercises a deterrent effect upon others.

Finally has the "Conscientious Objector" clause increased the number of vaccinations in England? The following figures will I think afford the best answer.

1./ "At/

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1. Practical Guide to the Public Health Acts, F.Whiteside Hime B. A., M. D., London 1901, appendix page 83. (footnote).

"At Keighley 6,227 certificates were granted exempting "15,696 children".

"At Little Dean 700 were granted on December 2nd 1898, "being AT THE RATE OF 87 PER MINUTE during the eight "hours the Court sat".

"At Norwich 1000 were granted December 4th, or al- "together 5,808 for 11,420 children".

But Oldham seems to have surpassed all other towns; there over 27,037 were granted, the exact number being unknown as "NO RECORD WAS KEPT".

This latter statement is made on the highest authority. "THE APPLICANTS THERE USUALLY APPEARED IN COURT PROVIDED WITH AN OFFICIAL FORM WHICH COULD BE PURCHASED AT ANY STATIONER'S FOR A PENNY, and the forms were signed when presented to the Justice and NO ENQUIRY WAS MADE EVEN AS TO THE IDENTITY OF THE APPLICANT OR HIS RELATIONSHIP TO THE CHILD"

I think further comment unnecessary. The parts written in large type will at once show the means taken to identify "those HONESTLY opposed to the practice".

The next recommendation I wish to note is "Re- vaccination should in every way be encouraged". This follows immediately upon the statement that the Com- missioners cannot see their way to make Revaccination Compulsory. In what other manner, I would ask, can revaccination be encouraged? They do not give us any information on this point unless it be the following. "If adequate fee were allowed in every case of suc- "cessful revaccination, by whatever medical man it was "performed, we think there would probably be a large "extension of the practice". Here they would lay upon/

upon the medical profession the duty of endeavouring to rectify the deficiencies of the Act. Why should the practitioner exert himself to procure a greater protection of the populace against Smallpox? In times of peace (so far as Smallpox is concerned) he would have great difficulty in securing any return for labour expended and in times of epidemic Smallpox he has no difficulty in securing a fee - adequate or otherwise - so long as the scare lasts. In every town visited by Smallpox, the Local Authority are only too pleased to grant the fee for revaccination which the Vaccination Act denies.

Again we find the recommendation that "steps "should be taken to impress on parents the importance "of having their children vaccinated not later than "the age of twelve years". By whom is this recommendation to be given effect to? By the medical profession again I presume. Surely there is some limit to the obligations to be imposed upon a long suffering profession. Again I would ask why should the profession take upon themselves the task of endeavouring to rectify all the deficiencies of an Act of Parliament? If the framers thereof can afford to disregard the recommendations of this profession (as was done previous to the passing of The English Vaccination Act in 1898) they cannot surely complain if the profession refuse to regard their recommendations in return, even in the event of "an adequate fee" being held out as an inducement to compliance therewith.

Finally I would ask consideration of the following." When Smallpox shows signs of becoming epidemic "special facilities should be afforded both for vacci- "nation/

"nation and revaccination".

Why should not these facilities exist at other times also? In Germany as already pointed out not only are special facilities afforded but the acceptance of these are insisted upon. Smallpox never shows signs of becoming epidenic there. In this Country on the other hand we have ample opportunity for carrying out this recommendation.

It is most unfortunate that the Country which was the pioneer of Vaccination should thus have fallen behind in the advances made in the methods of controlling Epidemic Smallpox, but I trust that the day is not far distant when the medical profession will realise that their public duty consists not only in fulfilling the legal obligations imposed upon them by Acts of Parliament, but also in rousing the public to the benefits and importance of vaccination as a means of prevention of Smallpox. This can never be accomplished by individual activity. It is only by combined and co-ordinated action that any advance can be made. In this way alone can their claims be forced upon the attention of the framers of our Acts of Parliament, and a counter blow struck at the outcry of the Antivaccinators who at present receive attention altogether out of proportion to their number. So far, the profession who are fully alive to the advantages of efficient vaccination have done nothing in this direction.