A COUNTY B.C.G. CAMPAIGN

BY

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County Sligo has a population of 63,000, and, with the exception of the town of Sligo (population 13,000) and two small towns of 1,000 each, is almost completely rural. There are few industries in the county, the people mostly being divided between agriculture and trade. For the statistical purposes of this article the town of Sligo only has been regarded as urban; the rest of the county is classified as rural.

In common with the other counties of Ireland, Co. Sligo's tuberculosis death rate has been high in comparison with neighbouring countries and those of the Continent, usually averaging around 1 per 1,000. Nevertheless we have resigned ourselves to the fact that for some years our county has had a bad reputation as being a hotbed of tuberculosis: at a London University M.A. examination some years ago one of the subjects for discussion was the abnormally high death rate from tuberculosis prevailing in Co. Sligo.

When, therefore, the National B.C.G. Committee, in January, 1950, made an offer to co-operate with us in Co. Sligo in starting a large-scale tuberculin-testing survey with a view to the introduction of a B.C.G. anti-tuberculosis campaign, it was with some eagerness and still more trepidation that we accepted.

The National B.C.G. Committee was formed in July, 1949, under Government auspices. Its object is to put on a national basis the work which owes its origin to the pioneering spirit of Dr. Dorothy Price, who since 1947 has been successfully vaccinating with B.C.G. at St. Ultan's Hospital, Dublin. Through her years of campaigning and her study of the schemes in use in Sweden, Norway, and Denmark, she finally persuaded the Government to sponsor a national campaign in this country to make B.C.G. vaccination available everywhere.

On its first visit to Co. Sligo, the committee adopted the safer but slower procedure of testing with Moro's ointment, then with 1/1000 old tuberculin, and finally with 1/100 O.T. Even then the negative reactors are not vaccinated lest they should be incubating the disease, but after an interval of six weeks they receive a second maximum test dose of 1/100 O.T., and if this is again negative they receive their B.C.G. vaccination.

We had agreed to start work on three orphanages in the county, and we had also asked a number of medical and other business and professional persons to submit their children for testing with the object of setting a good example for the local population. These numbered 110, and we added 48 contacts of our own tuberculous and suspected tuberculous patients.

A few weeks previous to this we had removed to our local hospital from one of those orphanages a child of 10 with positive sputum, so we were expecting a high degree of infection there, and our fears were realized on finding that, of 171 children from 2 to 16 years, 127 were positive to Moro's test, and of the 44 negative children 24 were positive to 1/1000 O.T. (none of the remaining 20 were positive to 1/100). On subsequent x-ray examination 10% of those reactors were found to have had a recent primary complex (most of them

symptomless); but further investigation by gastric lavage, etc., revealed no other open case, and since this survey and the B.C.G. vaccinations no further trouble has arisen there.

The relative findings for the remaining three centres were as shown in Table I.

TABLE I

	Moro Test		O.T. 1/1,000		O.T. 1/100		Total Pos.	% Pos.
	No.	Pos.	No.	Pos.	No.	Pos.		
Orphanage 2 ..	93	26	67	5	62	1	32	34
3 ..	107	29	78	6	72	1	36	33
Public centre ..	158	15	142	3	127	—	18	11

Excluding No. 1 Orphanage, which was regarded as exceptional, this result was considered satisfactory, and it was arranged that when the time for the vaccination of the first batch was due a second batch would be ready.

This second batch consisted of four secondary and six primary schools, all situated in the town of Sligo. The B.C.G. Committee decided that the slower method should be again adopted, as it was not certain what amount of infection might be encountered.

In all, 1,715 children submitted themselves for examination, and of these 180 were positive to Moro's test, while 108 failed to present themselves for reading; 1,427 were tested with 1/1000 O.T., 162 proving positive and 59 being absent; and of the 1,206 who returned for the final test of 1/100 O.T. 59 were positive, while 55 were absent from reading. This matter of absenteeism from result-reading has complicated the computation of percentages, but the best that could be done to overcome this was to assume that the same percentage of positives would have occurred in the absentees as in those who returned, and to add this percentage to the total of known positives. Thus there were 401 positive reactors, which is 23.3% of 1,715; and as 23.3% of the 222 absentees is 51, we are taking the total positives as being 452. This gives a total proportion of positives as 26.3%. The total figures for this batch are shown in Table II.

TABLE II

Moro Test			1/1000 O.T. Test			1/100 O.T. Test			Totals		% Pos.
No.	Pos.	Abs.	No.	Pos.	Abs.	No.	Pos.	Abs.	Pos.	Abs.	
1,715	180	108	1,427	162	59	1,206	59	55	401+51	222	26.3

When the committee is satisfied that a group or a district is relatively free from infection and that there is little likelihood of children being incubators of infection, a bolder and quicker method is adopted and the entire procedure of testing and vaccination is completed in one week. On Monday the ointment is used on children up to 15 years, or 1/5000 O.T. on those over that age. On Wednesday all non-reactors are tested with 1/1000 O.T., and on Friday all the negative reactors are vaccinated. On Tuesday, Thursday, and Saturday another group of children is completed in the same way. Thus much time and "needling" are saved and this latter method in selected areas has been found to be popular and entirely satisfactory.

As the committee was now satisfied that with regard to the extent of infection the county was not as bad as it was painted, it decided to adopt the quicker method

in subsequent visits, especially as it proposed to extend its activities to the rural parts of the county, where less infection would probably be found, while also finishing off the remaining urban schools. Over a period of four months four further batches of schoolchildren were tested. Propaganda in the Press and from the pulpit was instrumental in inducing people to bring their pre-school and "teenagers" (two extremely important groups from the point of view of anti-tuberculosis work) to swell the number of schoolchildren, and batches of 1,623, 1,080, 1,087, and 1,600 came for examination.

These different batches were completed in the course of four different weeks, as the county health officials had prepared the way during the week preceding the vaccinator's visit by giving the preliminary tests of Moro's ointment or 1/5000 O.T. So the vaccinator completed his work in each series of schools on Monday and Wednesday, Tuesday and Friday, and Thursday and Saturday. To save wearisome lists of statistics the whole six batches have been combined and are given in Table III.

TABLE III

	Moro Test		1/5000 O.T.		1/100 O.T.		Total Pos.	% Pos.
	No.	Pos.	No.	Pos.	No.	Pos.		
Urban ..	3,139	456	1,787	224	2,123	133	813+90	28.6
Rural ..	4,495	217	634	95	3,724	213	525+29	12.3

The whole six batches have been combined again to show the different percentages for the varying age groups, and are shown in Table IV, differentiating between urban and rural districts.

TABLE IV

Age	Urban			Rural		
	No. Tested	Pos.	%	No. Tested	Pos.	%
0-2	85	4	4.7	257	10	3.8
3-5	281	43	15.3	631	50	7.9
6-10	1,010	213	20.0	1,413	141	9.9
11-15	1,279	426	33.3	1,297	160	12.3
16-20	450	192	42.6	608	97	15.9
Over 20	34	25	73.5	289	96	33.2

The statistics in Table IV demonstrate the high degree of infection found in an urban area compared with that found in a rural area even when the urban area is not highly industrialized, and the higher infection rate can only be explained by the more intimate contact inevitably associated with a population living in great numbers in working-class districts and in tenement rooms. Both sets of figures also show that the amount of infection existing in Co. Sligo is no greater than in other areas and that the reputation of the county as a hotbed of tuberculosis is not justified. Some recent figures for infection in other areas are as follows. Holm (Public Health Report, September 6, 1946), in the Danish State Schools in 1942-5, found 14.7% of children infected at the age of 10, 37.7% at the age of 15, and 58% at the age of 20. Rich (1944) estimates that in the United States Registration area 10% are infected at 5 years, 25% at 10 years, 35% at 15 years, and 45% at 20 years. Pointon Dick (1950), with one test only, found 5% positive at 5-7 years, 14% at 8-10 years, 32% at 11-15 years, and 39% at 15-20 years. Scallan (1951), who was one of the hardest workers in our Sligo campaign

for the past year, found 50% of the children infected in a town in another Irish county, as compared with 27% in Sligo town.

B.C.G. Vaccination

B.C.G. vaccination was carried out on 4,750 children and adults who proved negative to all tests; no casualty or accident occurred throughout, and beyond a few sore arms which healed in a very short time there were no complaints. That there were no such complaints or accidents is a proof of the efficiency of the organization and systematic control exercised by the National B.C.G. Committee, which gets regular supplies of the vaccine by air from Sweden every week, and has a very elaborate system of records for each person vaccinated, including data on all results, size of local reaction, amount of erythema, and induration in tuberculin reactions. As these records cover results from all Eire, the Committee is accumulating many valuable data which will be the basis of further research.

For some years past attention has been drawn in our Annual Report to the number of young adolescents returning home from England with established disease, and the opinion has been expressed that the chief cause of this was that they had gone into industrial life while still tuberculin-negative. Our findings during the present campaign go a long way to confirm this, and we have endeavoured, especially in the last few groups done, to persuade as many young adults as possible to be vaccinated before emigrating.

The National B.C.G. Committee has now taken over the entire work in the country and has sent its own team here; it is hoped that every parish in the county will have been visited and vaccination carried out within the next few months.

Discussion

The ultimate result of the vaccination campaign is of course a matter for the future, and benefits attributable to it will be apparent in our statistics only after the lapse of some years. We have complete lists of the children on the various school rolls, and those children who refused or who were absent from vaccination will serve as some sort of a control group to those who were vaccinated. At the cost of a considerable amount of work and trouble on the part of the committee and its officials all the vaccinated have been tested after the lapse of six to eight weeks (the post-vaccinal test) to ensure that the vaccination has been effective, and in cases of failure revaccination has been carried out. The value and importance of the post-vaccinal test cannot be overemphasized. In some cases it has been found that the vaccine has not taken, and in those cases revaccination is necessary. Those persons who have not returned for the post-vaccinal test may be living in a fool's paradise, believing themselves protected against the disease when in reality they can have no certainty of protection. Should they develop disease later the vaccination in their cases will be accounted a failure. In justice to B.C.G. vaccination and to the patients themselves the post-vaccinal test is essential. It is of course proposed to carry out yearly or two-yearly tests to estimate the duration of immunity and to ensure that any who revert to the negative tuberculin state will be given the benefit of revaccination.

Apart altogether from benefits that we believe will eventually be established from the widespread B.C.G.

vaccination, the tuberculin-testing survey has been found of very great interest, and we regard it as of very great help in our ordinary anti-tuberculosis work.

One impression formed during the year is that the tubercle bacillus is not so prevalent or ubiquitous as we had formerly supposed, that when it settles it "stays put," but that where it does "stay put" it invariably makes its presence known by positive reactors in its neighbourhood.

In some rural schools not one single reactor was found, and where schools showed more than an average percentage of positives open cases were present in the area or there was a very strong indication to us to seek the source in the immediate neighbourhood.

From our work during the year we have learnt that in future when we come across a positive reactor it will be our duty to try to trace the source, and, while this may be impossible in the towns, it should be possible in rural areas. We should not, as we formerly did, regard a positive reaction as the expected and universal result, but as an indication that the reactor got his tuberculin sensitivity from an open case of pulmonary tuberculosis; and, if we have no suspicion already about the source, that open case should be located. The younger the reactor the more restricted will be his environment and the more limited the search. In the continued campaign in this county in one week, out of 387 persons aged from 6 months to 35 years 34 reactors to the full series of tests were found. This of course was in a rural area. There has not been time to study this series properly, but for the purposes of this paper a hasty analysis of the data from their record sheets has been made, with some interesting results. Of the 34 reactors three are contacts to already known cases, and nine, all of them with the exception of one 8-year-old over 10 years of age, are isolated cases—that is, one case to each household. In the latter cases there would be very little possibility of tracing the source of infection. The remaining 22 cases are grouped in a significant manner: There are two homes with three reactors and eight homes with two. The age incidence of some of those groups are: $2\frac{1}{2}$ and $3\frac{1}{2}$; 3.7 and 9; 10.6, 13.6, and 16; 7 and 9 years. It is felt that thorough investigation in those homes would be well worth while. Those children have either obtained their sensitivity from an open case in their immediate neighbourhood or they are victims of a bovine infection. In either instance the discovery of the source of the infection should not be impossible in some of these cases. Because of the number of persons over 50 (three of them between 65 and 70) diagnosed as open cases in the last few years, particular attention will be paid to the old bronchitics and chronic coughers who are so common in rural areas. Filming and sputum examination in those cases will, it is thought, pay higher dividends than the mere x-raying of reactors. This was tried fairly extensively last year, with the result that very little treatment was indicated except in the case of very young children. We expect a visit soon from a mass radiology unit, and this should complete a rounded campaign.

It should be said in conclusion that the opinions and impressions noted in this article are personal to me, and are not necessarily shared by the National B.C.G. Committee or its medical personnel.

The grateful thanks of the County Public Health Department are due to the National B.C.G. Committee, St. Ultan's Hospital, Dublin, and their officials, Dr. J. St. P. Cowell, Medical Director,

Dr. P. Alston, and Dr. B. Scallan, who of course are responsible for all the work detailed above, the writer acting merely as organizer and enthusiastic supporter. Thanks are also due to Dr. Michael Kirby, County Medical Officer of Health, for permission to publish this article, to Dr. Kirby and Dr. Cowell for generous co-operation in compiling it, and to our nursing and clerical staff, on whom the heavy work of the whole county campaign fell.

ADDENDUM.—Since the preparation of this paper the committee has completed its programme for the county, and its members have visited every district and school. In all, 11,786 children under 15 years of age have been tested. Of these, 10.9% were positive, and 8,735 were vaccinated. 2,616 persons over 15 years old were tested. Of these, 28.9% were positive and 1,364 were vaccinated. A small portion of those vaccinated have not yet had a post-vaccinal test, but of those who have had it 95% were positive after the six-weeks or eight-weeks interval: these of course were revaccinated. For the purposes of this paper a small number of cases (140) vaccinated in March, 1950, were tested after 15 months' interval, and 97% of these were still positive. A complete list of all positive reactors in the different dispensary areas has been circulated to the medical officers concerned, and especial attention drawn to households with two or more cases. This knowledge should prove of great value to the doctor in future dealings with his district.

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CONGENITAL DUPLICATIONS OF THE SMALL INTESTINE

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Duplications of the small intestine are uncommon, and may be of spherical or tubular shape. The spherical cyst must be distinguished from a Meckel's diverticulum, which is due to the persistence of the vitelline duct, and from other minute diverticula. These arise from the epithelium lining the intestine, and grow into the sub-epithelial connective tissue, and come to lie principally on the antimesenteric side of the intestine. The spherical duplication cysts are situated between the layers of the mesentery, on the mesenteric side of the intestine. These cysts must also be distinguished from the thin-walled mesenteric cysts of lymphangiomatous origin, whereas the duplication cysts have thick walls containing all layers of the small intestine. The former can be separated easily from the small intestine, and the latter only with difficulty.

Summaries of recorded cases have been made by Nor-mark (1937), and by Bremer (1944), and Ladd and Gross (1940) described a series of 18 personal cases. Recently Wooller (1950) described one case of the cystic type, and Aitken (1950) recorded a very rare case of duplication of the intestine from a Meckel's diverticulum to the anal canal.

Two cases of this condition have been operated upon in the Leicester Royal Infirmary in the last five years, one being of the tubular type, and one of both cystic and tubular type. Dr. E. M. Ward, the senior pathologist,