MORE THAN 500,000 German children have been given tests in the US Zone during the past 15 months as a precaution against the danger of tuberculosis. Those who showed the need for it—nearly 200,000 children in all—were vaccinated against the disease.

This accomplishment was the work of the Danish Red Cross, with the cooperation of the US Military Government and German public health officials. Dr. Svend K. Svendsen, in charge of the program, and Dr. Johannes Holm, director of the Denmark State Serum Institute, assisted actively in carrying out the project.

In the spring of 1947 the State Serum Institute of Denmark, together with the Danish Red Cross, offered to assist in tuberculosis relief programs in several European countries. The offer was made to German public health officials and physicians by Dr. Holm and by Dr. Herman Hilleboe of the US Public Health Service. These tuberculosis specialists visited all the states in the US Zone of Germany during the late summer of 1947.

At these initial meetings, German representatives, remembering the Luebeck catastrophe, made it clear that some resistance against a vaccination program could be expected from German physicians. Both Danish and American authorities emphasized that a testing and vaccination program in Germany must be entirely voluntary.

FOR A MASS vaccination program, it is necessary not only to have experience in the organization of the program, in the technique of tuberculin testing, and application of the vaccine, but also to have a vaccine that has been carefully tested in the laboratory and tried out in the field. The Danish government, through the Danish Red Cross, offered to provide the vaccine and personnel to supervise and assist in a voluntary vaccination program in Germany.

At later meetings, German public health officials agreed that conditions warranted the carrying out of an immunization program and decided to accept the offer of the Danish Red Cross to conduct such a program.

The vaccine was prepared by the Danish Red Cross from a strain of tubercle bacilli isolated in Denmark. The vaccine was sent to the states of Germany and was used throughout the US Zone.

IN ORDER to understand the importance of the mission’s work the reader should know the answer to such questions as: What is tuberculin? What is a tuberculin test? And what is BCG?

Tuberculin was discovered by Robert Koch in 1899. His product, now called “Old Tuberculon,” may be considered the foundation for modern tuberculin testing methods. Tuberculon has the peculiarity of giving a specific reaction when it comes in contact with the body fluids of an individual who has been infected with tubercle bacilli; however, it gives no reaction when it comes in contact with a person who has had no tuberculous infection. The potency of tuberculin is measured in TU (tuberculin units).

OMG Hesse provided a base from which the Danish Red Cross teams could operate and arranged for housing for the personnel of this Danish mission. OMGUS arranged for a fund of $5,000 with which the teams could meet dollar expenses necessary for the execution of the program begun in Germany in the early fall of 1947. The extent of the work accomplished by the mission by Jan. 1, 1949 is summarized in the following table.

### Table: Number of Persons Tuberculin Tested and Vaccinated with BCG in US Zone

<table>
<thead>
<tr>
<th>Area</th>
<th>Tested</th>
<th>Vaccinated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berlin (US Sector)</td>
<td>469</td>
<td>86</td>
</tr>
<tr>
<td>Bremen</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Bavaria</td>
<td>25,603</td>
<td>15,578</td>
</tr>
<tr>
<td>Hesse</td>
<td>474,768</td>
<td>142,289</td>
</tr>
<tr>
<td>Wuerstenberg-Baden</td>
<td>23,334</td>
<td>15,825</td>
</tr>
<tr>
<td>DP’s (US Zone)</td>
<td>63,819</td>
<td>14,877</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>588,103</td>
<td>188,733</td>
</tr>
</tbody>
</table>

German girl is given Mantoux test. (right) Reading after 72 hours: red spot indicates individual is positive "reactor" and does not need to be vaccinated.

(Photos from OMGH)

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In a tuberculin test, the tuberculin is brought into contact with an organism in such a manner as to create the possibility of a reaction between the tuberculin and anti-bodies which may be present in the organism. This contact can be established in different ways; however, in all tuberculin tests, a positive reaction shows that the individual has been infected with tubercle bacilli. The most common test methods are known as the Moro test, the Mantoux test and the Pirquet test.

The Moro-patch test is similar to other patch tests for allergy. A small amount of a standardized tuberculin ointment, of approximately match-head size, is put on the skin of the chest and covered with adhesive plaster. After 24 hours the plaster and ointment are removed; three or four days later the reaction to this test is read by a competent medical authority.

The Mantoux test is probably the most exact of the tuberculin tests. In this test method a standardized dose of diluted tuberculin is injected intracutaneously. The reaction is read on the third or fourth day after this injection.

A “reactor” is a person with a positive tuberculin test. The reaction between the injected tuberculin and the anti-bodies already present in the tested individual is a sign that the person has been previously exposed to a tuberculous infection and already has developed through a natural infection sufficient anti-bodies to give him partial protection or immunity.

“Non-reactors” to a Mantoux test of 10 tuberculin units are considered never to have been infected, or to have had a tuberculous infection so long ago that they either have no anti-bodies or too few to give any real protection against tubercle bacilli. These non-reactors need to develop more anti-bodies against tubercle bacilli, and the production of these anti-bodies can be stimulated by the BCG vaccine.

Tuberculin tests are given before vaccination to divide the population into two groups: Reactors or non-reactors. Reactors to specified tuberculin tests would not benefit from vaccination. Therefore, only persons having a negative reaction, the non-reactors, are given a BCG vaccination.

Vaccination against tuberculosis has been used in recent years to a steadily increasing extent. A vaccine was developed by Calmette, who began growing a special strain of tubercle bacilli on special culture media in 1908. This vaccine, named BCG (Bacilli-Calmette-Guerin), was first used on humans in Paris in 1923 in accordance with instructions from Calmette.

At first the vaccine was administered orally to newborn children. In 1927 the intracutaneous method of administration was introduced, and later this procedure was adopted as the standard method for BCG vaccination. It is generally accepted that through a natural infection with tubercle bacilli, the infected person develops anti-bodies which generally are sufficient to protect the individual against a later infection. However, even though the majority of tuberculous-infected individuals obtain protection without disease through a natural infection, the risk is too great. The same protection can be given in a controlled manner by BCG vaccination. By vaccinating non-reactors, they can be changed into reactors in 98 to 99 percent of the cases.

The success of the voluntary program in Hesse can be attributed to Dr. Svendsen and his staff and to the support which has been given the campaign by physicians, particularly German public health officials. Dr. Svendsen permitted the campaign to proceed slowly; he held many conferences and forums on the subject with small groups of physicians and laymen; he demonstrated testing techniques and vaccination procedures, and patiently waited for the program to gain momentum as a result.

During the school summer recess of 1948, the Danish mission devoted its time to a testing and vaccination program in DP camps, with 63,819 displaced persons tested.

The tuberculin testing and BCG vaccination campaign is now complete in Hesse. In January the Danish Red Cross Mission moved from its base in the Wiesbaden-Schlangenbad area, and in the future will concentrate operations in Bavaria and Wuerтемberg-Baden. Future work in Hesse will be done by German physicians who have been supervised and trained during the past year by the Danish specialists.

Final data is not available from all the counties in which the work has been completed; however, a preliminary analysis of data from 18 counties in Hesse, representing 45 percent of the population, shows that 34.8 percent of all children (age 6 to 14 years) examined were positive reactors. Positive reactors in this group (168,000 children) ranged from 20.9 percent in six-year-olds in rural

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