Microscopic Counts of Mycobacteria
Conversion Factors for the Pinhead Method

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One merit of the pinhead method (1) of transferring microsamples of bacteria to glass slides is the rapidity with which large numbers of samples can be placed on each slide. The system assures identical staining, differentiation, and rinsing of eight samples per slide. Nakayama et al. (2) reported the standard deviation between volumes per pinhead to be 7.4 per cent and concluded that the method is more practical and convenient than other available procedures.

With precautions to avoid atypical or defective films (see 1, PROCEDURE), the degree of reproducibility is further improved.

A unique feature is that conversion factors can readily be calculated for any microscope, thus eliminating all the problems of calibration. The method of counting and the derivation of conversion factors have already been described (1).

With any given microscope, the number of fields observed per diameter of some films may be one less (or one more) than the average. For example, with a system and a microscope that usually yields 30 fields/film diameter, the number observed will sometimes be 31 or 29 fields. If one regards the average diameter as 30 fields and uses the corresponding conversion factor, the estimates are somewhat less accurate than when a conversion table is used that shows the factors for 29, 30 and 31 fields. Furthermore, I find that some persons are not adept at calculating conversion factors for different situations or different microscopes.

The accompanying Table of Conversion Factors, therefore, has been prepared to eliminate inconvenience or errors in calculation. To convert the number of bacilli observed/film diameter to bac/ml., three points of information are essential:
1. The number of fields observed/diameter.
2. The number of bacilli counted/diameter.
3. The corresponding Conversion Factor.

PROCEDURE
1. Select the Conversion Factor that corresponds to the number of fields and counted/diameter.
2. Multiply the number of bacilli seen/diameter by this factor.

Examples:

<table>
<thead>
<tr>
<th>Fields counted/diameter</th>
<th>Conversion Factor</th>
<th>If bacilli seen/film</th>
<th>Bac/ml.</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>0.75</td>
<td>750</td>
<td>175</td>
</tr>
<tr>
<td>30</td>
<td>0.21</td>
<td>750</td>
<td>158</td>
</tr>
</tbody>
</table>

The Conversion Factors employed in the examples above assume a 1:5 dilution of sample, which is usual in standardizing lepromin. In other types of experimental work, we correct the estimated bac/ml. for the actual dilution of sample.

The Conversion Factors shown apply only to pinheads that transfer 0.00056 ml/film. The recommended pins (1) are widely available. We can supply a modest
The pinhead method of enumerating mycobacteria and other particles permits the preparation of approximately 30 films per minute, and does not require calibration of the diameters or areas of microscopic fields. This paper provides a table of conversion factors that yields the millions of bacteria per milliliter, irrespective of the number of microscopic fields counted per film diameter.

**SUMMARY**

The pinhead method of enumerating mycobacteria and other particles permits the preparation of approximately 30 films per minute, and does not require calibration of the diameters or areas of microscopic fields. This paper provides a table of conversion factors that yields the millions of bacteria per milliliter, irrespective of the number of microscopic fields counted per film diameter.

**REFERENCES**