COMMON COLDS AS A POSSIBLE SOURCE OF CONTAGION FOR LOBAR PNEUMONIA.

By EUGENIA VALENTINE.

(From the Bureau of Laboratories of the Department of Health of the City of New York, New York.)

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The pneumococcus has been assumed to be one of the causative agents in common colds because of its known pathogenic character and because of its predominance in the mucous discharge in some cases. As far as we know, determination of the types of pneumococcus encountered in these conditions has not been made except in as far as the Pneumococcus mucosus type was identified on cultural grounds. For this reason, a series of common colds was examined to determine the types of pneumococci present. This was undertaken not so much from the standpoint of determining the etiological significance of pneumococci in common colds, but rather to determine whether the fixed types occurred. If these were found, common colds would then have to be considered as a source of infection in the spread of lobar pneumonia.

By injecting the nasal secretion or sputum into mice, pneumococci were recovered in 37 out of 65 cases of common colds. By direct plating on blood agar, pneumococci were found in 6 additional cases. Of the total 43 cases, the incidence of type or group of pneumococcus recovered was as follows: Group I, 2 cases; Group II, 2 cases; Group III, 4 cases; Group IV, 35 cases. The cases from which Group II was isolated and one of the Type III cases had been in contact with pneumonia and, with the data available, it is impossible to decide whether they were merely contact carriers or whether the cold was an actual infection by pneumococci due to contact with the pneumonia cases. None of the other cases from which fixed types were isolated had any such contact as far as could be determined.

In determining the type, immune horse sera were employed. Con-
siderable agglutination was encountered with either or both of the
horse sera (Type I and Type II) in low dilutions with the strains
finally included in Group IV. In the cases where this was marked,
further agglutinations were done with rabbit sera which did not give
these aberrant reactions, to eliminate the possibility that some of the
strains belong to subgroups of the fixed types as described by Avery.\(^1\)

Table I gives the results of the tests and shows conclusively that the
irregular reactions with the horse sera were due to non-specific agglu-
tinins. Two of the Group IV cultures, C 3 and C 5, show some de-
gree of relation in their cross agglutination.

### Table I.

<table>
<thead>
<tr>
<th>Type or group</th>
<th>Case cultures</th>
<th>Rabbit sera</th>
<th>Type I</th>
<th>Type II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>C 1</td>
<td>C 3</td>
<td>C 5</td>
</tr>
<tr>
<td>IV</td>
<td>C 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>C 2</td>
<td>400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>C 3</td>
<td></td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>C 4</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>C 5</td>
<td>300</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>C 14</td>
<td></td>
<td></td>
<td>600</td>
</tr>
<tr>
<td>I</td>
<td>C 20</td>
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<td>600</td>
</tr>
<tr>
<td>I</td>
<td>Control strain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>&quot;</td>
<td></td>
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</tr>
</tbody>
</table>

In three of the four cases yielding Type III, mouse inoculation only
was done, so that no data are available on the preponderance of this
organism. In the fourth, direct cultures showed the presence of
about 75 per cent of this organism. The data available, therefore,
except in one instance, are merely an indication that the catarrhal
inflammation was due to this type. *Pneumococcus mucosus* has been
found by other observers in the secretions of the respiratory tract in
conditions other than lobar pneumonia, as well as in otherwise normal
individuals. All these individuals, therefore, must be looked upon
as potential sources of infection for others or as sources of possible
autogenic cases of lobar pneumonia.

The recovery of pneumococci of Type I from two cases of common
colds raises the question whether these persons were carriers or

\(^1\) Avery, O. T., *J. Exp. Med.*, 1915, xxii, 804.
whether the inflammation was due to the pneumococcus. Both cases were markedly prostrated and had a temperature of 102° F. In both cases direct plates showed that the Type I pneumococcus constituted at least 75 per cent of the organisms developing from the secretion, which strongly suggests that the pneumococcus was the etiological agent. If this deduction is correct, we must add some cases of common cold to the already known sources of contagion for lobar pneumonia; namely, the actual case of pneumonia, the convalescent, and the contact carrier (Stillman\textsuperscript{2}). One of these cases was reexamined by mouse inoculation whenever a cold recurred over a period of over 2 years. The first reexamination, done a year later, yielded a few Type I pneumococci, most of the organisms in the mouse peritoneal cavity being Pneumococcus Type IV and the bacillus of Friedländer. This shows that the individual was still a carrier of Type I, the small numbers of this organism recovered indicating that it was not of etiological significance in this cold. Subsequent examination for a period of a year, the first a month later, yielded only Pneumococcus Type IV.

**SUMMARY.**

In two instances of common colds, with no known contact with cases of pneumonia, Pneumococcus Type I was found to be the predominating organism, which strongly suggests that it was the etiological agent in these colds. If this is so, common colds of this type must be looked upon as a possible source of contagion in the development of lobar pneumonia due to the Type I pneumococcus.

\textsuperscript{2}Stillman, E. G., *J. Exp. Med.*, 1916, xxiv, 651.