**Rickturnerite**  
\( \text{Pb}_7\text{O}_4[\text{Mg(OH)}_4](\text{OH})\text{Cl}_3 \)

**Crystal Data:** Orthorhombic.  
**Point Group:** 2\(\text{m}\) 2\(\text{m}\) 2\(\text{m}\).  
As mats, to 16 mm, of flattened fibrous crystals.

**Physical Properties:**  
**Cleavage:** Indistinct.  
**Fracture:** Splintery.  
**Tenacity:** Brittle.  
Hardness = \(\sim 3\)  
VHN = 140 (100 g load).  
D(meas.) = n.d.  
D(calc.) = 6.886

**Optical Properties:**  
**Color:** Pale emerald green, gray in reflected light with abundant greenish gray internal reflections.  
**Streak:** White.  
**Luster:** Vitreous.

**Optical Class:** n.d.  
\(n = 1.38\) [calculated]

R\(_1\)-R\(_2\): (470) 14.9-15.7, (546) 13.8-14.4, (589) 13.6-14.2, (650) 13.4-14

**Cell Data:**  
**Space Group:** Pn\(_{ma}\).  
\(a = 5.8034(5)\)  
\(b = 11.3574(9)\)  
\(c = 12.9393(16)\)  
\(Z = 8\)

**X-ray Powder Pattern:** Torr Works (Merehead) quarry, England.  
6.474 (100), 3.233 (73), 2.867 (57), 5.636 (44), 3.112 (31), 2.635 (25), 4.287 (20)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PbO</td>
<td>87.70</td>
<td>90.31</td>
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<tr>
<td>MgO</td>
<td>1.79</td>
<td>2.33</td>
</tr>
<tr>
<td>CuO</td>
<td>0.14</td>
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<tr>
<td>Cl</td>
<td>6.62</td>
<td>6.15</td>
</tr>
<tr>
<td>H(_2)O</td>
<td>[2.27]</td>
<td>2.60</td>
</tr>
<tr>
<td>-O=Cl(_2)</td>
<td>1.50</td>
<td>1.39</td>
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<tr>
<td>Total</td>
<td>97.02</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) Torr Works (Merehead) quarry, England; electron microprobe analyses, H\(_2\)O calculated from structure analysis; corresponding to Pb\(_{7.16}\)Mg\(_{0.81}\)Cu\(_{0.03}\)Cl\(_3.04\)H\(_4\)O\(_{8.60}\)·1.15H\(_2\)O.

(2) \(\text{Pb}_7\text{O}_4[\text{Mg(OH)}_4](\text{OH})\text{Cl}_3\).

**Occurrence:** Part of an assemblage of lead oxychloride minerals that occur in cavities in manganese oxide pods in limestone.

**Association:** Mereheadite, cerussite, calcite, aragonite, mimetite, hydrocerussite, “plumbonacrite,” manganite, pyrolusite, and an uncharacterized lead oxychloride.

**Distribution:** From the Torr Works (Merehead) quarry, near the village of Cranmore, England.

**Name:** Honors Rick Turner, geologist and mineral collector, who collected the first specimens.

**Type Material:** Natural History Museum, London, England (BM 2008,100).

**References:**  